A Maternal and Child Health Program Outcome Evaluation Study: Examining the Effect of a Targeted Village Birth Attendant Program in Papua New Guinea

By

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of this thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

______________________
Julie Kep Kamblijambi

30 November 2015
Acknowledgements

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This thesis was edited by Elite Editing, and editorial intervention was restricted to Standards D and E of the *Australian Standards for Editing Practice*.

I dedicate my thesis to the Kambljambi and Kep family: ‘My achievement is your achievement’.
Abstract

Title


Background

The World Health Organization’s (WHO’s) (2011) ‘right to health’ mandates that a safe birth is the right of every woman, regardless of context. As a low-income country, Papua New Guinea (PNG) has the highest rate of maternal mortality in the Asia Pacific region—reported in 2008 to be 733 deaths per 100,000 live births (WHO, 2010).

Aim

The aim of this research was to conduct a modified retrospective program evaluation of a PNG university’s Bachelor of Clinical Maternal and Child Health (BCMCH) curriculum. Specifically, this study examined how knowledge and clinical skills were transferred sequentially from the BCMCH nursing students to village birth attendants (VBAs) and village child health workers (VCHWs), and then to rural women. A secondary aim was to provide contemporary empirical data to the PNG Department of Health to inform a new model for maternal and child health nursing higher education programs.

Design

The sequential four-phase descriptive exploratory design used a retrospective approach. The first phase consisted of a formal curriculum mapping exercise of the previous University A¹ BCMCH curriculum for 2005 to 2009. The second and third

¹ For privacy reasons, the university studied in this thesis is referred to as ‘University A’ throughout this document.
phases included purposive sampling of BCMCH graduates from the same programs, which was matched with purposive sampling of VBAs and VCHWs directly trained by the graduates. The fourth phase recruited snowballed sampling of rural postnatal women, who had been delivered or attended to by the same VBAs and VCHWs.

**Data Collection**

Data collection occurred between January and August 2013 in two purposively sampled PNG areas—highlands and coastal regions. In Phase 1, a curriculum module analysis was conducted on University A’s curriculum. In Phase 2, a total of 16 face-to-face interviews were conducted with BCMCH graduates. During Phase 3, focus group discussions were held with VBAs and VCHWs. During Phase 4, a total of 10 face-to-face interviews were conducted with postnatal women in both regions.

**Data Analysis**

This research undertook documentary analysis employing curriculum mapping for Phase 1, and thematic analysis for Phases 2, 3 and 4. All interview guides for Phases 2, 3 and 4 were piloted before conducting each phase, and necessary modifications were made. Rigour was established by audio taping, content validity and member checking. Triangulation was employed to examine the convergent and divergent themes that arose during all phases of data collection.

**Key Findings**

The findings from the population samples (Phases 2, 3 and 4) indicated concurrent agreement, in which University A’s BCMCH graduates felt that they were able to provide more valued care when educationally prepared to understand the sociocultural environment of the villages in which their clients lived, and could more clearly articulate their clinical practice. This curriculum knowledge was transferred to women in the community through the targeted training of VBAs and VCHWs.
However, this research also highlighted the paucity of educational and clinical resources available during the participants’ education.

The VBAs and VCHWs felt that their training enabled them to identify high-risk factors in women and ‘too sick’ signs in children. This acquired knowledge enabled the initiation of timely hospital referrals during pregnancy and childbirth. The community health education component was seen to result in positive public health outcomes for rural families and communities.

The rural postnatal women stated that they had received new knowledge from the BCMCH-trained VBAs and VCHWs regarding preparing for giving birth, which improved their past practices of delivering a baby unassisted. They also gained new knowledge on human immunodeficiency virus (HIV) infections, and family planning.

**Recommendations**

Based on its findings, this research recommends developing a new PNG postgraduate maternal and child health curriculum, with a substantial component focusing on VBA and VCHW education, and community health practice. This research also recommends ensuring sustained learning resources are provided for both tertiary educational and clinical facilities. A critical component of the new curriculum should be using evidence-based public health interventions and practicum village placements.
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<table>
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<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>BCMCH</td>
<td>Bachelor of Clinical Maternal and Child Health</td>
</tr>
<tr>
<td>CHEAN</td>
<td>College Human Ethics Advisory Network</td>
</tr>
<tr>
<td>FGP</td>
<td>Focus Group Participant</td>
</tr>
<tr>
<td>HEO</td>
<td>Health Extension Officer</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
</tr>
<tr>
<td>KRA</td>
<td>Key Result Priority Area</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
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<tr>
<td>MMR</td>
<td>Maternal Mortality Rate</td>
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<tr>
<td>NGO</td>
<td>Non-government Organisation</td>
</tr>
<tr>
<td>OHE</td>
<td>Office of Higher Education</td>
</tr>
<tr>
<td>PHA</td>
<td>Provincial Health Authority</td>
</tr>
<tr>
<td>PNG</td>
<td>Papua New Guinea</td>
</tr>
<tr>
<td>PNGMRAC</td>
<td>Papua New Guinea Medical Research Advisory Committee</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually Transmitted Infection</td>
</tr>
<tr>
<td>TBA</td>
<td>Traditional Birth Attendant</td>
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<tr>
<td>ULO</td>
<td>Unit Learning Outcomes</td>
</tr>
<tr>
<td>UNFPA</td>
<td>United Nations Fund for Population Activities</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations International Children’s Emergency Fund</td>
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<tr>
<td>US</td>
<td>United States</td>
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<tr>
<td>VBA</td>
<td>Village Birth Attendant</td>
</tr>
<tr>
<td>VCHW</td>
<td>Village Child Health Worker</td>
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</table>
WHO World Health Organization
Glossary of Key Terms

Child mortality: the number of deaths of children aged less than five years, per 1,000 children who live (WHO, 2010).

Curriculum: ‘a formal plan of study that provides the philosophical underpinning goals and guidelines of a specific education program’ (Keating, 2011, p. 1).

Infant mortality: death that occurs in the first year of a child’s life (WHO, 2013).

Low- to medium-income countries: countries with a gross national income (GNI) of less than $1,045 per capita for low income and above for medium income, but less than $12,746, calculated using the World Bank Atlas method (World Bank Group, 2015).

Maternal mortality rate: death of women while pregnant or within 42 days after giving birth, irrespective of duration of pregnancy, the site of pregnancy and causes related to or aggravated by pregnancy and its management, yet not from accidental or incidental causes (WHO, 2014a).

Midwife in the PNG context: a person who has successfully completed a postgraduate midwifery education program duly recognised in a country in which it is located, or successfully completed a prescribed course of study in midwifery and acquired the requisite qualification to be registered and/or legally licensed to practice as a midwife (National Department of Health, 2015)

Nurse in the PNG context: a person who has completed three years of a basic nursing certificate or diploma program, achieved an institutional academic award and completed the required set competencies ((National Department of Health, 2015)

Perinatal mortality: the sum of neonatal and foetal deaths (still births) per 1,000 people in a given population (WHO, 2010).

Skilled birth attendants: is an accredited health professional such as midwife, doctor or nurses who had undertaken midwifery skill as part of their studies to pro- efficiency
manage uncompleted and complicated pregnancy, childbirth and postnatal women (WHO, 2004).

**Social determinants of health**: the conditions in which people are born, grow, live, work and age, as shaped by the distribution of money, power and resources at global, national and local levels (WHO, 2015b).

**Traditional birth attendants**: WHO defines traditional birth attendants as people who are usually female and over 40 years of age, who assist mothers during childbirth. They initially acquire skills by delivering their own children, or through apprenticeships; they are not formally trained (Kruske & Barclay, 2004; WHO, 2004).

**Village birth attendant**: in the regional Asia Pacific context, these are woman in the community—whether married, single, literate or illiterate—who are recognised and appointed by the community leader to represent women in the community and undertake training as village birth attendants to support women during pregnancy and childbirth (Alto, Albu & Irabo, 1991).

**Village child health workers (volunteers)**: village-based health workers who are trained in a health-related field, such as child health or village health, and who undertake a role in that field, often as a volunteer.

**Village Councillor in PNG context**—is a local government representative elected by the people in the community to represent them in the local or government issues.
Chapter 1: Introduction and Background

1.1 Introduction

This chapter provides an overview of this research, commencing by discussing the background of maternal and infant morbidity and mortality from a global perspective, followed by discussing the regional (Pacific) and local (Papua New Guinea) contexts. This chapter then provides a relevant socio-demographic profile of Papua New Guinea (PNG). This is followed by a critique of how maternal and infant mortality has affected the livelihood of the PNG population. This chapter then further outlines the purpose and aims of this study, identifies the research questions and addresses the study’s significance, before concluding with an overview of the proceeding chapters.

1.2 Maternal and Infant Morbidity and Mortality Globally

Maternal and infant morbidity and mortality is a global health concern that contributes to the long-term burden of disease of a given nation. In 2000, the leaders of the 193 United Nations member states and 23 international organisations agreed to develop goals to help alleviate poor maternal and infant outcome indicators that contribute to the burden of disease in their countries. Eight main goals and 21 targets were developed, with target dates set between 2000 and 2015 (United Nations, 2013 World Health Organization [WHO], 2010, 2011). These goals were to eradicate poverty and hunger; achieve universal primary education; promote gender equality; reduce child mortality; improve maternal health; combat human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), malaria and other diseases and ensure a sustainable environment (United Nations, 2010). Specific to these goals were the following targets:
Millennium Development Goal (MDG) 4—to reduce the mortality rate of children under five years of age to 66%

MDG 5—to improve maternal health by reducing maternal mortality by 75%.

The underlying aim of MDGs 4 and 5 was to strengthen a given country’s healthcare systems by increasing the proportion of births attended by health professionals and skilled birth attendants by 2015 (WHO 2004).

In 2013, it was estimated that, globally, 1,500 women died from pregnancy or childbirth-related complications each day (WHO, 2014a). However, there was a notable reduction from 380 maternal deaths per 100,000 live births in 1990 to 210 maternal deaths per 100,000 live births in 2013 (WHO, 2014a). Unfortunately, this decline was only half of the target aimed for in the MDGs, with large maternal and infant morbidity and mortality disparities still existing between high- and low-income countries (United Nations Children’s Fund [UNICEF], 2013). In 2013, it was also reported that the risk of maternal deaths was one in 4,000 in high-resource countries—such as Ireland, Australia, the United States (US) and other European countries—compared to one in 51 in low-resource countries (WHO, 2014a). Countries such as Sierra Leone, Afghanistan, Malawi and other African countries recorded at least 1,000 maternal deaths per 100,000 live births (WHO, 2010, 2011, and 2014a). When comparing WHO regional statistics on maternal mortality; the African and Asian regions had the highest reported mortality, ranging from 500 (in Sub-Saharan Africa) to 190 (in Southern Asia) per 100,000 live births, compared with six maternal deaths per 100,000 live births in high-income countries (WHO, 2014a).

The major causes of maternal deaths are preventable conditions, such as postpartum haemorrhage, hypertensive disorders, sepsis and abortion, while 85% of
newborn mortality is due to pre-term and birth asphyxia (Karlsen et al., 2011; Say et al., 2014; Tuncalp et al., 2015). These causes of maternal death are underscored by the social determinants of poor nutrition, shortage of skilled health professionals, inadequate supply of medical equipment, and distance or transportation obstacles to accessing formal healthcare (Karlsen et al., 2011; UNICEF, 2013; Vallely et al., 2013). In the Pacific, the leading causes of the maternal mortality rate (MMR) remain the same as those reported globally, with the addition of the important indirect causes of malaria and anaemia, particularly in the Solomon Islands and PNG (Sanga, de Costa & Mola, 2010; WHO, 2010).

In PNG, epidemiological data from 2006 to 2009 indicated that the MMR had increased from 370 to 733 per 100,000 live births. In contrast, the Solomon Islands reported a reduction in the MMR from 345 to 145, Fiji reduced from 41 to 30, Kiribati reduced from 225 to 158, and Vanuatu remained at 86 deaths per 100,000 live births. In 2012, the WHO reported a reduction in PNG’s maternal mortality, with an estimated 250 deaths per 100,000 live births (down from 733/100,000), and reported infant mortality of 48 deaths per 1,000 live births (a reduction from 65 deaths/1,000 live births) between 2009 and 2012 (WHO, 2013a). When compared to PNG’s high-resource Western Pacific neighbours, such as Australia, Japan and China—where the MMR ranges from 8.4 in Australia to 34 in China (WHO, 2011)—PNG still ranks high in maternal mortality in the Asia Pacific region.

1.2.1 PNG morbidity and mortality indicators.

In 2012, the leading causes of death in the PNG population were lower respiratory infections, tuberculosis, HIV, diabetes and malaria (WHO, 2010, 2013b). These diseases affect both male and female populations, with females having a longer life expectancy (of 65 years) than males (of 60 years). Many of these deaths are underscored
by social determinates, health risk behaviour and lack of accessible and affordable health services. Further, low health literacy, a lack of health education, poverty among women and family violence further affect health indicators. Other factors specific to PNG healthcare delivery and associated outcomes include geographical and environmental factors (transport systems, mountainous terrain, landslides, flooding and monsoonal patterns) and social, cultural, political and economic instability and sustainability. Alongside these are the government’s limited funding for health service (Bhutta, Cabral, Chan & Keenan, 2012; Karlsen et al., 2011; Vallely et al., 2013).

1.2.2 PNG obstetric indicators and health service provision. In 2013, the PNG population had steadily increased since 2006 due to safer childbirths, many unplanned pregnancies, women having children at close interval and increase in teenage pregnancies (National Department of Health, 2009). In 2010, the total fertility rate was 3.8% per woman, with a population growth rate of 2.8% (AusAID, 2011; WHO and National Health Department, 2012). It is also estimated that the number of births attended by health professionals increased from 38% in 1990 to 53% in 2009 (WHO, 2013a).

In most instances, infant morbidity and mortality follow the same geographical pattern as maternal morbidity and mortality, occurring among low-income women and in resource-poor countries. In 2012, it was reported that, globally, around 3.6 million neonates were born as stillbirths, and nearly three million neonates did not survive beyond the first months of life (WHO, 2013c). Most neonatal and infant deaths that occurred were considered preventable and arose from a range of social determinants, including women having no access to functioning facilities staffed by qualified healthcare professionals, such as midwives or others with midwifery skills (WHO, 2015a).
Table 1.1

Demographic data for PNG

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Year of demographic health survey</th>
<th>Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>2013</td>
<td>7.321 million</td>
</tr>
<tr>
<td>Population annual growth rate</td>
<td>2009</td>
<td>2.83%</td>
</tr>
<tr>
<td>Women at reproductive age (15–49 years)</td>
<td>2009</td>
<td>723 million</td>
</tr>
<tr>
<td>Total fertility (children per woman)</td>
<td>2013</td>
<td>3.8</td>
</tr>
<tr>
<td>Infant mortality</td>
<td>2009</td>
<td>52/1,000</td>
</tr>
<tr>
<td>Maternal mortality</td>
<td>2013</td>
<td>220/100,000</td>
</tr>
<tr>
<td>Births attended by skilled birth attendants</td>
<td>2009</td>
<td>53%</td>
</tr>
</tbody>
</table>


In 2008, the WHO (2010) reported PNG to have a total of 2,841 nurses and midwives while the World Bank in 2009 reported 3619 (head count), a decrease from 3980 in 2004. The decrease occurred when payroll cleansing occurred and ghost names were removed to provide the near accurate number of nurses and midwives. Other cadre of health workers such as Health Extension Officers (HEO), Community Health Workers (CHW) and Allied Health Workers also reported a reduction while the Doctors had a constant increase from 524 in 2004 to 570 in 2009 through this cleansing system leading to health workforce crisis in PNG (Morris & Somanathan, 2012). Despite the increase from 2008-2009, the nurse to patient ratio remains at approximately five per 10,000 live births, while the midwife to patient ratio was one per 1,000 live births (Dawson, Howes, Gray & Kennedy, 2011; WHO and National Department of Health (2012). This ratio of midwives to live births is low compared with high-income/resource countries, such as the US, with 55 midwives per 10,000 live births, and European countries, with 68 midwives per 10,000 (WHO, 2010). Midwives play a vital role in saving millions of lives for both mother and her baby therefore provision of health care across community and community and health facilities and however in PNG, a rapidly aging workforce, meeting the demand of the increasing population will be challenging
Currently in PNG, health institutional–based deliveries account for 52% of deliveries in predominately urban settings, which suggests that 48% of rural births remain vastly under-supervised ((Morris & Somanathan, 2012; UNICEF, 2009). Of note here is that rural births may mean health center, sub health center or village births where there is no reliable data available. Given PNG’s annual population urban growth of 1.9% and rural population growth of 1.4%, the vast majority of women in remote rural areas (where 85% of the population reside) are still delivering unsupervised. In an effort to reduce the workforce shortage is that, as of 2013, the PNG Nursing Registration Board has assumed responsibility for organising the registration and licensing for nurses to practice their profession—a crucial approach towards health system strengthening (National Department of Health, 2015).

Given the above country indicators, the Australian government employed a targeted development assistance program, with disbursement of 54.9% of PNG Aid going to health service from 2009 to 2010 (WHO, 2010) with the aim of improving infrastructure, health workforce and administrative (AusAID, 2011; Foster et al., 2009).

1.2.3 PNG health vision. The PNG government has a central mandate for its ‘People to be Healthy, Wise, Smart, Fair, Happy by 2050’. The government aims to strengthen the health system through providing responsive, affordable and accessible health services (Government of PNG, 2009). The challenge is for the PNG population to ensure this vision eventuates through adopting the health promotion strategies for healthy lifestyles and eradicating illness. The National Health Plan for 2011 to 2020 outlined eight key result areas (KRAs) to target in order to improve the health of the PNG population to meet the MDGs. These KRAs are summarised as follows:

- MDG 1: improve service delivery
- MDG 2: strengthen partnerships and coordination with stakeholders
• MDG 3: strengthen health and governance
• MDG 4: improve child survival
• MDG 5: improve maternal health
• MDG 6: reduce the burden of communicable disease
• MDG 7: promote healthy lifestyles
• MDG 8: improve preparedness for disease outbreak and emerging population health issues.

Of these priority areas, those applicable to this study are MDG 2 (strengthen partnerships and coordination with stakeholders), MDG 4 (improve child survival), MDG 5 (improve maternal health) and MDG 7 (promote healthy lifestyles). The main focus is MDGs 4 and 5, which dominate this study (Government of PNG, 2010).

While these key priority areas are achievable to those living in the vicinity of a health and education facility or with access to roads and transport, they are not possible for the majority of the population who live in rural settings (Government of PNG, 2010a). Thus, the PNG government aims to develop strategies to reach rural communities and use a ‘bottom-up’ approach to reach these communities (Razee, Whittaker, Jayasuriya & Yap, 2012). Currently, the PNG National Department of Health contributes to people’s health and wellbeing by improving basic service delivery and strengthening primary level care in health facilities for the rural population, where 85% of the PNG population lives (Government of PNG, 2010; WHO, 2013a).

PNG health departmental heads have the responsibility of ensuring strategies are implemented, with assistance from development partners, such as resource developers Oil Search, Department of Foreign Affairs and Trade (DFAT), private healthcare providers, churches and other non-government organisations (NGOs). In order to
achieve these goals, in-depth contextual examination is required of the social, cultural and economic factors that affect the provision of health to mothers, babies and families.

1.3 Geographical and Demographic Background of PNG

PNG shares a land and sea boarder with Indonesia and Australia, and is part of the Oceania region. Classified as a lower middle-income country, PNG is known for its diverse and large reserves of minerals, extensive forestry and fishery, significant agricultural land and potential location for ecological and cultural tourism. The country is comprised of 600 associated islands, making PNG the largest South Pacific nation in terms of landmass. PNG’s existing cultural traditions are linked to 820 languages (Briney, nd) The country has a constitutional parliamentary democracy and Commonwealth type of government, after gaining independence from Australia in 1975 (Briney, nd)

![Map of PNG](https://nationsonlineproject.com/graphics/1998-2016/papuaglobe1.jpg)

*Figure 1.1. Map of PNG. Source (Nations online project, 1998-2016)*
**1.3.1 Administrative structure.** The country is divided into four regions (Momase, New Guinea Island, Highlands and Southern), with 21 administrative centres (highlighted in red in Figure 1.1), which are governed by the political head as governor for each province and foreseeing the political and administrative decision-making. The country has three levels of governance—national (prime minister), provincial (governor) and local (district administrators)—with each government head appointed through political agreement. Within each province, there are different provincial departments, such as health, education, primary industries and justice, all of which have their own head to oversee departmental responsibilities. Decision making at each level of governance often affects the service delivery provided to end recipients.

**1.3.2 Religion.** The majority of the PNG population are from Christian backgrounds, with two-thirds of the population being Protestant (Lutheran, Anglican or Uniting Church), and with Pentecostal followers growing (Jackson, 2013). Catholicism accords for one-third of the population, and there is also a growing number of Seventh Day Adventists (Jackson, 2013). A small number of Baha’i followers, Jehovah’s Witnesses, Muslims and Mormons also have churches and denominations in PNG. Despite these religious affiliations, many people remain engaged in traditional religious animist beliefs, such as rituals of magic, spells and sorcery, which are widely practised and currently attributed to causing violence and death in many parts of PNG (Jackson, 2013).

**1.3.3 Income, imports and exports.** PNG has a strong subsistence base and cash income from agricultural exports, which provide incomes for 80% of the PNG population, and thus helps reduce poverty among rural people (Bourke & Harwood, 2009). Many people in PNG live at the poverty head count ratio of US$1.25 per day
however; many families depend on substance farming (Bourke & Harwood, 2009).

While mining and petroleum are important for the country’s economy, the local production of food for consumption and sale is adequate for the growing population. In PNG, most food is grown for consumption and sale, and is categorised as staple food, such as sweet potato (*Kaukau*), sago, banana, yam, taro and cassava. Also grown are vegetables, such as cabbages, broccoli, carrots and potatoes, which are often exported domestically from the highlands to coastal areas for sale. Anecdotally, the coastal people also domestically transport betel nuts and coconuts in large quantities to the highlands of PNG, which brings income to their families. In addition, PNG exports gold, gas, Arabica coffee, cocoa, palm oil, copra oil, tea, timber, log and balsa, which also provide income for citizens and the country (Bourke & Harwood, 2009).

Agricultural products provide financial support in terms of school fees, medical fees, transportation, food, housing and other basic needs of families.

Generally, both husbands and wives contribute to labour to attain food and produce cash crops. While women mainly sell food at markets for cash, men sell crops, such as coffee and cocoa, to provide financial support (Grossman, 2014). Anecdotally, small business opportunities in the country include tailoring and designing by women, using modern and traditional materials to make *meri* (women’s) blouses, outfits for women and men, school uniforms for children, *billum* (string bags), traditionally made caps and *billum* wears from bush materials. Men’s employment tends to be operating a bus or taxi service in urban or rural centres as well as artefacts making and weaving baskets.

**1.3.4 Family structure and social life.** The vast majority of the PNG population live in villages within their clans and tribes. Their land is commonly passed down from parents in order to produce food. Social organisation in most parts of the
country follows patrilineal lineage patterns, with a few coastal provinces having matrilineal descent. However, in the matrilineal sector, decision-making powers are still predominately held by men (Hinton & Earnest, 2010b). Men are dominant when making decisions regarding the family and community. The dominancy is further supported by a practice of bridal payment which is commonly practised where family of the bride receives cash and goods (garden, stores or domestic animals) by the groom’s family. This bride payment often leads to women being ‘owned’ by their husbands, which empowers the men to believe they have the authority to make certain decisions, such as deciding how many children they will have, giving approval for women to undertake family planning, and even deciding to marry other women (Hinton & Earnest, 2010b).

The average PNG family comprises approximately five people; however, everyone in the village helps care for each other’s children because of an extended family system. In addition, households may often have more than five family members. Some men are able to marry multiple wives due to having a higher education, higher business status or being the village ‘hetman’ or ‘leader’; however, the majority of marriages in PNG involve a single couple family unit (Bourke & Harwood, 2009; Wardlow, 2007). In most circumstances, men with polygamous families ensure that separate houses are built for each wife and her children, wealth (such as land) is divided evenly, and protection is provided for everyone. Contemporary PNG women undertake numerous and complex family, kinship and household roles, responsibilities and tasks, which require considerable physical and psychological effort. This not only affects women psychologically, but also causes financial insecurity and heavy workloads that impinge on their health. In a study on the psychosocial health of PNG women, Hinton and Earnest (2010a) described the complex daily tasks of women in East Sepik, PNG,
as a metaphorical ‘flying fox’, where she can climb a coconut tree and cut down sago palm indicative of how many various task and skills need to perform to ensure the survival of her family. Given the magnitude of women’s tasks, when a woman dies (especially during childbirth), she leaves behind a large role to fill. Her husband and children must assume the household responsibilities, which often leads to malnutrition and other physical and psychological morbidities in families (Hinton and Earnest, 2010a).

1.3.5 Men’s obligations and roles in family decision making. PNG men view children as having considerable socioeconomic benefit because of the tasks children can undertake, such as helping toil the land; defending the family and land during tribal fights; and contributing to customary obligations, such as paying compensation for deaths or killings, or being a bride payment to a kin clansman. However, despite children’s perceived value, customarily, PNG men do not enter the labour ward or village hut when women are giving birth. They tend to believe that exposure to the blood of childbirth will weaken them and potentially cause them to be killed during tribal fights. This is especially the case in the PNG highlands, where men believe that exposure to blood will cause a man to lose his masculinity or be killed in tribal warfare (Wardlow, 2007), or that food will not grow properly to enable a good harvest. In parts of Sepik, this culture is still observed to date (Scaglion, 1978; Schofield, Tucker & Westbrook, 1961).

Most men have not witnessed childbirth and consider it a risky and dangerous business. Interestingly, some men who have witnessed the difficulty of childbirth have undergone non-scalpel vasectomy to support their wives, relieving them of future childbirths (Tynan et al., 2012). In contrast, some men oppose this practice, seeing childbearing as a woman’s issue and that taking part in family planning promotes
unfaithfulness (Kura, Vince & Crouch-Chivers, 2013). However, increasing evidence of men participating in family planning is seen in the increased vasectomy rates. The Eastern Highlands of PNG saw a constant increase from 2004 to 2008, from 228 to 308 vasectomies. Other provinces have seen a slight increase, such as Morobe, from 228 to 271, and the Southern Highlands, from 120 to 148. In contrast, the National Capital District decreased from 473 to 455 from 2004 to 2008 (Eastern Highlands Provincial Health Authority, 2013; Government of PNG, 2010b).

1.4 Healthcare Structure of PNG

In 1997, the PNG health system was decentralised under the National Administrative Act 1977 (WHO, 2014a). The main structures of the health system are primary and secondary health services, with health managers responsible for planning, controlling and overseeing decisions related to the administration, human resources, infrastructure and finances of the health service (see Appendix 1). In 2007, a review in the Provincial Authority Act was conducted of the services provided by the primary and secondary health services, which led to development of a new structure for services to be channelled in the health sector. The Provincial Authority Act (WHO, 2014a) was developed to integrate the management of hospitals and primary healthcare services under the umbrella of the Provincial Health Authority (PHA) system.

The PHA was established with the aim of improving the management and control of health function grants and health worker supervision and accountability. However, its main problem was that implemented services were not reaching the end recipients—patients, and their families and communities. Only a few provinces took the initiative of implementing the PHA structure, with the majority still following the traditional structure, in which services and directives are implemented under the former primary and secondary health divisions. Commonly, the health services in the province
have two different health managers, whereas the PHA system has both a primary and secondary health service under the directive of one departmental head.

In PNG in 2014, 50% of the health service was provided by faith-based organisations, such as Catholic, Nazarene, Lutheran and Seventh Day Adventist churches in the framework of non-government partnerships, who employ a large number of nurses and allied healthcare professionals. These faith organisations offer a wide range of healthcare to people in remote rural communities, with some services funded by government and donor organisations, such as AusAID, NZAID, the European Union and Japanese International Cooperation Assistance (JICA) (Ascroft, Sweeney, Samei, Semos & Morgan, 2011).

1.5 Education System of PNG

The education system of PNG has four tiers, commencing with elementary education that is taught with local vernacular (Tok Pisin/Pidgin) for two years. Students then continue into primary school from Grades 3 to 8, secondary education from Grades 9 to 12, and tertiary education after Grade 12, which encompasses colleges and universities. In the primary and tertiary education sector, the language of instruction is English. Students attending schools in PNG are required to complete three national exams after finishing Grades 8, 10 and 12, which determines their next level of achievement—either to continue schooling or to return to their community, with no pathway for further advancement. A successful Grade 12 candidate with good academic results is eligible to enter tertiary colleges or universities. In PNG, over 15,000 Grade 12 students graduate each year, and, with the current free education system, more than 20,000 secondary school students have graduated from government or private educational facilities in the last two years. However, a major obstacle to furthering education is the limited space available in colleges and universities, with many
candidates unable to enrol and forced to return home with no career plans, while parents who can afford high fees often send their young adult children overseas to pursue further education (PNG Office of Higher Education, nd)

PNG education institutions consist of universities; technical, teachers, nursing, fisheries and maritime colleges; police colleges; and the Defence Force Academy. PNG has six main universities—four of which are government funded and two of which are operated by church agencies (Catholic and Seventh Day Adventist). A third university for Lutherans is currently being launched. PNG universities attract students from other Pacific Island countries, such as Vanuatu, the Solomon Islands, Tuvalu, Tonga, Samoa and Fiji. The PNG government currently offers 200 scholarships to some Solomon Islands students to attend PNG universities, and will continue to support this scholarship until 2022 (PNG Office of Higher Education, 2013). These PNG universities conduct many different programs for undergraduate students, while a few offer postgraduate courses, including doctorate-level studies. Among these universities, four conduct health-related programs for undergraduates and postgraduates.

1.5.1 Tertiary health education programs. The health programs at university level in PNG are undergraduate diplomas, undergraduate bachelors, postgraduate diplomas and degree programs to cater for different categories of healthcare professionals. These include undergraduate bachelor programs for doctors (Bachelor of Medicine/Bachelor of Surgery), pharmacy, dental science, radiography, medical laboratory science, post registration nursing courses (such as a Bachelor of Midwifery), acute care, mental health and paediatrics. Of note here the bachelor courses are offered as post registration courses. Other courses offered include diploma of community health, environmental studies, health management and leadership, rural health, physiotherapy and eye care. Many other varied postgraduate and undergraduate courses
are offered across the universities. University A\textsuperscript{2}—a government university—uniquely offers expansive teacher education programs that currently include a Diploma of Health Education, Diploma of Health Teaching and Bachelor of Midwifery (University of Goroka, 2005-2009).

1.5.2 Medical and nursing accreditation system. In PNG and many other Pacific Island nations, accreditation is required for the institutions that provide education for healthcare professionals at undergraduate and postgraduate level, for nursing, medical and allied health programs. A national accreditation body ensures that these health programs meet national and international standards and competencies for healthcare professionals to engage in safe and competent practice (McKimm et al., 2013). The tertiary education facility of a given institution must provide quality education and clinical practice to equip graduates with the necessary skills, knowledge and attributes to provide safe and effective care to their clients (McKimm et al., 2013).

Since 2000 in PNG, the main bodies involved in health programs offered at degree and diploma levels by universities have been collaboratively accredited by the PNG Ministry of Higher Education and PNG Nursing or Medical Council. The certification programs offered by the Department of Health have been accredited by the Nursing Council of PNG since 1970. In contemporary PNG, challenges sometimes remain for accrediting professional education programs to meet the standards for licensing and registration, especially when introducing a new program. Another challenge is that professional and regulatory bodies may not have set standards or frameworks on which to base their evaluation when conducting accreditation, as seen in University A’s Bachelor of Clinical Maternal and Child Health (BCMCH) from 2005 to 2009—the context of the current study. Academic committees and faculty boards certify

\textsuperscript{2} For privacy reasons, the university studied in this thesis is referred to as ‘University A’ throughout this document.
graduates’ competency using the standards set by professional and statutory bodies with health practitioner regulatory authority when in existence ensuring accreditation of programs (McKimm et al., 2013).

1.5.3 Milestones in the development of nursing in PNG. In 1926 in PNG, nursing education began in hospitals based. The first nursing workforce were trained as maternal and child health workers and nurse aids, with education entry levels at Grade 6 (primary school), by missionary groups that first settled mainly along the coastal region of PNG. Significant education sector changes began in 1958, when nurses were trained as ‘territorial nurses’ or enrolled nurses. At this time, nurses were trained for three years. Then, in 1970, registered nursing program began training nurses to become nurse leaders and general nurses via an apprentice-type system similar to Australia, with a Grade 10 (high school) entry level (Roxburgh, Watson, Johnston, Lauder & Topping, 2008; WHO, 2013d). During that period, several nursing colleges were established in different parts of the country to train nurses in both enrolled and registered nursing programs, conducted by both government and religious organisations. Also in 1970, the Nursing Council of PNG assumed the role of legally enrolling and registering nurses for both government and church-run nursing colleges (WHO, 2013d).

In 1999, another shift occurred when pre-service (undergraduate) nursing education programs offered in the hospital setting changed from certificate to diploma courses. This shift promoted PNG university-affiliated diploma programs to be co-managed and trained by both the Health Department and Office of Higher Education (OHE). Of note here is that, prior to 2000; the educational level for entry to PNG’s nursing certificate program was primarily the completion of Grade 10 (high school). In line with the increased level of nursing programs, the entry for diploma programs became a requisite Grade 12, which aligns with international and Australian educational
standards. These diploma in nursing programs are currently funded by the government through OHE and Australian Aid scholarship awards for nursing students (PNG Office of Higher Education, nd)

1.5.4 PNG graduate tertiary nursing education program. In PNG, the persistence of relatively high maternal and infant mortality has become a critical public health concern. The PNG National Department of Health, aid agencies and NGOs have implemented a number of strategies to address this concern, often with limited success, poor or non-existent evaluations and limited sustainability (Duke, Kado, Auto, Amini & Gilbert, 2015). One such support was to improve the knowledge level of the healthcare workforce. In 1998, with an upgraded prerequisite education level from certificates to diplomas and degrees for different disciplines in the health workforce, nursing programs were also upgraded to provide better quality and safer client care. At this time, PNG’s post-basic nursing registration courses were upgraded from hospital-based, post-basic certificate training to university-based advanced diplomas in midwifery, paediatrics, acute care and mental health. PNG’s midwifery education was also embedded as a separate certificate within registered nursing in 1961 until 1979, before upgrading the midwifery registration requirements to an advanced diploma program (AusAID, 2011)

PNG is the only country in the Pacific region that educates paediatric or child health nurses, while midwives are educated throughout the region (Duke et al., 2015). The child health post-basic program commenced in 1971 to educate nurses to work in inpatient paediatric units, special care nurseries, children’s outpatient clinics and rural health facilities. The PNG child health nursing competency standards guided the practice of child health or paediatric nurses. In addition to performing a specialty role as paediatric or child health nurses, these nurses were equipped with knowledge and skills to promote an environment for safe healthcare and improved health outcomes through
nutritional advice and immunisation (National Department of Health, 2015). These child health nurses were also required to complete WHO and UNICEF’s 1990, Integrated Management of Childhood Illness (IMCI) training, which used the IMCI checklist to incorporate the aims of reducing under-five mortality from all major causes in the low-resource setting. This IMCI checklist was for the purpose of improving health worker skills, improving community and family practice, and strengthening the health system (Nickoll, 2000). The IMCI formed the baseline for the child health component in University A’s BCMCH curriculum (University of Goroka, 2008).

Given the background of the WHO MDGs for 2000 to 2015—particularly MDGs 4 and 5—the PNG Department of Health imperatives were to provide universal supervised maternal service delivery. University A established postgraduate double major Maternal and Child Health programs alongside three other universities (the University of PNG, Divine Word University and Pacific Adventist University) with them offering other postgraduate programs in 2005. These postgraduate programs were offered as one-year courses, with most universities taking an extra six months to complete the competencies required for graduation. From 2005 to 2009, University A established a corporate vision of improving nurses’ educational knowledge to better provide for communities—particularly remote rural health needs—at the bachelor level. As such, village birth attendant (VBA) and village child health worker (VCHW) programs were introduced to the maternal and child health curriculum, with the primary aim of transferring knowledge to areas of need and increasing healthcare availability, especially in rural villages and communities.

While PNG’s population continues to increase, the education of healthcare workers and provision of healthcare has lagged considerably in terms of number and scope. From 2002 onwards, graduates from university-affiliated nursing programs have
encountered a major setback because they have been unable to obtain registration and licensing due to the lack of registration frameworks to guide this process. Thus, while nurses have graduated, they have been unable to seek employment, or have mainly worked as casual employees, without being able to perform the specialty work they studied, such as in midwifery or paediatrics (Dawson et al., 2011). In PNG to date, there are no recognised national competency standards for graduates to enable registration (Dawson et al., 2011). At the time of completing this thesis, PNG registration procedures were being developed by the PNG Regulatory and Education Board to enable more midwives to register to practice.

As for University A’s double major in midwifery and child health (the BCMCH), courses were only conducted until 2009. In 2006, a report released by WHO (Kruske, 2006) called for a single strand of midwifery and paediatrics to be commenced, instead of a double major (the BCMCH) as it was not reducing the maternal and infant mortality in the country. The graduates of the BCMCH were given options to register as midwives or paediatric nurses and to practice in their area of specialty instead of registering them as a BCMCH nurse due to no registration framework in place.

The focus of this thesis was to conduct a modified program evaluation on University A’s BCMCH nursing program from 2005 to 2009, which had the core aim of educating multi-skilled nurses to work in both obstetric and paediatric units and remote rural locations. Also unique to University A’s program was in-depth education on HIV/AIDS counselling and testing where students were awarded a certificate, in addition to the existing nursing degree (see Chapter 4). Of particular importance was identifying high-risk factors in pregnant women and children, aimed towards timely referrals to the nearest health facility. This study also examined 16 core curriculum
modules embedded in midwifery and child health nursing education, with seven
modules on urban and rural health education, practice and promotion initiatives,
including VBA and VCHW community training. A component of this 14 module
program was that the BCMCH students lived in targeted villages for eight continuous
weeks, learning about village life, culture and health practices in order to better
understand the contributing factors to health behaviours. The main objective of this
rural community practice was to promote ‘healthy homes’ and the effective training of
VBAs and VCHWs (University of Goroka, 2008).

1.6 Significance of Study

In PNG, the documented current barriers to effectively reducing maternal and infant morbidity and mortality include the geographical factors of remote locations, mudslides, mountainous terrain, poor roads due to the monsoon climate, poor transportation and resource-poor conditions. Further, health system strengthening is critically needed, particularly in the workforce, given that many health staff are not sufficiently supported, educated and equipped to work in remote health centres. Some facilities have been forced to close due to the lack of staff, thereby further resulting in unsupervised births (Dawson et al., 2011; Kruske & Barclay, 2004). Furthermore in 2009, a PNG ministerial taskforce formed a working committee to initiate the education, training and deployment of skilled midwives for community health posts—notably, health centres (Government of PNG, 2009; National Department of Health, 2013).

The development of University A’s double major in midwifery and child health (the BCMCH) was designed to train nurses with midwifery and child health knowledge and skills. The purpose of University A’s program was to assume responsibility for meeting the needs of paediatric, child health, obstetrics and gynaecology issues and
conditions in health facilities, including rural health posts (Government of PNG, 2009; National Department of Health, 2013). This curriculum was also implemented to train multi-skilled nursing professionals who could fill the gap in the health professional workforce shortage, particularly in remote rural settings (University of Goroka, 2008). Another new approach adapted only by University A’s double major was the inclusion of VBA and VCHW training, as well as a focus on rural communities’ experience.

University A’s VBA and VCHW training program focused on identifying pregnant women—whether at risk of health concerns or not—and encouraging them to attend antenatal care and health facilities for child birth. The training program also assisted VBAs and VCHWs to identify at-risk children using the WHO’s Integrated Management of Childhood Infections (IMCI) (‘too sick’ signs) checklist, and to make early referrals (Nickoll, 2000). The ‘too sick sign’ checklist consist of a full head to toe body of a child between one and five years of age, screening for fever, sunken eyes, irregular or fast breathing and not sucking well from the breast.

To date, only one evaluation has been conducted of the long-term outcomes of university nursing degrees in PNG. This was an evaluation of University A’s double major (BCMCH) (Kruske, 2006). In 2006, a WHO investigation into midwifery education programs in PNG was commissioned and undertaken by Charles Darwin University, Australia recommending considerable improvements to PNG’s midwifery education curriculums and education facilities (Kruske, 2006). However, a major limitation was that it failed to examine the needs and health education requirements of University A’s graduates, affiliated VBAs and VCHWs, and rural maternal populations. It is critical that any nursing education program be comprehensively evaluated to determine the long-term effect it has on all stakeholders and end recipients, and identify
whether the program has met its intended purpose and educational outcomes. Thus, this will be further examined in Chapter 2.

1.7 Purpose of the Study

The purpose of this study was to evaluate the long-term educational outcomes of the BCMCH program conducted from 2005 to 2009 in respect to the training of healthcare providers, VBAs and VCHWs in PNG.

1.8 Aims of the Study

The main aims of this study were as follows:

- to enhance University A’s previous BCMCH program, based on empirical data, in order to inform the potential implementation of a new higher degree course that would be educationally current and culturally relevant for the PNG tertiary sector
- to provide empirical data for the PNG Department of Health on a new module for maternal and child health graduates that targets rural and remote health communities
- to better inform maternal and child health educational knowledge and skills transfer based on sustainable and relevant partnership with key stakeholders
- to critically evaluate the perceived strengths and weaknesses in the transfer of knowledge and skills to stakeholders (midwives, VBAs and VCHWs).

1.9 Research Questions

This research posed six research questions, as follows:

- What were the strengths of the previous educational module that was used to inform the training of BCMCH students?
- What were the weaknesses of the previous educational module that was used to inform the training of BCMCH students?
• What were the perceived strengths in the transfer of knowledge and skills to VBAs and VCHWs?
• What were the perceived weaknesses in the transfer of knowledge and skills to VBAs and VCHWs?
• What were the perceptions of postnatal women regarding VBA training?
• What convergent and divergent themes were identified from the different phases of the study?

1.10 Structure of the Thesis

The dissertation follows a standard structure. The current chapter has provided a general background on maternal mortality and the issues affecting the health of women in PNG. It has also discussed the socio-demographic context of the population, key health indicators, and significance of this research to PNG’s maternal and infant health outcomes. Chapter 2 critiques the current global, regional and country-specific literature to provide a rationale for this study focus and its associated methodology. In particular, it discusses sampling and methodological limitations in the empirical literature related to the PNG context. Chapter 3 introduces the qualitative descriptive design and modified program review approach. It discusses the four-phase evaluation employed in this study, based on knowledge and clinical skills transfer, and outlines the sampling strategies used in each of these phases, the piloting process employed for each phase, the process of ensuring rigour in data collection and analysis of each phase, and how each phase was analysed to inform subsequent phases. It also outlines the process of obtaining ethical approval from both the university and health department of PNG as part of the ethical requirements.

Chapter 4 presents the first data subset of University A’s BCMCH curriculum mapping and analysis. Chapter 5 undertakes an analysis of the face-to-face interviews
with the BCMCH graduates, and explores the themes that emerged from these interviews. Chapter 6 presents the VBA and VCHW focus group interview data, and discusses the emerging themes. Chapter 7 provides the emerging data from face-to-face interviews with postnatal women. Chapter 8 is the discussion chapter, which presents a critical review of the convergent and divergent themes from all interviews. This constitutes a discussion of the triangulated data from all four phases. It then presents a thorough comparison and contrast of the major findings, seeking to address the research questions before critiquing the strengths and weaknesses of using an evaluation design approach in the contemporary PNG tertiary education and healthcare context.

The final chapter, Chapter 9, concludes this thesis with a summary of the key findings from the data. It summarises the extent to which the research questions were addressed, and includes recommendations for PNG health policymakers, as well as the education and health service. In particular, it provides recommendations for health system strengthening for rural and remote community health service delivery, and recommendations for university-based educational reforms. It also offers suggestions for future study based on the current study’s findings.
Chapter 2: Literature Review

2.1 Introduction

This chapter begins by critically reviewing the literature relevant to developing the MDGs (United Nations, 2015) existing at the time of University A’s BCMCH program and the current study, pertaining to reducing the global burden of maternal and infant morbidity and mortality. It lists the approaches employed to retrieve literature from databased sources, including discussing the keywords, exclusion criteria and overall retrieval findings. The remainder of the chapter provides a thematic review of the findings, organised sequentially by international and regional (Pacific) context, particularly pertaining to low-resource countries. It also presents the key epidemiological maternal and infant morbidity and mortality data in order to provide a contextual baseline.

A specific focus is critically reviewing the literature on the development, provision and evaluation of skilled birthing attendants to improve women and children’s health in rural and remote low-resource contexts. This is followed by discussing the United Nations MDGs and other related global health initiatives aimed at improving MDGs 4 and 5. The latter section reviews selected nursing and midwifery education programs and other empirical evaluations of curriculum knowledge transfer from students and graduates to healthcare consumers, both internationally and in low-resource contexts. A particular focus is empirical studies of learning outcomes and knowledge transfer in health service curriculums, and the competencies required to reach healthcare consumers—in the case of the current study, these consumers are rural PNG mothers and their infants in low-resource settings.

Further, a foundation of the current research is examining studies that consider the role of the midwife in conducting adult education for unskilled health workers, both
in clinical practice and in a health service curriculum, using evidence-based outcomes. The final section of the literature review summarises the history, development and efficacy of traditional birth attendants (TBAs), and subsequently VBA and VCHW education programs, and the associated reductions to the burden of disease for maternal and infant morbidity and mortality in low-resource contexts.

The conclusion outlines the gaps in the current international literature and particularly the PNG literature, and the associated methodologies for evaluating health education curriculum clinical knowledge and skills transfer from policy setting to curriculum planning and implementation.

2.1.1 Search methods. Computer-based search engines were the primary source for literature access, with most literature accessed from the following databases: Google Scholar, Social Science and Medicine (Elsevier), ProQuest, Wiley Online Library, Journals for Nursing Education, Pub Med (Medline) and Bio-medical Central. Most studies were from sources published from 2009 to 2015, although allowance was made for earlier studies to account for historical events in PNG and VBA education.

2.1.2 Search terminologies. This study involved both nursing professional education and unskilled nursing professionals and rural mothers as recipients of the educational outcome of a newly developed curriculum. Thus, search terminologies varied from education to practice. The keywords used as identifiers were: ‘curriculum knowledge and skills transfer’, ‘curriculum evaluations’, ‘maternal and child health knowledge and skills transfer’, ‘village birth attendant training and support’, ‘training of village child health worker’, ‘low income nursing education programs’, ‘nurses’ role in knowledge and skills transfer’, ‘Midwifery nursing’, ‘role of Midwives’ ‘learning resources in low-resource settings’ and ‘nursing in Papua New Guinea’. Excluded were non-English-language studies. An additional focus subsequent to the original search was
to divide the retrieved literature into that pertaining to low- to medium-income and resource-poor countries, although some included comparative data from high-resource countries.

A total of 65 papers were found. Eleven quantitative papers consisted of case studies, cross-sectional studies and surveys. Most research papers used large populations and large to medium effect sizes, and were randomised trials with surveys and cross-sectional studies. There were also 14 qualitative studies using either ethnographic or descriptive phenomenological approaches, mainly in the field of nursing education, VBA and TBA education, and associated roles. Most of the research retrieved was conducted in the Asia Pacific region, especially in Indonesia, Vanuatu, the Solomon Islands, Fiji and PNG (17 papers). Middle Eastern countries were included, such as Pakistan, India and Afghanistan and Sub-Saharan Africa while European countries had publications that mainly related to curriculum knowledge and skills transfer. Other sources of information were international, regional and country-specific government and NGO publications and reports, totalling 24 sources. The reviewed literature fell under the following main headings:

- (2.2) Social determinants of health and need for healthcare strengthening
- (2.3) Curriculum knowledge and skills transfer
- (2.4) Evaluation of curriculum knowledge and clinical skills transfer.

Under the theme of nurses’ roles in health knowledge and skills transfer, the few subthemes related to resource-poor settings and the role that nurses play in knowledge and skills transfer to improve maternal and child health outcomes. This led to the development of the current study.

The next section begins by providing an overview of global and regional aspects of maternal and infant morbidity and mortality. In addition, it outlines the relationship
between educational knowledge and skills transfer, and its relationship with health workforce education and health system strengthening, and associated staffing (midwives, VBAs and VCHWs) levels.

2.2 Examining Social Determinants and Health Workforce Strengthening

The WHO’s (2011) ‘right to health’ states that health status is a result of many social, economic, political, religious and cultural factors, which can influence maternal and infant morbidity and mortality outcomes (Karlsen et al., 2011; Vallely et al., 2013). In 2011, a WHO-led cross-sectional survey of 24 countries in Africa, Asia and Latin America contended that the wider social determinants of health need to be considered when devising strategies to reduce maternal and infant mortality (Karlsen et al., 2011).

The social determinants of health refer to the range of environment factors that are associated with the geo-political region in which people are born, such as the influence of gender, age, religion, ethnicity and income. These social determinants are shaped by inequalities in the distribution of money, power and resources, which are all linked to global, national and local influences (WHO, 2015b).

In respect to mothers and infants, many factors determine health outcomes, health behaviour and associated health risks. Social determinants—such as education, housing, nutrition, employment and access to transportation system (such as roads and mountainous countryside)—all serve to inform the maternal health-seeking behaviour and health risk assessment of women and their families (Danis et al., 2010). Socially-, economically- and geographically-advantaged women are more likely to have better health outcomes than women with limited education and financial support (Karlsen et al., 2011; WHO, 2015b). More highly educated women tend to have more autonomy to make family decisions, with increased health literacy that minimises the socioeconomic
burden placed on their families and society (Karlsen et al., 2011). Sourcing adequate finances to meet children’s social and educational needs can impact on women’s health when undertaking their cultural role as mothers and providers for their families (Hinton & Earnest, 2010a). Thus, inadequate finances and low literacy levels inform maternal women’s ability to source and attend health services.

In 2006, the WHO estimated a global deficit of 4.2 million professional health workers (including doctors, nurses, midwives and all allied health professionals), contending that the vast majority of the world populations still lacked access to appropriate, affordable and accessible healthcare. In 2008, in response to this shortage in the global health workforce, a taskforce working committee was established in many associated WHO regions. Its theme of ‘scaling up and saving lives’ emphasised urgent action to manage the health workforce in the countries most affected by the healthcare worker shortage, such as Sub-Saharan Africa, South East Asia, Latin America and the Caribbean (WHO, 2015a).

Efforts to reduce maternal and infant mortality have been directed at increasing the numbers and educational skills level of birth attendants, which has led to a slight increase from 56% of births attended by the birth attendants in 1990 to 68% in 2012 (Tuncalp et al., 2015). In 2012, the vast majority of unattended births occurred in the remote rural settings of these low- to medium-income countries (Tuncalp et al., 2015; WHO, 2013b). In India, despite having a health workforce shortage, maternal mortality has been reduced substantially from 437/100,000 live births in 1992 to 1993 to 176 deaths/100,000 in 2010 to 2012. This was further associated with an increased number of health facility births through using a social franchise model known as ‘Sky Care’. The Indian Sky Care model has been used to recruit informal rural health workers who are not qualified in healthcare. These rural workers join the network, and then receive
training, training manuals and a telephone to communicate with the Sky Care health facility staff to make referrals. The Sky Care health facility is staffed by doctors who provide mobile telephone consultations with informal workers to deal with basic obstetric care, emergency obstetrics and family planning. This network is supported with financial initiatives for informal rural health workers to make health referrals, thereby increasing births at health facilities and reducing maternal mortality. However, a considerable limitation is the issue of meeting health workforce demands (Pereira, Kumar, Dutt & Halder, 2015).

In PNG to date, the majority of remote and rural areas remain severely underserved by professionals and semi-skilled health workers, falling well short of meeting the health needs of the population which is similar to other low resource countries.

In Indonesia, a quantitative study used a discrete choice experiment to have different categories of healthcare professionals indicate their preference to work in rural settings. This was conducted on 500 health students (250 medical students, 150 nursing students and 100 midwives) (Efendi et al., 2015). Efendi et al. (2015) found that 76% of medical students, 48% of undergraduate nursing students and 39% of midwives indicated that they would like to work in rural settings if conditions were similar to those in urban settings, such as improved quality facilities, resources, housing, salaries and training benefits (Efendi et al., 2015). Efendi et al.’s (2015) findings suggested that much more attention needs to be paid to the long-term sustainability of the health workforce that serves the vast majority of vulnerable populations, especially those who are underserved in remote rural settings.

Further, in 2010, UNICEF (WHO, 2010) called for improvement in reaching women in rural areas, poor households, ethnic minorities and ethnic groups. The
UNICEF report advocated for lives to be saved through increased health education on preventable, avoidable and acceptable maternal healthcare decision-making initiatives. Many remote and rural socioeconomically-disadvantaged populations lack the ability to understand and communicate health information, which leads to associated morbidity and mortality across the life span (Bintabara, Mohamed, Mghamba & Wasswa, 2015).

A cross-sectional study of 428 women in Tanzania that used birth preparedness and complication readiness as a key intervention to prevent maternal mortality found that knowledge on obstetric danger signs was low, and indicated inadequate awareness of health risk danger (Bintabara et al., 2015). The women who had attended antenatal clinics were found to know their expected date of delivery, had saved money for their baby and postnatal needs, and to have organised transport, which increased their likelihood of attending a supported health facility birth (Bintabara et al., 2015).

The literature has reported a relationship between the education of health professionals and population-based morbidity and mortality (Karlsen et al., 2011). This relationship suggests that increasing the health education literacy at population level and health professional and skilled birth attendant level can lead to successful health outcomes. Increasing women’s level of education will improve health literacy and enhance the capacity of women to obtain, process and understand health information, thereby making appropriate health-related decisions (Karlsen et al., 2011). Also of importance is the quality and sustainability of health professional knowledge and clinical skills delivery, which is associated with maternal risk reduction. Formal tertiary-based health education programs that are country specific and culturally target educational knowledge and skills transfer have been found to positively affect maternal and infant outcomes (Daniels et al., 2009).
To improve population-based health outcomes, PNG requires an empirical examination of the capacity for successful transfer of health knowledge and clinical skills from higher education curriculums to health service professionals, then to semi-skilled health professionals, and ultimately to village-based maternal women and their infants. A study in the effort to recruit and retain workers in rural settings, Efendi et al. (2015) proposed recruiting students with rural backgrounds and teaching them rural-specific curriculum so that they can be familiar with rural conditions. However, Efendi et al. acknowledged that retaining staff in rural and remote locations is a challenge, given that many of their participants indicated a preference to work in remote areas for only one to two years.

2.3 Curriculum Knowledge and Skills Transfer

Health education knowledge transfer is defined as a process that involves sharing new knowledge with others, whether occurring in a formal educational setting or in a health service clinical environment (Davies, Wong & Laschinger, 2011). The successful transfer of knowledge and skills should produce behavioural change in practice and produce measurable outcomes through process and outcome as postulated in Kirkpatrick’s 1998 model of learning outcomes (Elfrink, Kirkpatrick, Nininger & Schubert, 2010). Essential to this definition is that theoretical knowledge and clinical skill associated with the transfer are diffused to others, and produce an effect on the targeted populations. In the current research, curriculum knowledge and clinical skills transfer were the target of evaluation—specifically those that pertained to the key stakeholders of BCMCH graduates, VBAs, VCHWs and village-based PNG mothers (postnatal women) and their infants.

Tertiary education institutions provide regulated, quality-assessed and nationally-informed curriculums to educate health professionals in order to guide and
inform professional practice, as required by the regulation board of the country. A curriculum is defined as ‘a formal plan of study that provides the philosophical underpinning goals and guidelines of a specific education program’ (Keating, 2011, p. 1). In 2010, a survey was conducted on 23 engineering students in Honolulu, US, to explore the transference of knowledge and skills from a formal software engineering curriculum to a practicum project. The study aimed to identify why some students were failing to transfer knowledge into practice. It found that one in-depth course was insufficient to ensure the transfer of knowledge and skills, and recommended other targeted professional competency-based courses to fully inform outcome-based practice (Bareiss & Katz, 2011).

The international education literature on the use of e-learning in health education nursing curriculums has indicated that e-learning provides knowledge and skills transfer, with associated positive health outcomes in medium- to high-resource settings (Lahti, Kontio, Pitanen & Valimaki, 2013; Olsen, Becker, Mc Donald & Gould, 2010). A qualitative study undertaken in Finland on the transfer of knowledge via e-learning and its associated effects on nursing clinical practice found that the participants reported that what they learnt ‘stayed in their minds’ and was transferred to their practice (Lahti et al., 2013). This study further contended that continuing education and knowledge transfer evaluations should affect daily work practice (Lahti et al., 2013). In PNG, in the absence of technology such as e-learning, other methods of learning such as hands on demonstration and case studies are used. Despite rapid advancement in technology, and e-learning being championed for its ability to engage learners and individualise the learning process, face-to-face clinical skills teaching sessions continue to be a valuable strategy in nursing (Bloomfield, Cornish, Parry, Pegram & Moore, 2013). In resource-poor settings, such as PNG, despite the presence of a formal curriculum, nurses have
historically learnt their clinical skills through hands-on practice, using clinical case studies, simple mannequins for stimulated learning, situational analysis and evidence-based learning for knowledge transfer (Kruske, 2006).

In a clinical skills course to enhance learning using a multimodal approach for postgraduate nursing students in England, specific considerations were given to learning style and approach, such as clinical class, seminars, assessment strategies and students’ evaluation responses (Bloomfield et al., 2013). However, this study had limited relevance to the current study because it occurred in a high-resource setting. No previous study has examined the use of social determinants in low-resource health educational settings. Any long-term curriculum program evaluation needs to identify specific learning and teaching resources, academic and clinical assessment measures, and the qualifications and clinical competencies of the educators and associated stakeholders. University A’s BCMCH used a multimodal approach to enhance learning, including case studies, return-demonstrations, seminars, tutorials and clinical practice. Hence, for the current PNG University A’s BCMCH study, it was important to include an initial baseline curriculum analysis phase prior to the subsequent stakeholder data-gathering phase. Of central importance to the current PNG study was the transfer of educational knowledge to identified stakeholders, which was used to examine curriculum integrity in the context of addressing social determinants and associated health outcomes, especially in low-resource settings. In the case of the current PNG-based study on a specific BCMCH, curriculum delivery informed by accredited competencies was examined to determine all associated stakeholders’ perceptions of their educational knowledge and clinical skills transference at each successive level.

The International Council of Nurses stated that, internationally, clinical practice competencies are mandated in particular the recognition of significant patient cues
Schober & Affara (2009). Historically in PNG, clinical competency standards were deemed appropriate for routine practice by the Nursing Council of PNG (2003), such as midwifery competency for midwives and child health competencies for paediatric nurses. However, in 2005, in response to a renewed focus on MDGs 4 and 5, a new set of curriculum guidelines were developed in PNG to incorporate midwifery competencies and child health competencies to guide maternal and child health practice that targeted rural communities (Dawson et al., 2011). University A’s BCMCH curriculum incorporated seven modules on VBA and VCHW training and community practice, which differed from all other universities in PNG. In the current study, the curriculum under examination (University A’s BCMCH) had a substantial community focus and community-based, in-country, context-specific situations aimed to enable each level of stakeholders (educators, graduate nurses/midwives and VBAs/VCHWs) to transfer evidence-based knowledge and sound clinical experience to achieve intended healthcare outcomes.

2.4 Evaluation of Curriculum Knowledge and Clinical Skills Transfer

Evaluation of tertiary education programs in terms of both process and outcomes is commonly mandated by the higher educational and professional regulatory bodies of the country concerned, and occurs in three- to five-year cycles (Suhayda & Miller, 2006). Countries must have a clear indication of what must be evaluated using which national accreditation and relevant tertiary educational standards, including the outcomes and competencies to be achieved. These are critical component that need to be considered when conducting program evaluations (Koplan, 1999). This ensures that evaluations are relevant and current, using knowledge based on national and global health priorities. In a framework for evaluating global public health programs, Koplan (1999, p. 8) outlined six steps that need to be followed for effective evaluation:
engaging stakeholders, describing the program, focusing on the evaluation design, gathering creditable evidence, justifying conclusions, and ensuring that findings are disseminated appropriately for decision making and action. Curriculum evaluations constitute empirical systematic approaches to make professional judgements on the merits (quality), cost-effectiveness, health outcomes and significance of a program to meet a given population’s health needs during a particular period (Koplan, 1999).

Knowledge transfer is successful when educational institutions provide necessary learning resources and well-educated academic faculty as well as institutional resources that are conducive to learning. For example, in Korea, a qualitative study conducted on 14 of the 21 schools offering doctoral nursing programs aimed to describe the strengths and weaknesses of the quality of faculties, students, curriculums and resources (Kim et al., 2009). Focus group discussions were conducted with deans, faculties, students and graduates who had completed study three years prior to the research. The participants were asked to describe the strengths and weaknesses of the doctoral program in respect to its objectives, curriculum, learning environment, faculty and quality of infrastructure. This study found that the university program had ageing faculty staff with high workloads and insufficient expertise in nursing theory. In terms of outcomes, the strengths were that the participants were from multidisciplinary backgrounds, and produced diverse doctoral dissertations; however, a significant limitation was the overproduction of dissertations of low academic quality. In examining the curriculum, the study found that there was insufficient time for curriculum development, yet the existing content and faculty resources were sufficient (Kim et al., 2009).
Curriculum evaluation serves the purpose of providing information on a program’s transferability, value, areas needing improvement and potential for termination. Three phases of program evaluation have been identified in the educational research literature—formative, process and summative—when developing and evaluating programs at mega (institutional), macro (disciplinary) or micro (student learner experience) levels (Metcalfe, Aitken & Gaff, 2008; Owen, 2006). Owen (2006) suggested five conceptualised categories to include when conducting a curriculum evaluation: proactive, clarification, interactive, monitoring and impact. This indicates that research, in the case of the retrospective University A BCMCH, must take the initiative to ensure evaluation is conducted in a manner that, where possible, adheres to these summative evaluation steps to produce transferable findings. Such a modified curriculum evaluation must be undertaken in an ethical manner to produce valid and reliable information. Program evaluations of nursing education curriculums—especially in low-resource and low- to medium-income countries—need to conceptualise the requirements needed for a sustainable and culturally appropriate curriculum that will meet the needs of all stakeholders in the associated health settings.

Professional nursing programs aim to prepare nurses to have the competent clinical skills to effectively deliver safe practice (Robinson & Dearmon, 2015). Nursing and midwifery curriculums are generally guided by the international nursing and midwifery standards, incorporating the ICM competencies, which are legislated by the nursing and midwifery registry board to ensure public safety (International Confederation of Midwives, 2014). Currently, as of 2015, all PNG nursing curriculum frameworks use the ICM standards and competencies, developed in line with the country’s development goals, which were approved by the PNG Nursing Registration
Board and Health Advisory Committee to reflect cultural competence and context appropriateness (National Department of Health, 2015).

A culturally appropriate curriculum must be clearly understood and the process of implementation clearly communicated, with consistent monitoring reflecting the effects of any modifications. Curriculum development for extremely culturally diverse settings, such as PNG, must enable the most efficient, transferable and cost effective sustainable outcome. This is of particular importance when knowledge and skills gained by healthcare professionals can be implemented to produce agreed and targeted health outcomes for the end stakeholders—in this case, PNG rural mothers and their infants. For example, in PNG, the current curriculum for midwifery education prioritises identification of high-risk women during prenatal, antenatal and postnatal periods, including gynaecology skills to practice in both urban and rural settings, in a wellness framework (Nursing Council of PNG, 2003a). In PNG, the primary focus of University A’s 2005 to 2009 double major in maternal and child health was caring for mothers in the prenatal to postnatal periods, including associated gynaecological conditions. In parallel was a focus on caring for children aged up to five years, and targeting the child health curriculum content towards nurses in rural and remote community settings (University of Goroka, 2008).

In PNG in 2006, a review on tertiary education facilities, curriculum and services was undertaken on universities providing midwifery and maternal and child health education. The review was commission by the WHO and undertaken by Charles Darwin University, Australia. The aim was to review the quality of education that prepared midwives for skilled care of women during pregnancy and childbirth, including the postnatal period (Kruske, 2006). The review intended to strengthen maternal health services and ultimately contribute to reducing maternal and infant
mortality (WHO MDGs). Review interviews were conducted with key informants, including policymakers, clinical service workers and nursing council representatives, and the nursing education curriculums were examined. Recommendations were made to increase the capacity of midwifery educators and strengthen midwifery education programs and service facilities for clinical education, including the regulations of midwives (Kruske, 2006). The maternal and child health program offered at University A the combined midwifery and child health (BCMCH) program aiming to produce work ready graduates for rural placement. Kruske (2006) evaluation of the midwifery education programs concluded that PNG midwifery and maternal and child health graduates were unable to implement the education they had acquired for rural service delivery due to being employed in urban settings.

A WHO review commended University A’s BCMCH curriculum for its innovative model that targeted and focused on community care; however, it recommended that the effectiveness of the program be strengthened (Kruske, 2006). The stakeholders who participated in the interviews for University A’s BCMCH review (policymakers, clinical staff, nursing students and nursing council representatives) called for the two majors of midwifery and child health to be separated and offered as a single strand of midwifery and paediatric nursing. In particular, stakeholders from remote locations wanted the program to be combined and continued. Unfortunately, the Kruske (2006) review failed to identify and engage all potential stakeholders, especially those involved in the program operations and those who received or used the educational program. Their involvement may have addressed further important stakeholder concerns and values.

Of importance in University A’s program was its involvement of education for three stakeholder groups (nurses, birth attendants/VCHWs and postnatal women in
remote rural communities)—the first of its kind offered in PNG. This was superseded by a recommendation to restructure and develop two distinct programs (midwifery and paediatrics) to fill the skilled workforce gap in order to reduce maternal and infant mortality. However, a major limitation was that University A’s BCMCH was reviewed in 2006, yet the program only commenced in 2005 and had not yet produced any graduates. A major unacknowledged limitation of the commission review was that programs mature and develop over time and need long-term multiple stakeholders outcome-based. In 2010, University A’s BCMCH program ceased and, in 2011, the new midwifery program was introduced.

2.5 Role of Nurses and Midwives in Health Knowledge and Skills Transfer

Knowledge and skills transfer from a curriculum informs the educational basis required to operate health service delivery. Knowledge is gained via formal and informal knowledge transfer between individuals and groups. Formal knowledge transfer occurs through using written or electronic modes, while informal transfer can occur face to face, on social media or through oral communication (Tasselli, 2015). In 2006, a multi-instrumental case study was conducted with 23 advanced nurse practitioners from hospital and primary healthcare settings in the United Kingdom. It identified that advanced nursing practitioners transfer knowledge in multiple forms, such as in written text, electronic formats or face-to-face communication (Gerrish et al., 2011). Informal methods of knowledge transfer—such as demonstrations and simple language explanations—are an important adjunct to formal knowledge transfer in low-resource and remote rural settings, where multiple dialects can pose communication barriers. This is the case in PNG due to its many different language and dialects.
An Italian-based qualitative study with 118 doctors and nurses found that knowledge transfer was more effective in professional groupings, rather than outside these groupings. The contention was that nurses communicate more effectively with their colleagues (other nurses or semi-skilled nurses, such as VBAs), rather than with doctors or other healthcare professionals. Thus, when a healthcare professional student or graduate imparts educational or clinical experience to semi-skilled health workers—in the current study, VBAs and VCHWs with limited health knowledge—the process and outcome of the knowledge transfer needs to be assessed to determine whether it is successful (Tasselli, 2015).

Due to the challenge of low-income and resource-poor health settings having skilled staff shortages—both in the workforce and educational settings—such as in PNG, nurses must undertake an array of roles, including educators, clinicians, carers, managers and (not uncommonly in health facilities) cleaners. In multiskilling when nurses and midwives take on multiple roles often due to shortage of workforce. This is because, in low-resource countries, such as PNG, a clearly articulated scope of practice, performance management system and associated job descriptions are almost non-existent. All aspects of health service delivery outcomes require the transfer of efficient, appropriate and effective knowledge and clinical skills to targeted stakeholders.

In PNG, language barriers often pose a problem, with nurses trained in English, delivering knowledge to VBAs in Pidgin (the national dialect of PNG), and VBAs communicating to rural mothers in their local tribal language. This allows room for misunderstanding and poor health outcomes. The health of clients and communities (especially in rural and remote areas) is affected when either inadequate or incomplete knowledge or skills are imparted to mothers, when seeking to make informed decisions regarding their health choices. For example, transferring specific knowledge and skills
for maternal and child health education from the educational setting to the clinical workplace poses a number of complexities, particularly in low-resource settings.

In PNG, these complexities include newly graduated nurses being employed in a vastly different environment to that to which they are accustomed. For example, students may study in a metropolitan training facility, and then relocate to work in a rural setting, with different geographical terrain, infectious diseases, accommodation, transport and both consumables and non-consumables resources. These differences all affect healthcare workers’ practice (Jayasuriya, Whittaker, Halim & Matineau, 2012).

In order to understand successful knowledge transfer, it is imperative to examine why knowledge can be transferred in certain health professional networks, yet not in others (Tasselli, 2015). This can be undertaken through critiquing the quality of educational policies, qualifications of educators, curriculum engagements with stakeholders, and method and mode of healthcare delivery (Tasselli, 2015). It is also important to identify educational aims, focus on health service delivery needs, determine the risk of the target population, and identify the theory–practice link to communities and individual clients. For example, a PNG nurse or midwife may be required to demonstrate the delivery of a baby to a group of literate and illiterate village women in a remote and rural setting. To determine whether knowledge and skills have been transferred, the village women must perform a ‘return-demonstration’ to the instructor to demonstrate the skills they have acquired in order to indicate their conceptual understanding. Return-demonstration of skills is seen when students observe the skills demonstrated by an instructor, and then demonstrate the skills back to the instructor in order to reflect their level of understanding. This enables measurement of educational outcomes based on the competency required (Bloomfield et al., 2015; Salyer, 2007).
Of note is that, while successful skills transfer may be evident, the necessary cognitive associations may be still lacking. Davis et al. (2011) contended that certain organisational structures tend to encourage professional development and integration of shared knowledge, and are instrumental in knowledge transfer. In summary, comprehensive evaluation of nurses’ roles in the transfer of knowledge and skill is critical for understanding the effectiveness of curriculum knowledge and skills transfer. When knowledge improvements are evident, the educational transfer can be considered successful.

2.6 Improving Maternal and Child Health through Health Knowledge and Skills Transfer in Resource-poor Settings

Maternal care in low-resource settings is best improved through a multilevel approach that includes health system strengthening, and enhancing and up-skilling existing healthcare professionals (Jayasuriya et al., 2012). Also of central importance is strengthening the health service workforce, both educationally and in terms of size. It is also essential to acquire knowledge specific to the target population, including lifespan development needs, health literacy levels, resource infrastructure, employment and other associated social determinants (Jayasuriya et al., 2012).

Maternal and infant health outcomes are underscored by social, economic and environmental determinants of health, in which having reliable epidemiological data on the background of the target population and health service is critical. When improving the sexual and reproductive health of women to promote safe motherhood. It is considered mandatory to provide essential learning outcomes that are aimed towards improved care during puberty, menstruation, pregnancy, childbirth and puerperium, as well as promoting safe birth outcomes (Bintabara et al., 2015). In addition, to improve the quality of maternal and infant intra-partum care, the effect of geographical location
(such as remoteness and accessibility) and shortage of skilled workers must be addressed (Andrew et al., 2014; Vallely et al., 2013).

Implementing effective intrapartum care should be considered in the long term as a means of reducing health indicators at national and regional level (Campbell & Graham, 2006). However, Lawn, Tinker, Munjanja and Cousen (2006) argued that, while intrapartum care indicators can be used, from a long-term perspective, they may not be the best option for reducing maternal and infant mortality rates in many rural and remote communities, where mortality is high. Instead, improved infrastructure and up-skilling of targeted health professionals are critical to improve the health of the population in regard to health risks, vulnerability and health-seeking behaviours during prenatal, antenatal and postnatal periods in low-resource countries, such as Nepal (Lawn et al., 2006).

In PNG, the health outcomes associated with health system strengthening are only considered effective for those who can attend antenatal services, but not for those who cannot access services due to remoteness (Andrew et al., 2014; Vallely et al., 2013). In PNG, it is estimated that 85% of the population live in rural areas and, for the country to meet its MDGs, development plans for rural communities must be effectively implemented (Department of Health, 2009). In PNG, obtaining and sustaining a sufficient and skilled workforce to care for the rural majority and urban disadvantaged remains a major issue, especially when it is caused by an imbalance in the geographical distribution of health workers. A PNG-based qualitative study sample of rural health workers and associated job satisfaction of 344 nurses in rural communities found that the plans implemented by AusAID and the PNG Health Department to address staff shortages and improve dilapidated health facilities were not considered significant by nurses to attract them to work in rural facilities. The study found that improving the
work climate and workplace with constant supervisory visits and support from supervisors provided the job satisfaction needed for nurses to work in these remote rural communities, thereby improving quality of care (Jayasuriya et al., 2012). Healthcare professionals remain the cornerstone and drivers of healthcare; thus, if their skills, clinical experience and expectations are poorly suited to serve the health needs of the population, healthcare will deteriorate, as indicated in the increased rate of poor outcomes for the most vulnerable mothers and infants (WHO, 2015a). Educating and supporting nurses and midwives, as the frontline workers, is crucial for delivering safe and efficient care.

The following section of this chapter elaborates on the development of midwifery nursing education in PNG, followed by a discussion of the rationale for developing the PNG combined midwifery and child health nursing program.

2.6.1 The role and scope of practice of the nurse midwife in PNG. The International Confederation of Midwives (2014) defined a midwife as a:

person who has successfully completed a midwifery education that is recognized in the country where it is located based on ICM essential competencies for midwifery practice and framework of ICM global standards for midwifery education and has acquired qualifications to be registered or licensed to practice as midwives. (p. 1)

Midwives in different countries differ in their scope of practice for providing safe and efficient care for women during pregnancy and childbirth, and ensuring timely prevention and management of complications, depending on the context of the health facility and availability of a skilled workforce. However, generally, midwives are the first point of contact when rendering care to women and their families during pre-pregnancy, pregnancy, birth, postpartum and the child’s early weeks of life (UNFPA,
As an international association, midwives globally advocate for the provision and effective education of skilled attendants during births in order to reduce the global burden of maternal mortality and promote safe birth outcomes (International Confederation of Midwives, 2014).

The role specification of a midwife in PNG varies depending on their job description and area of practice. Although the majority of midwifery graduates are employed in obstetrics- and gynaecology-related clinical areas, mainly in urban settings, others are employed in educational settings, administration or clinical areas that are not relevant to their education as midwives, which leaves a gap in remote rural settings, particularly in terms of needing more skilled attendants during births.

This definition of the midwife and the role they play as professional skilled birth attendants excludes TBAs or VBAs who work in an unrecognised context and define themselves as ‘midwives’ (WHO, 2006). There are differences in the roles and responsibilities of midwives and maternal and child health nurses. A maternal and child health nurse ensures continuity of care from the prenatal period to when the child reaches five years of age. In contrast, a midwife provides care for women from the prenatal period and then for six weeks of the postnatal period (or when the newborn is 28 days old) (International Confederation of Midwives, 2014)

In low- and medium-income countries, 34% of all births are unsupervised by healthcare professionals; however, there has been a steady rise in birth supervision, from 47% of all births in 1990, to 62% in 2008. This is in comparison to high-income countries, where 99% of births are supervised by skilled birth attendants (WHO, 2015a). In PNG, the most recently available data indicate that, in 2011, 53% of births were attended by skilled health attendants (nurse or midwife), with the majority of mothers—especially in remote rural areas—still giving birth unattended (WHO & National
Department of Health, 2012). The doctor to patient ratio of 1:10,000 and midwife to women of 1:1,000 in 2010 remains far short of providing sufficient maternal and infant care to the PNG population (WHO & National Department of Health, 2012). It has been contended that the low number of skilled health workers is due both to the increasing population and diminishing health workforce (WHO & National Department of Health, 2012). Further, currently in PNG, there are insufficient numbers of skilled obstetric medical practitioners; therefore, midwives are trained to attend to emergency and other lifesaving procedures, with referrals for doctors to attend major complications and emergencies that require surgical interventions (National Department of Health, 2015).

Currently, midwifery education programs in PNG are mandated by the Education Committee of the Nursing Council of PNG to have a ratio of 40:60 for theory to clinical hours. These programs are required to have 1,760 total curriculum hours devoted to preparing a competent and clinically able midwife. This requirement is designed to assure safe practice in the delivery of care by midwives in the obstetrics and gynaecology clinical units in hospitals. Other midwifery graduates find work in managerial positions, both in hospitals and rural communities, while very few midwifery graduates work in rural community health settings (National Department of Health, 2015).

In PNG, midwifery programs have been conducted for the last three decades (1985 to 2015), yet the number of midwives educated remains inadequate to address PNG’s maternal and infant morbidity and mortality outcomes, as outlined above. This was further supported by the registered nurses who played the role of maternal and child health nurses and few midwives depending of the locality of the health service in particular, health centres and sub-health centres. To support midwives and maternal and child health nurses, health extension officers (HEOs) were educated and designated as
the officer in charge of rural health centres and sub-health centres (see Appendix 1). The employment of HEO’s in the rural health facilities were for the purpose of overseeing the operations of maternal and child health monthly clinics, and treating sick patients in the districts, thereby bringing health services closer to the community. The HEOs were trained in medical model to perform general minor procedures and make decisions in rural health facilities, before referring patients to specialist care in major hospitals. The presence of maternal and child health nurses and HEOs at the district level caused considerable improvements to the health of rural populations (Reid, 2006). However, PNG’s rural health facilities reduced their functions due to a shortage of trained health personal and resources, with some facilities closed for the last three to four decades (Government of PNG, 2010). This has created barriers to the availability and accessibility of health services for 85% of PNG population in 2008 lived in rural areas (AusAid, 2012).

2.6.2 PNG’s maternal and child health programs. In PNG, nursing was first introduced with a focus on maternal and child health in the 1950s by missionaries, when they arrived and settled in the country. Also in the 1950s, maternal and child health nurses undertook monthly visits to various remote rural villages, often on foot, to conduct immunisation, family planning and antenatal clinics, and assess the growth of babies and children with weight and height measurements (Reid, 2006). This program was later replaced by the PNG National Department of Health’s general nursing and midwifery programs around the country, aimed at reducing maternal and infant morbidity and mortality by providing safe care. However, this upgrade of the education status of nurses and midwives has made no significant difference to maternal and neonatal outcomes, with PNG still ranking high compared to other countries in the region. In 1999, in recognition of the high maternal and infant mortality reported in the
1996 demographic health survey, the shortage of a skilled workforce and the National Department of Health policy to staff one midwife in each centre; the University of Goroka developed and conducted the Bachelor in Clinical Maternal and Child Health Program with aim of placing skilled midwife and child health workers in community health posts—notably, health centres (National Department of Health, 2013; UNFPA, 2011; National Department of Health, 2009).

In 2005, a postgraduate double major combining midwifery and child health was offered in PNG as the BCMCH program at University A, Divine Word University, University of PNG and Pacific Adventist University. The Divine Word University offered a Bachelor in Midwifery that commenced in 2003, while the University of PNG offered a Bachelor in Midwifery and Paediatrics that commenced in 2005, and the Pacific Adventist University offered a Bachelor in Maternal and Child Health in 2005. However, this was discontinued one year later, and the university only offered a Bachelor in Nursing and Clinical Midwifery (Kruske, 2006). University A’s program was unique to the other PNG universities because it trained VBAs and VCHWs to act as the first point of call for villagers in remote regions. This aligned with AusAID’s priority attempt to improve health services and focus on improving the knowledge and skills of health workers in midwifery, child health and sexual and reproductive health (Australian Government Department of Foreign Affairs and Trade, 2009).

Through its BCMCH, University A was specifically involved in training VBAs and VCHWs, with the aim of creating partnerships with community leaders (councillors) and their community to reduce maternal and infant morbidity and mortality. The VBA and VCHWs were taught to identify risk factors in pregnant women and sick children, and refer them to the nearest health facility. Another major aim was to identify the associated contributing factors to ill health in the community
and promote “healthy homes” or “healthy living” adapted from the Healthy Island Concept (Puka & Chen, 2000). Instead of using rural health centre practice as a component of the PNG midwifery and general nursing curriculum, University A’s BCMCH students lived in the community with people, learning about their culture and daily lives in order to better understand the factors contributing to their health behaviours.

In addition to the above, University A’s BCMCH-trained multi-skilled nurses who could work in both obstetric and paediatric units, and were best suited for rural locations (University of Goroka, 2008). The core units of HIV/AIDS counselling and testing in University A’s curriculum were mandated with an accreditation (certificate) that was given in addition to the standard degree of conferment. VBAs and VCHWs were also trained to identify sexually transmitted infections (STIs) using the ‘syndromic management approach’, which resulted in many of the targeted population being referred for further treatment for infertility and sexual health issues. A syndromic approach is a way of diagnosing sexual transmission infections by recognising the collective signs and symptoms presented by a client with STI infections. Villages that were involved in University A’s BCMCH program attested to the improvements created by the program, and reported an increased attendance for HIV/AIDS testing at provincial hospitals (Eastern Highlands provincial Health Authority, 2013)

2.6.3 Development and evaluation of VBA and VCHW training programs.

Globally, TBA training programs started in the early 1970s, when maternal mortality became a major concern in low-income and resource-poor countries due to a lack of skilled care during birth (Sibley et al., 2007). In 1970, in order to alleviate the documented shortage of skilled midwives and healthcare workforce, the WHO promoted and initiated the training of TBAs to reduce maternal and infant mortality.
TBAs were trained to advise women in their communities about nutrition and immunisation; distribute folic acid, iron tablets and antimalarial tablets; and teach them to practice hygienic deliveries (Sibley et al., 2007). A TBA was defined as a ‘person (elderly) usually female over 40 years who assist the mother during childbirth, initially acquired skills by delivering babies herself or through apprenticeship and not formally trained’ (WHO, cited in Sibley et al., 2007, p. 4).

In early 1980, PNG’s National Health Department embraced safe motherhood by targeting and training VBAs. A VBA in the regional Asia Pacific index is defined as a ‘woman in the community whether married or single, illiterate or non-illiterate, recognized and appointed by the community leader to represent women in the community to be trained and equipped with safe birthing kits and information on safe births’ (Alto et al., 1991; Duke et al., 2015). In PNG, many of these birth attendants were trained by NGOs, individuals or religious organisations, with the aim of improving birth attendants’ knowledge and skills for safe motherhood.

In PNG, the number of skilled birth attendants increased from 39% in 2000 to 53% in 2009 (UNICEF, 2009); however, this has not corresponded to improvements in the number of births supervised as the number of birth attendants were still in inadequate for the increasing population. In 2009 in PNG, deliveries in hospitals and health centres accounted for 52% of births, which meant that 48% of deliveries in rural populations were given minimal or no supervision. Women in remote rural areas were still reported to be largely delivering unsupervised due to remoteness (UNICEF, 2009). In Papua New Guinea the training of village birth attendants aimed to alleviate a health workforce shortage in rural areas. A shortage of a skilled health workforce has been experienced in many countries in similar stages of development, such as Bangladesh.
Since 2009, PNG has been the target of considerable development assistance by foreign governmental agencies, such as the WHO, AusAID, UNFPA, UNICEF and World Bank. In addition, each year, the PNG government has allocated considerable money to priority areas, such as health and education, to implement strategies outlined in the PNG Strategic Development Plan to reduce maternal and infant morbidity and mortality. This encompasses preventable diseases, such as tuberculosis and HIV/AIDS (Department of Health, 2009). It remains important to conduct effective evaluation of tertiary education health service delivery programs and health service providers to determine whether the money spent addressing these strategies is effective in terms of outcomes, health and social effects, and sustainability. Of particular importance is exploring why maternal and infant morbidity and mortality remain a major health concern, especially in remote rural communities.

Reducing maternal mortality requires comprehensive interventions that acknowledge the importance of culture, language, transport, distance to health facilities, the educational preparedness of health service staff (both skilled and unskilled) and the attitude and behaviour of service providers (Vallely et al., 2013). PNG’s spatial concerns regarding transport, distance and road access to healthcare facilities are also experienced in other regions, such as Guatemala (Owen, Obregon & Jacobson, 2010) and Sulawesi in Indonesia (Assan, Assan, Assan & Smith, 2009). This remains a significant barrier to improving health targets. In PNG, the National Department of Health and development partners have tended to focus on developing urban areas and providing accessible facilities; however, 85% of the PNG population lives in remote rural areas, and remains underserviced. This large portion of the PNG population
requires more consideration (Australian Government Department of Foreign Affairs and Trade, 2009).

The current subsection of this literature review on PNG-based VBA training has indicated only a few studies directly related to maternal mortality reduction, while a number of studies have focused on improving health education and practice for women and children (Byrne & Morgan, 2011). VBA training in PNG was conducted in the Nipa District of the Southern Highlands, Wosera in East Sepik, Finschaffen and Naweb electorate in Morobe Province, and Milne Bay Province. The training in the Wosera (coastal) area focused on the role of village midwives in helping reduce childhood pneumonia by giving preventive health education and medications, such as antimalarial and iron tablets (Byrne & Morgan, 2011). In contrast, the Nipa VBA training (highlands) focused on attending and supervising deliveries, after it was found that women in the area usually gave birth alone. The results of the study on Nipa VBA training showed an 11% reduction in infant and perinatal mortality (Alto et al., 1991). In the Milne Bay (coastal) training, one study aimed to examine the effect of changes using a traditional birth, with the aim of improving village births consistent with the culture (Poschl & Poschl, 1985). Of note is that the Milne Bay training was not related directly to tracking maternal or infant mortality rates (Poschl & Poschl, 1985). The VBA training program conducted in the Rabaraba district (Milne Bay) was for VBAs to provide care and support to women during pregnancy and childbirth (Bettiol, Griffin, Hogan & Heard, 2004). From 1987 to 1991, Project Concern International also participated in training 215 VBAs, with a focus on antenatal care, and identifying high-risk pregnancy and referrals for health facility births. The training programs outlined for VBAs were supported and trained by NGOs such as UNICEF, Safe Motherhood and WHO initiatives (Poschl & Poschl, 1985). Although training of VBA were conducted in
many parts of PNG and these VBAs cannot substitute professional care providers, they can contribute to the survival of mothers and newborns, and enable referral for access to health facilities and support.

2.7 Gap in the Literature

This literature review has outlined PNG’s implemented interventions to reduce maternal and infant morbidity and mortality through increasing and up-skilling the heath workforce (nurses, midwives, VBAs and VCHWs), together with improving the capacity of the educational curriculum, so that knowledge and skills transfer can be effective. This literature review has indicated that educated women are able to make informed choices about health outcome for their families. As frontline healthcare providers, nurses and midwives are actively involved in the transfer of knowledge and clinical skills to women and their families. However, many women and children remain underserved in remote rural communities in resource-poor settings, such as PNG. To address the health of rural mothers and their families, it is critical to understand the social determinants of health issues and their relationship to morbidity and mortality indicators in order to enable effective knowledge and clinical skills transfer.

In PNG, the purpose of developing University A’s BCMCH curriculum was to improve the knowledge and skills of the maternal and infant healthcare workforce in order to enable effective knowledge and skills impartation and improve target population health outcomes. The PNG ministerial taskforce recommended that the curriculum for maternal and child health undergo a WHO-commissioned review in 2006; however, University A’s program only commenced in mid-2005. Thus, the review was undertaken before the program had reached maturity (Koplan, 1999). Kruske’s (2006) report argued the need to modify the curriculum for midwifery training to address the
country’s problems, yet predicted that these modifications would only meet the needs of the urban population, while the rural population still had to be considered.

In PNG, with substandard health facilities and most sub-health centres closed, maternal and infant mortality will continue to increase unless community partnerships and involvement are used by the PNG government and National Department of Health (Government of PNG, 2010b). Another gap in the literature is that, while many tertiary educational institutions have provided health education programs for various health professionals, the PNG educational and nursing sector are yet to develop a competency-based higher education curriculum that meets the healthcare needs of stakeholders, especially the remote rural majority. The strengths and weaknesses of the transfer of knowledge and skills from the educational curriculum in this study (University A’s BCMCH curriculum) to stakeholders (BCMCH graduates, VBAs, VCHWs and postnatal women) in the educational and community setting has never had a long-term comprehensive outcome evaluation. A successful outcome-based program evaluation must include evidence of the merit (quality) and significance from all stakeholders’ perspectives if PNG is to achieve MDGs 4 and 5 and its targeted KRAs (see Chapter 4).

The current study sought to examine the effect of the BCMCH curriculum on knowledge and skills transfer, based on a modified program evaluation framework for educational programs, postulated by Kim et al. (2009). The study further aimed to examine the strengths and weaknesses of the knowledge and skills transferred to improve the healthcare knowledge of the end recipients (PNG’s remote rural maternal and infant population). The curriculum content evaluation assessed how the program was implemented, and its ‘merit (quality) and significance’ from the perspectives of the targeted stakeholders and healthcare consumers (Koplan, 1999; Owen, 2006). The curriculum evaluation objectives were modified from Kim et al.’s (2009) rotational
evaluation of curriculum and resources methodology, based on PNG’s cultural, geographical, health and education attributes.

2.8 Conclusion

This chapter has highlighted key studies in curriculum knowledge, skills transfer and evaluation of learning outcomes, and indicated the importance of evaluating curriculums to enable improved outcomes—especially for health curriculums. This chapter has provided critical evidence of the role of registered nurses/midwives in knowledge transfer, particularly in low-resource settings. In addition, this chapter has highlighted the gap in the global and local literature on health program evaluation. Of critical importance is the absence of systematic program evaluation of PNG’s University A BCMCH from the perspective of all key stakeholders. It is essential to conduct an empirically-based study with a modified program evaluation of the educational effect of University A’s program on all stakeholders, in order to determine whether the transferred knowledge and skills reached stakeholders and resulted in changes in their health behaviour and outcomes.

The deadline for meeting MDGs 4 and 5 by 2015 at the time of thesis’s data collection were significant challenge for low-resource and low-income countries, where many of the underlying social determinants had not been addressed. The literature has highlighted the critical importance of transferring curriculum knowledge and skills through a sequential series of stakeholders to the end recipients. This chapter has reviewed the complex, multiple educational and healthcare outcome strategies employed in low-resource settings, and the extent to which these have met MDG 4 for improving child survival and MDG 5 for improving maternal health. The focus of this chapter was to review the empirical literature on up-skillling the key healthcare workers and tertiary education providers involved in these developmental targets. The literature
review from PNG revealed that one such strategy from the National Department of Health was the historical upgrading of nursing programs offered as tertiary education programs. University A developed and conducted a BCMCH that incorporated VBA and VCHW training to provide semi-skilled birth attendants and child health workers to remote rural communities. The central aim of this was improving the health of women and children in resource-poor settings.
Chapter 3: Methodology

3.1 Introduction

This study employed a descriptive exploratory design that used a retrospective approach. The descriptive exploratory design used in this qualitative research examined the subjective meaning of attributes from a specific cause—the effect of a set curriculum on individuals and a group (Flick, 2014). A qualitative research approach was imperative because it provides analytic, subjective meaning to issues, events and practice by collecting non-standardised data and analysing text (Flick, 2014). Qualitative research uses an unstructured approach, whereby the objectives and design of the study enable flexibility in all aspects of the process undertaken when conducting the research, and is used to explore and describe the nature of the event or issue under study (Kumar, 2005). Qualitative research commonly employs in-depth interviews to allow participants to freely express their feelings and perceptions in a continuous and more interactive manner, which enables concurrent alterations as the research proceeds (Bouma & Ling, 2006).

This study sought to critically analyse the educational effectiveness of strategies used in the BCMCH that was offered from 2005 to 2009 at University A, using an evaluation research framework (Metcalfe et al., 2008; Owen, 2006). This study chose to employ a qualitative, descriptive, four-phase study design to examine how and in what ways knowledge and skills were transferred to graduates, who transferred them to VBAs and VCHWs, who ultimately transferred them to rural women. Further, this study employed a retrospective approach because the proposed cause and effect had already occurred, and the present phenomenon was linked to what happened in the past (Burns & Groves, 2009; Schneider, Whitehead, Elliott, LoBiondo-Wood & Haber, 2007), given that the BCMCH was offered from 2005 to 2009 at University A.
3.2 Program Evaluation

Program evaluation addresses the requirements for quality assurance and meets statutory education requirements in the country of origin—in this case, PNG. Program evaluation is a well-recognised methodology by internal and external evaluators in aid and development research for rigorous quality assurance, with stakeholder-based learning outcomes. It is a key instrument for demonstrating curriculum quality in terms of program module mapping, assessment and valid demonstration of student achievement in the case of by health program evaluators (Ovretveit, 2007). Program evaluation aims to ensure streamlining and updating of modules and programs to generate highly focused, relevant, quality assured, easily understood learning outcomes (Owen, 2006). Essential are inputs from students and external sources (employers, professionals and lay people, such as mothers). Program evaluation aims to ensure all stakeholders have a clear articulation of program quality and development (Koplan, 1999). Programmatic reviews should occur at regular intervals. The review should include identifying and articulating good practice and quality enhancements at program level, highlighting possible need for change, encouraging openness and transparency, and using the program to inform other appraisal processes (such as professional reviews) to enable more equitable comparisons between programs (Koplan, 1999; Ovretveit, 2007; Owen, 2000).

3.2.1 Evaluation models. Since the 1950s, many different evaluation models had been developed, with refinement undertaken in response to development in order to improve these models. Among these models were Tyler’s (1950) objective centred model; Stufflebeam’s (1971) context, input, process and product model; Scriven’s (1972) goals fee model, Stake’s (1975) responsive model; Eisner’s (1979) connoisseurship model; and Bradley’s (1985) effective model. Stufflebeam’s (1971)
model and Owens’s (2006) formative, process and summative program evaluation informed the current study. The current study used an eclectic process because University A’s BCMCH did not have all the components of the previous models to aid the evaluation suggested by Stufflebeam’s (1971) model. This eclectic approach (Ferrero, 2006) made provisions for written (content), taught (objectives), supported (resources), tested (assessment) and learnt (impact) or outcomes to be evaluated through knowledge transfer to stakeholders. Therefore, a modified eclectic programme evaluation approach was undertaken in this study.

In public health program conducting programme outcome evaluation serves as a driving force for planning effective public health strategies, improving existing programs and demonstrating the results of resource investment (Koplan, 1999). This study engaged the summative or impact component phase of program evaluation design. Curriculum content evaluation was used to assess how the program was implemented, and to determine the ‘merit or the quality of the program by examining the strength and weakness of the program delivery. It was also to examine what significant impact the program had on the targeted stakeholders in this case the mothers and their children in rural Papua New Guinea (Koplan, 1999, p. 8). The impact component drew on the retrospectively perceived strengths and weaknesses in knowledge and skills transfer from graduates to VBAs and VCHWs, with the long-term aim of empirically informing enhancement of the previous program in order to improve maternal and infant health outcomes. To achieve this, a four-phase study was undertaken with the following components:

- Phase 1: curriculum analysis
- Phase 2: face-to-face semi-structured interviews with University A’s BCMCH graduates
• Phase 3: focus group interviews with VBAs and VCHWs
• Phase 4: face-to-face interviews with postnatal women.

3.3 Phase 1: Curriculum Module Analysis

3.3.1 Introduction. Program evaluation is designed to attribute value to the characteristics of study. Scriven (1991, cited in Owens, 2006) suggested that evaluation is a ‘process of determining the merit and worth or value of a product’ (p. 10). Objects for evaluation might be a program, policy, product or service, with the analysis conducted at mega, macro or micro level, depending on the type of evaluation (Koplan, 1999; Owens, 2006). Evaluation may be undertaken formatively during program development or implementation (process), or towards the end for impact or outcome evaluation.

3.3.2 The subject of an evaluation. The two-component curriculum for the BCMCH implemented from 2005 to 2009 at University A was evaluated in this study. This two-component curriculum prepared BCMCH students with the skills and knowledge to practice competently and transfer knowledge to VBAs and VCHWs. From the total of 16 subjects taught in both components, this study evaluated the following seven modules that informed VBA and VCHW urban and rural community practice:

1. foundations in maternal health
2. foundations in child health
3. advanced maternal health
4. advanced child health
5. village maternal health experience
6. village child health experience
7. community rural/urban maternal and child health issues.
University A’s post registration BCMCH course consisted of 40% theory and 60% practicum in both hospital and community settings, and was delivered over a one-year full-time period (Unpublished University of Goroka Curriculum for Bachelor Maternal and Child Health, 2008). The course was taught by academics with postgraduate qualification in nursing and midwifery. Clinical supervision was provided by the same academics with support from qualified midwives and paediatric nurses.

The child health component of the course was taught in the first semester, while maternal health was taught in the second semester. Each semester had 26 weeks, consisting of 12 weeks of theory and 14 weeks of practicum. The 14 weeks of practicum included four weeks of rural/community practice, and 10 weeks of hospital and urban clinic practice. An additional period of eight weeks was given for students to work in a clinical setting in order to complete their competencies. University A’s BCMCH was conducted as a one-year program; however, in reality, the entire program took 18 months to complete. During implementation of the program, students identified time limitations to completing their competencies; therefore, arrangements were made for students to return to their places of employment to complete their competencies. Students were required to complete their competencies in order to register with the regulatory body—the Nursing Council of PNG (Nursing Council of PNG, 2003).

3.3.3 Framework and procedure for evaluation. Content evaluation of University A’s 2005 to 2009 BCMCH curriculum was undertaken of all teaching materials relevant to BCMCH preparation and VBA and VCHW training (Metcalf et al., 2008; Schneider et al., 2007; Whittaker & Williamson, 2011). Using the keyword search of ‘learning outcome, content, teaching methods, assessment tools’

A curriculum evaluation tool adapted from Curtin University guided the evaluation of the BCMCH curriculum in Phase 1 of this study. The unit learning
outcomes (ULOs) for each module were transferred from University A’s curriculum. These ULOs were measured against the graduates’ competencies, derived from the PNG Specialist Nursing Competency Standards for Child Health and Midwifery (Nursing Council of PNG, 2003 a & b). This study considered the main factors influencing learning outcomes, assessment, experiences and resources. It used these factors to identify the strengths and weaknesses that may have evolved during the transfer of knowledge and skills during program implementation. Further, this study analysed and discussed the key pre-determined domains. The purpose of this phase was to evaluate the structural and process aspects of the curriculum in order to inform the transfer of evidence-based knowledge and skills on birthing practice to promote safe maternal and infant outcomes.

3.3.4 Inclusion criteria. The program examined was the curriculum for the BCMCH offered at University A. The specific content studied was from the seven subjects taught that related to community practice in both maternal and child health subjects, as discussed in detail in Chapter 4 of this study.

3.4 Rigour and Content Validity

The semi-structured interview questions were developed from the curriculum evaluation. When the interview guide had been developed content validity was applied through the use of two independent PNG nursing academics with midwifery and child health clinical backgrounds from two separate PNG universities. These experts then checked the curriculum content to determine whether they felt that the content was valid for the PNG context in the light of their expertise. The content validity also confirmed that those sessions were covered in the process of the BCMCH students learning (dependability and transferability).
3.5 Phases 2, 3 and 4

The following sections will separately discuss the aspects of Phases 2, 3 and 4: the research setting, methods of sampling, inclusion and exclusion criteria, development of interview guides, approach taken during data collection, recruitment process, content validity, piloting and analysis. These sections will also discuss the study’s ethical requirements. This study sought and obtained approval from the Ethics Committee of the PNG Department of Health’s Medical Research Advisory Committee (PNGMRAC) and RMIT University’s College Human Ethics Advisory Network (CHEAN) (see Appendix 2). Finally, these sections will conclude by outlining the necessary qualitative rigour all four study phases.

The three reported phases (Phases 2, 3 and 4) followed a sequential approach, with one phase informing the interview guide for the next, in order to address the initial research questions posed, which were as follows:

- What were the strengths of the previous educational module that was used to inform the training of the BCMCH students?
- What were the weaknesses of the previous educational module that was used to inform the training of the BCMCH students?
- What were the perceived strengths in the transfer of knowledge and skills to VBA and VCHW?
- What were the perceived weaknesses in the transfer of knowledge and skills to VBA and VCHW?
- What were the perceptions of the postnatal women regarding VBA training?
- What were the convergent and divergent themes identified from the different phases of the study?
Purposive sampling was employed in population sampling to capture the highlighted demographics (Schneider et al., 2007; Whittaker & Williamson, 2011). Although preferred, a total sampling approach was not possible because many targeted stakeholders were no longer in accessible contact, or had moved to new places of employment, both in the public and private sectors. Graduates volunteered to participate in the research study having first been invited by a third party. Purposive samples of 20 graduates were recruited from the 105 graduates; with 16 completing an interview with the researcher. Purposive sampling added a critical and empirical context to help understand the vast socioeconomic and cultural differences that may have affected participants’ practice (Schneider et al., 2007; Whittaker & Williamson, 2011), especially in PNG, with its 820 languages.

3.6 Ethical Requirements

Protecting the human rights of a researched population in the case of this study PNG VBAs and rural women, vulnerable population involved recognising and protecting the population under study and the access to the setting. Ethical safeguards for research are intended to guide the behaviour of the researcher and protect the participants from adverse outcome (Flick, 2014; Guthrie, 2010). Ethical approval from relevant authorities and permission from participants to undertake the research were important to protect the people in the PNG population, who have heightened vulnerabilities, particularly the right to privacy because of their illiteracy status and lack of understanding regarding their privacy rights.

In obtaining ethical approval for this study, ethical clearance was granted from the RMIT University’s CHEAN and PNGMRAC (see Appendix 2). Initially, the researcher sent provincial health advisors and chief executive officers in the Eastern, Western and Southern Highlands provinces an explanatory letter, seeking permission to
collect data from the BCMCH graduates employed in their health facilities. This also included a copy of RMIT University’s CHEAN and PNGMRAC’s ethics approval (see Appendix 2).

To obtain access to VBAs, VCHWs and postnatal women in the community (Phases 3 and 4), letters were written to community leaders and those with access to the participants to request invitation to visit the community to undertake the study. To protect the participants’ rights to confidentiality, privacy and anonymity (Flick, 2014; Richardson-Tench, Taylor, Kermode & Roberts, 2011), the researcher developed an explanatory letter and informed consent form written in plain English language (see Appendices 3, 4 and 5). The resultant letter and informed consent were then subject to forward- and back-translation (validity) from English to Pidgin (PNG’s national language) and then back to English to check the accuracy of the translation. There may have been minor loss of meaning when translation occurred as certain terms in English may not describe well in pidgin but kept the translation to be accurate as possible. These documents explained the purpose of the study, and enabled participants to sign to give their permission for the interviews to take place, as well as emphasising their right to withdraw and refuse any question in all three phases of the study. Those informants who were unable to sign (illiterate) were asked to mark or draw something on the consent forms. They were also informed that participating in the study was voluntary, they had the right to withdraw from the study without any penalty, and any information provided would be kept confidential (Richardson-Tench et al., 2011).

3.6.1 De-identifying informants. In order to de-identifying the informants, pseudonyms were allocated and used in the process of representing the quotations in this study. Furthermore data was generalised as either from the highlands or coastal
participants for phases three and four and not specifically the names of the provinces in PNG.

3.6.2 Data storage. All recorded information was kept safe in a locked file in the researcher’s local office and in a locked bag when on fieldwork. Copies of all consent forms were taken back by hand carriage in a locked bag back to the Australian university. All project associated data, digital audio recording, transcription, consent from and field notes are kept in the university archives for up to 10 years or more until it has no further value post data collection.

3.7 Phase 2: Stakeholder Group A—BCMCH Graduates

3.7.1 Introduction. The majority of graduates admitted to University A for the BCMCH were from the Eastern, Western and Southern Highlands and Milne Bay provinces, while a few were from other parts of the country. Community practice and VBA training (from 2006 to 2009) was conducted in the Eastern Highlands, Madang and a few border villages in Simbu province.

3.7.2 Sample and sampling. Purposive sample of BCMCH graduates was drawn from the 2005 to 2009 programs. Purposive sampling was used to recruit a total of 20 graduates from the 105 BCMCH graduates. From the total of 20 graduates who were approached, 16 agreed to participate in the face-to-face interviews, while two indicated that they were busy; one stated that her English was insufficient to participate, and one did not turn up for the interview. This sample was chosen because they were representative based on location and experience related to evaluating the effectiveness of VBA training from a trainer’s perspective.

3.7.3 Inclusion criteria. The inclusion criteria specified that the study participants must be BCMCH graduates from University A from 2006 to 2009, who
were involved in training VBAs and VCHWs in either the highlands or coastal regions of PNG.

3.7.4 Recruitment processes. Initially, the researcher sent an explanatory letter to provincial health advisors and chief executive officers in the Eastern, Western and Southern Highlands provinces, seeking permission to approach the purposively sampled graduates. This also included a copy of RMIT University’s CHEAN and PNGMRAC’s ethics approval. These sites were selected because the majority of BCMCH graduates were working in these provinces. The same explanatory letter and a letter of invitation were sent to the nursing directors who were immediate supervisors of the graduates to inform them of the intended research. Participants who were interested in participating in the interview were then invited to collect the letter of invitation and schedule for data collection (see Appendix 2).

3.7.5 Semi-structured interview guide. A semi-structured interview guide was developed from the results of the analysis of Phase 1 and review of the existing literature. A total of 17 semi-structured questions guided the face-to-face interviews in Phase 2. These questions related to the training module, professional placement in hospitals and the community, assessment, learning experiences and learning resources (see Appendix 3).

3.7.6 Content validity. An expert panel consisting of academics with midwifery and child health clinical backgrounds assessed the semi-structured questionnaires to review the content, and modifications were made based on the suggestions provided. This process ensured that the content of the guide was appropriate for the concepts examined in the main study (Gerrish & Lacey, 2010; Schmidt & Brown, 2009).

3.7.7 Pilot study. After examining content validity, a pilot study was conducted with informants who met the inclusion criteria, independent of the main study. The pilot
study was conducted with three BCMCH graduates from different years of admission or training. The aim was to examine the relevance, timing and understanding or ambiguity in the semi-structured interview guide. The pilot study enabled refinement of the questions to avoid pitfalls during the formal study (Gerrish & Lacey, 2010). Changes to the interview guide were subsequently incorporated in the main interview guide for Phase 2.

3.7.8 **Approach and data collection.** Face-to-face interviews were conducted using the piloted semi-structured questionnaires (Houser, 2012). The interviews were conducted in English and took place at a date and time set by the participants, in an office space in the hospital, college of nursing or designated health clinic. Prior to beginning the interview, the researcher verbally explained the purpose of the research and emphasised to the participants that they could withdraw from the study if they did not wish to participate, without any penalty (Schmidt & Brown, 2009). Demographic information was also obtained at the time of the interview. Concurrent data analysis (Kumar, 2005) was employed, with the results of one interview informing the next interview guide, until saturation of data was achieved (Parahoo, 2014). Each face-to-face interview lasted for approximately 30 to 60 minutes. Upon reaching data saturation through concurrent analysis, 16 participants had completed the study. Data saturation was achieved when no new information was discovered in the interviews (Kumar, 2005).

3.7.9 **Data transcription and analysis.** Data transcription for this phase of study was undertaken by the primary researcher and, at a later stage, by an OutScribe company (Alvesson, 2011). The next phase involved reading, rereading, intuiting, analysing, synthesising and identifying the subthemes (Houser, 2012). The main themes and subthemes were then coded into categories and subcategories to eventually define
and name more concrete themes for discussion (Gerrish & Lacey, 2010; Whittaker & Williamson, 2011). Eleven themes evolved from the analysis to inform the development of the semi-structured interview questionnaires for Phase 3, which is further discussed in Chapter 5. The main themes were also incorporated into the final stage of between- and within-analysis, as discussed in Chapter 8. Demographic data from this phase were analysed with simple descriptive statistics.

3.8 Phase 3: Stakeholder B—VBAs and VCHWs

During University A’s BCMCH, it was mandatory that each student train between one to two VBAs in a designated village in both midwifery and child health knowledge and skills. University A’s BCMCH training specifically targeted rural and remote geographical locations, and regions with different language and cultural backgrounds.

3.8.1 Sample and sampling. Purposive sampling (Schneider et al., 2007; Whittaker & Williamson, 2011) of matched VBAs and VCHWs directly trained by BCMCH graduates in 2006 to 2009 was undertaken to recruit these VBAs and VCHWs specifically from the highlands and coastal regions of PNG. The focus group discussion occurred between June and August 2013. The semi-structured interview guide developed in Phase 2 of the study (see Chapter 5) guided these focus group interviews.

3.8.2 Inclusion criteria. The inclusion criteria encompassed VBAs and VCHWs trained by BCMCH graduates from the following districts: Ungaii and Lufa in the Eastern Highlands province, and Aronis in Madang province. VBA training was done in different communities and geographical locations, and among people with different language and cultural backgrounds.
3.8.3 Exclusion criteria. The exclusion criteria encompassed TBAs who had been practising as VBAs, and VBAs trained by other organisations than University A’s BCMCH program.

3.8.4 Setting. Data collection occurred in Unggai and Lufa districts in the Eastern Highlands province and Aronis in Madang province. These settings were chosen because these were the areas where University A’s bachelor students were sent to live in the community to train VBAs and VCHWs as part of their community practicum. The settings selected were located in the highlands and coastal regions, with language, geography and cultural differences reflecting the cultural and linguistic diversity of the 820 languages of PNG.

3.8.5 Semi-structured interview guide. In Phase 3 of this study, a semi-structured interview guide was developed from the results of the analysis of Phase 2 and review of the existing literature. A total of 11 semi-structured questions were developed related to knowledge and skills transfer to enable positive community health outcomes. These questions guided the three focus group discussions (see Appendix 4).

3.8.6 Content validity. An expert panel consisting of three PNG nurses with midwifery and child health clinical backgrounds and experience in VBA training viewed the semi-structured questions guide. Suggested modifications were made to ensure that the information corresponded with the study aims (Gerrish & Lacey, 2010; Schmidt & Brown, 2009).

3.8.7 Piloting. In Phase 2, piloting was conducted on a group of six VBAs in another district (Daulo), independent from the main study. These VBAs were also trained by BCMCH graduates. This was done to examine the semi-structured questions for timing and ambiguity prior to collecting data. Any issues noted in the interview
instruments were corrected and incorporated in preparation of the main interviews (Brown et al., 2006).

3.8.8 Approach for data collection. A total of three ethnographic focus group interviews were conducted in Pidgin (creole language) using the piloted semi-structured questions. Focus Group 1 (highlands) had seven participants, Focus Group 2 (highlands) had six participants and Focus Group 3 (coastal) had seven participants. The questions were drawn from analysis of Phase 1 and Phase 2 data, and a review of the literature with local adaptation (refer to Appendix 4b).

Each focus group interview was led by an experienced moderator (the primary researcher) and all discussions were recorded, with field notes taken. The researcher commenced by explaining the purpose of the study, and gained a signed written consent form prior to data collection. The researcher encouraged participation by everyone in the group during the discussion, ensuring clarification throughout the interview. Each focus group discussion took approximately one to 1.5 hours. Concurrent data analysis was employed for each focus group, with any changes noted and then incorporated in the next round of interviews (Brown et al., 2006). Demographic information was collected on a separate sheet collected from each VBA after the interview (see Appendix 4c).

3.8.9 Data analysis. Each focus group interview was conducted in PNG’s national language (Pidgin) using an audio recorder, with verbatim translation initially undertaken (Brown et al., 2006). Recorded interviews were then listened and re-listened to, and translated into English before transcription. The next step was arranging subcategories for development of themes. Field notes used to collect information were also analysed. Transcription and coding for broader themes was undertaken, and more concrete themes were identified (Brown et al., 2006). The data in this phase informed
the development of the interview guide for Phase 4. This was also incorporated in the final stage of data analysis for between- and within-analysis. Demographic data from Phases 2, 3 and 4 were analysed with simple descriptive statistics.

3.9 Phase 4: Stakeholder Group C—Postnatal Women

This phase of the study aimed to examine the perceptions of postnatal women regarding the care and support provided by the University A-trained VBAs and VCHWs/volunteers during their pregnancy and birth. The postnatal women’s perceptions were considered critical to inform improvement of VBAs’ and VCHWs’ safe care at the community level, where no midwives are present.

3.9.1 Sample and sampling. The research participants were recruited via snowball sampling (Houser, 2012; Schmidt & Brown, 2009). This was used to identify postnatal women who were delivered or attended by VBAs or VCHWs in the community from 2006 to 2009 (Phase 2). The researcher selected VBAs from the districts mentioned in Phase 3 with assistance from the community leaders involved in their training.

3.9.2 Inclusion criteria. The inclusion criteria encompassed all postpartum women of Ungaii and Lufa in the Eastern Highlands province, and Aronis in the north coast district (Madang) who received assistance or advice in terms of referral, childbirth or antenatal care from University A-trained VBAs and VCHWs/volunteers from 2006 to 2009.

3.9.3 Setting. Data collection occurred at Lufa and Ungaii districts in the Eastern Highlands province, and Aronis in the north coast district of Madang province. The selected settings were located in the highlands and coastal regions, where there are language, culture and geographical differences.
3.9.4 **Semi-structured interview guide.** In the final phase (Phase 4), a semi-structured interview guide was developed from the results of the analysis of Phase 3 (Chapter 6) and review of the existing literature. A total of 11 semi-structured questions were established (see Appendix 5c) in relation to antenatal care, birthing preparation and postnatal care. These questions guided the face-to-face interviews.

3.9.5 **Content validity.** An expert panel consisting of academics with midwifery and child health clinical backgrounds reviewed the semi-structured questionnaires to ensure the information corresponded with the aims of the study. The content of the pre-prepared questions was assessed for how well it could be understood and was relevant to the care received by postpartum women in the community under study (Gerrish & Lacey, 2010; Schmidt & Brown, 2009).

3.9.6 **Pilot study.** Piloting occurred, in which the semi-structured interview guide was administered to two postpartum women, who were delivered by a VBA in Daulo district. The pilot study was undertaken to check the relevance, timing and ambiguity of the questions, and to ensure the participants could understand the questions posed (Gerrish & Lacey, 2010). The pilot interviews further tested the reliability of the audio recorder in the remote humid and noisy location (Brown et al., 2006).

3.9.7 **Approach to data collection.** An ethnographic approach was used to engage in face-to-face interviews using the piloted, semi-structured guide (Gerrish & Lacey, 2010) to address the key research questions on the effectiveness of the curriculum in improving maternal mortality and safe motherhood in the community (WHO, 2011). The interviews aimed to assess the satisfaction of the VBAs’ and VCHWs’ delivered services as the first point of contact for community women’s maternal and child health needs.
All interviews were conducted in PNG’s national language (Pidgin). A total of 10 postnatal women were recruited, and all participated. The interviews were tape recorded and an audio trail of notes was taken. Clarification of meaning sought throughout each interview. Each interview took approximately 25 to 30 minutes. Concurrent data analysis was employed (Kumar, 2005) and any implications for changes noted in the interview guidelines were incorporated in the next round of interviews (Brown et al., 2006).

3.9.8 Data analysis. Prior to analysis, translation from Pidgin to English was undertaken, and then transcription occurred. The main themes and subthemes were then coded into categories and subcategories, which led to defining and naming more concrete themes for discussion (Gerrish & Lacey, 2010; Whittaker & Williamson, 2011). The demographic data from this phase were analysed with simple descriptive statistics.

3.10 Rigour

Rigour is established when there is no legitimate doubt produced in the data, and the findings are seen to represent the truth (Silverman, 2013). In qualitative research, the trustworthiness of the study to produce credibility, dependability, confirmability and transferability from the data are evident (Richardson-Tench et al., 2011).

3.10.1 Transferability. Interview questionnaires must produce transferability, reproducibility and similar results so that the participants can recognise that the findings reflect their true experience—in this case, they should reflect the participants’ true training experiences. Study findings should also be able to be used in other populations or future studies (Borbasi, Jackson & Langford, 2008; Houser, 2012; Parahoo, 2014). In this study, the audio tape records and notes reflected the credibility and conformability
of the data from the participants. The interviewer also used field notes, which provided a reliable record (Silverman, 2013).

3.10.2 Credibility and confirmability. Credibility and confirmability is achieved when participants recognise that the information in the findings reflects their true experience (Borbasi et al., 2008; Houser, 2012). In the reported study, time restrictions and issues with inaccessible locations meant taking a summation of the raw data back to the participants in each phase was not always undertaken. Of note however is that a component of the informed ethical consent ensured that the final research report would be available to the participants. To further ensure credibility and confirmability, two independent PNG nurse academics with midwifery and/or child health clinical backgrounds from two separate PNG universities checked the various phases of the semi-structured interview guide for content validity. These experts were asked to comment on how the interview questions represented the concept to be examined (Gerrish & Lacey, 2010), and their feedback was reflected in the semi-structured interview guide during subsequent study phases.

In Phase 3 involving the VBAs and VCHWs, this study employed independent member checking, which was undertaken by a nurse researcher with a community health background who was involved in VBA training. This researcher reviewed the pre-prepared semi-structured questions, and made amendments in consultation with the research supervisor.

All focus group discussions used audio recording to capture the views of all participants involved in order to achieve high face validity (Gerrish & Lacey, 2010; Whittaker & Williamson, 2011).
In Phases 2, 3 and 4, of each analysis when there was disagreement in the themes and subthemes developed during analysis of each phase, discussion took place with the research supervisors until agreement was reached to ensure trustworthy data.

3.11 Triangulation of the Study Phases

The final process of establishing rigour involved using a data triangulation method to compare and contrast the multiple data sources from the four phases of the study (Gerrish & Lacey, 2010)—the results of which are critiqued in detail in Chapter 8. Triangulation is an investigative strategy that combines data from different sources to generate evidence (Bekhet & Zauszniewski, 2012). Triangulation included the comparison and contrast of the main themes from the semi-structured interviews with the BCMCH graduates, focus group interviews with the VBAs and VCHWs, and face-to-face interviews with postnatal women in the community. The process of analysis involved ordering and organising the collected materials, rereading the data, breaking the material into manageable data, searching for relationships and grouping categories (Taylor et al., 2007). It also required further reflection and validation by the research team and researcher supervisor.

The following stages were conducted to promote triangulation:

- Stage 1: collecting and organising the main themes from the three study phases (Phases 1, 2 and 3) and entering data into a table
- Stage 2: translating and transcribing the data for each group, and then sorting and classifying them into groups and patterns to represent organisational, professional and personal themes
- Stage 3: searching for relationships in the data from all groups, and again categorising and grouping them into similar themes
• Stage 4: discussing the results from the different themes established, and seeking agreements and deviations in the information provided by the different groups.

3.12 Summary

This chapter has described the approach undertaken during the four phases of this retrospective study to examine the strengths and weaknesses of the transfer of knowledge and skills. This chapter has described the purpose of conducting a modified program evaluation, and the rational for the current study to use the retrospective summative and impact component of the evaluation. Further, this chapter has described the approaches undertaken to conduct the participant sampling and recruitment; development of the interview guides for each phases; and associated piloting during each phase prior to data collection, transcription and analysis. Ethical approval was sought through the human ethics committee of the university concerned, and from the PNGMRAC.

This four-phase study was conducted in a sequential manner, whereby the analysed data from one phase informed the next phase. This was done in order to examine the transference of theoretical knowledge and clinical skills from the university curriculum. The following chapters discuss these four phases of data collection and the associated supportive literature. Chapter 4 describes Phase 1, which evaluated the curriculum by mapping University A’s 2005 to 2009 BCMCH curriculum using the Curtin University mapping tool. Since one phase informed the next, the semi-structured interviews for each phase were formulated from the main themes identified in each previous phase. Chapters 5, 6 and 7 will present the testimonies of the three stakeholder groups regarding their perceptions of the strengths and weaknesses of the acquired knowledge and skills from one stakeholder to another. Chapter 8 presents the discussion
commencing with a summary of the convergent and divergent themes from the three stakeholder groups, which is then compared and contrasted with the literature in the light of the initial research objectives. This chapter then notes the study limitations and the use of modified program evaluation in the PNG context (low resource). The final chapter, Chapter 9, presents the study’s conclusions and recommendations.
Chapter 4: Curriculum Based Transfer of Knowledge and Clinical Skills

4.1 Introduction

Identifying and developing the themes for this study were underscored by the research questions integrated into the four main study phases. One of the primary aim of research was to examine the strengths and weaknesses in the transfer of maternal and child health knowledge and skills from University A’s BCMCH curriculum (2005 to 2009) to BCMCH students, VBAs and VCHWs, and to consider how these attributes affected the recipients of the educational program.

To identify the relevant curriculum content, a curriculum evaluation tool adapted from teaching and learning at Curtin University (nd) guided the review of the BCMCH curriculum in Phase 1 of this study. This chapter will demonstrate the development of themes from the curriculum mapping process. This thematic development informed the semi-structured interview guide for Phase 2 with the BCMCH graduates (Chapter 5).

4.2 Maternal and Child Health Curriculum

Maternal and child health program was established in 1907 in New York (Margolis, Cole & Kotch, 1997). This formative program was developed with the aim of improving hospital facilities and educating doctors, nurses and midwives in providing aseptic delivery technique, reducing obstetric risk and reducing infant mortality, which was high at that time (Margolis et al., 1997). Since then, maternal and child health programs have been delivered as recognised health service programs in many health facilities and universities globally.

In PNG, the first maternal and child health program was introduced as a public health activity in 1940. The early iteration of the program provided antenatal care,
family planning and immunisation through ‘well baby’ clinics in urban and rural settings (Reid, 2006). In 2010, the National Department of Health incorporated maternal and child health activities as a key priority area (KRA) for implementation. The Papua New Guinea National Health Plan 2011 to 2020 introduced a number of KRAs with the priority objectives to be fulfilled by 2020 (Government of PNG, 2010a). Although all of PNG’s KRAs are important, those that directly relate to maternal and child health are KRAs 1, 4 and 5. These KRAs (Government of PNG, 2010a) are summarised as follows:

- **KRA 1** seeks to increase service delivery to rural majority and urban disadvantage by having right professionals working in the right place that can motivate and deliver right quality health service.
- **KRA 4** is about improving child survival through immunisation and rolling out the IMCI program to all PNG provinces, decrease neonatal deaths and reduce malnutrition.
- **KRA 5** seeks to increase in family planning coverage, increase capacity of health sector to provide safe and supervised births and also improving access to emergency obstetric care.

In order for nurses to provide maternal and child health services in PNG, maternal and child health content was integrated into the general nursing curriculum in the late 1960s (WHO, 2013d). Subsequent to this inclusion, postgraduate specialist training in midwifery, paediatrics and mental health was added to the Certificate and Diploma of Nursing in the early 1980s. Prior to that, PNG had no specific curriculum in maternal and child health education (Vince, 2000).
4.3 University A’s Maternal and Child Health Curriculum

From 2005 to 2009, University A offered a double major in child health and maternal health. This offering was developed in the period when PNG was seeking new approaches to reduce the rising rates of maternal and infant mortality. This program was supported by AusAID and NZAID (AusAID, 2011; Unpublished University of Goroka Curriculum for Bachelor of Clinical Maternal and Child Health, 2008). The curriculum was offered as a one-year stand-alone program, with child health offered in semester one and maternal health offered in the subsequent semester. The inclusion of VBA and VCHW training by the BCMCH students undertaking this program made this offering significantly different to that of other PNG universities. Another important component of University A’s program was that it was founded on the ‘Word of God’—a reflection of PNG’s religion, given that the country is recognised as and colloquially named a ‘Christian country’, with 95% of people having biblical-based faith (Unpublished University of Goroka Curriculum for Bachelor of Clinical Maternal and Child Health, 2008).

In 2005, the first BCMCH curriculum was offered by University A, which required successful completion of a total of 16 subjects taught over two semesters. The core subjects were able to be separated into those that were directly related to maternal and child health, and those that were more general. To provide an overview of the offerings in this curriculum, the subjects are briefly discussed below. The first subjects discussed are those that were not directly related to community/rural maternal and child health practice (Unpublished University of Goroka Curriculum for Bachelor of Clinical Maternal and Child Health, 2008).
4.3.1 **Professional issues in healthcare.** This subject prepared the students to understand that the delivery of healthcare practice is bound by legal and ethical principles, and encouraged the students to explore significant values in healthcare practice. The content provided insight to protecting and safeguarding clients and care providers by reflecting on poor performance, and encouraged development of a more inclusive environment in the overworked and understaffed PNG healthcare environment.

4.3.2 **Healthcare communication.** This course prepared students to develop communication strategies and counselling skills appropriate and specific to healthcare practice in all clinical situations. This subject considered the diverse culture of PNG, with its 820 local languages and dialects, and range of different age groups. As nurses are recognised as ‘the first to touch the newborn and the last to touch the person that exits the world through death’ (a PNG colloquialism), effective communication with the family unit is considered pivotal to the effective provision of healthcare in urban and rural settings.

4.3.3 **English for post-vocational training and academic writing.** This subject was taught by the language and literature department at University A, and developed to increase students’ understanding of written and verbal communication, and documentation and literature use in the practice areas. English is the second language for Papua New Guineans, although it constitutes the language of the formal education system from primary to tertiary level. English is seldom used for communication in everyday PNG life. Nurses use the PNG national language (Pidgin) to communicate verbally; however, English was taught in this program with the aim of increasing the students’ academic English language skills for effective communication, whether verbal or written.
4.3.4 The hospital clinical experience for child health and maternal health.
Although not considered a theoretical subject, students were scheduled to practice in each clinical area and apply the knowledge gained in their theoretical subjects to manage care related to maternal and child health in relevant clinical areas. The students’ clinical hours were part of the required competency assessment, assessing clinical skills during practice and daily attendance when completing rostered weeks. A logbook was used to monitor the students’ attendance and performed procedures for competency in this subject.

4.3.5 Health research. This subject was designed to help nurses critically analyse and use research as evidence-based practice in order to inform and improve their practice and quality of health service. The subject was also designed to introduce problem-based research in areas of practice, and for students to conduct small-scale data collection to be presented at nursing and other health conferences, nationally and internationally.

4.3.6 Neonatology. This subject prepared students to develop advanced knowledge and skills to recognise and manage neonatal abnormalities and conditions using the ‘eight-step checklist’, and provide support for mothers and families. The eight- and 10-step checklists are IMCI examination criteria first developed by UNICEF and WHO in 1992 and adapted for use in PNG since 1999, and thus using the locally updated (2004 to 2008) checklist for BCMCH training (Nicoll, 2000). These checklists were designed to assist doctors and nurses in countries that have a high infant and neonatal mortality rate in order to help detect and prevent early childhood infections and diseases that result in significant morbidity and/or mortality. The checklist remains useful in achieving its primary goals in PNG today (Nicoll, 2000)
The remaining eight subjects were identified as specifically focused on knowledge because they directly related to maternal and child health in community and rural practice (Unpublished University of Goroka Curriculum for Bachelor of Clinical Maternal and Child Health, 2008).

4.3.7 Foundations in maternal health. This subject gave students insight to the normal process of reproduction and wellness of mothers, from conception to birth. This was done by performing a comprehensive assessment and examination of women during the antenatal, labour, childbirth and postnatal periods. The subject provided information to recognise deviation from normal parameters, and indicated how to provide appropriate support and care.

4.3.8 Foundations in child health. This subject aimed to provide an understanding of why children’s health is a priority and must be treated seriously, given the increased infant and neonatal mortality in PNG. Problem-solving skills were introduced, using the previously identified UNICEF and WHO eight- and 10-step checklists. This subject also discussed the importance of recognising wellness and illness in newborns and other children, and the importance of giving appropriate and prompt care.

4.3.9 Advanced maternal health. This subject covered knowledge related to complex pregnancies, and taught students the skills to perform clinical procedures at an advanced level. Students were instructed on the safe delivery of twins, breech delivery and management of pre-term babies. Students were also instructed on performing procedures such as vacuum delivery and augmentation. Due to PNG’s shortage of healthcare professionals, nurse midwives in PNG are trained to perform specialist procedures that do not require surgical interventions. In the Western obstetric setting, these procedures would be undertaken by a medical doctor.
4.3.10 Advanced child health. This subject focused on the common diseases that contribute to the high mortality rates among infants and children in PNG, including HIV/AIDS. This subject also provided education on volunteer counselling and testing as a means of caring for HIV-positive children born to HIV-positive mothers.

4.3.11 Village maternal health experience. This subject involved students undertaking a village maternal health experience. This enabled students to enter designated villages for four weeks of placement. About 85% of the PNG population live in village settings (WHO, 2013a); thus, students were required to study village life, and assess potential and actual disease sources. This village experience was introduced to improve students’ knowledge via hands-on experience. Students conducted an ‘in-time’ situational analysis, and provided education and VBA training. The aim of this embedded VBA village education was for students to teach VBAs to identify mothers at risk, and refer them to the nearest health facility. The students also trained VBAs in terms of conducting safe, clean delivery using the “three clean” method in case of emergency; the importance of knowing transport options and having road access in specific communities; and problems associated with health facility inaccessibility.

4.3.12 Village child health experience. This component of the course also required student nurses to live in a community for another four weeks, in addition to the maternal component. The students conducted a needs assessment in the community, planned and implemented the assessed needs, and taught VCHWs about ‘too sick’ signs in babies and neonates. VCHWs were also taught to graph weights of children using use weight charts, recognise the signs of malnutrition and give advice accordingly. In addition, VCHWs were taught to read immunisation information and refer mothers to clinics for immunisations.
4.3.13 Community rural/urban midwifery issues. This course aimed to provide educational clinical skills to enable students to work in the community, train VBAs and establish clinics at the village level for mothers and their unborn/newborn babies in order to avoid possible problems in the community. Healthy homes and healthy living were also taught in order to introduce people to the concept of healthy daily life, thereby helping eradicate preventable diseases, such as typhoid. These included activities such as building proper ‘VIP’ toilets built with local bush material which had seating, pipe to remove odour with doors and built far away from the house with readily available hand washing facilities. These concepts were also incorporated into VBA and VCHW training.

4.3.14 Community rural/urban child health issues. This subject prepared students to identify the root causes of childhood diseases and to help mothers, families and community leaders take responsibility for their children’s lives. The information prepared students to reflect on who they were prior to undertaking the course, and what they needed to do to change maternal and child mortality in villages. Along with these components, in the midwifery course, students also performed a situational analysis related to child health issues, and provided healthy home education and awareness, with the aim of preventing childhood infections and diseases in the village setting.

4.3.15 Summary of the curriculum. The entire maternal and child health curriculum was conducted over a 52-week period. An additional 16 weeks was required for students to complete the competencies in their respective hospitals due to time limitations of the funding provided by AusAID and NZAID. The program was conducted for five years (2005 to 2009) with over 20 intakes per year, depending on the number of applicants meeting the university requirements. The exception was the initial training, in which there were only 12 intakes. A total of 105 students successfully
completed their studies in Bachelor in clinical maternal and child health within the given period from 2005-2009.

Although the one-year curriculum consisted of 16 subjects, for the current study, the seven subjects identified specifically focused on knowledge related to maternal and child health in community and rural practice. Associated VBA and VCHW training was purposively extracted and mapped using the Curtin University (Western Australia) mapping tool. The aim of the curriculum mapping phase (Phase 1—see Chapter 3 for more detail) was to examine the strengths and weaknesses of the designated maternal and child health curriculum subjects in providing birthing and child health knowledge and clinical skills in order to provide safe outcomes for women and children in remote rural communities.

Maternal and infant mortality remains high in PNG, with maternal mortality at 250/100,000 live births and under-five mortality at 58/1,000 live births (WHO, 2013c). To improve these outcomes, it is important to provide midwives with birthing and child health education, so that knowledge and clinical skills can be transferred to VBAs and VCHWs, and then to antenatal women in the community.

### 4.4 Curriculum Mapping

Curriculum mapping is an educationally sanctioned method of documenting whether a set curriculum meets all necessary measures of the students’ learning. It is undertaken by mapping the units of a course or the entire curriculum against pre-set criterion. Keating (2011) identified a curriculum as ‘a formal plan of study that provides the philosophical underpinning goals and guidelines of a specific education program’ (p. 1). The postgraduate BCMCH curriculum provided midwives a formal process of
study that required the successful completion of 16 subjects, with the aim of improving maternal and child outcomes in PNG rural and community settings.

The process of curriculum mapping enables identification of what was planned, absent or repeated in a curriculum in order to support the educational outcomes of the curriculum (Hale, 2008). Visual mapping allows improvements to be made if revising or developing a new curriculum, or monitoring the effect of changes made to a curriculum during its lifetime. The mapping tool developed by Curtin University was used (with permission) to undertake the mapping exercise. The ULOs or subject objectives were transferred from University A’s one-year BCMCH curriculum and mapped against the graduates’ competencies derived from the PNG Specialist Nursing Competency Standards for Child Health and Midwifery (Nursing Council of PNG, 2003 a & b).

The curriculum mapping applied the course objectives, level of learning, graduate competence, assessment and resources. When completed, it extracted the following elements of the curriculum: learning outcomes, assessment, learning experience and learning resources. This was used to identify the level to which each element was represented in the BCMCH curriculum, and allowed identification of any gaps in the curriculum that may have affected the transfer of knowledge and skills during the BCMCH implementation. The results of the mapping phase of this research identified the following attributes of the BCMCH curriculum, and the ways each were represented in the learning outcomes of the bachelor’s subjects. The mapping phase of this study informed the identification and development of the face-to-face semi-structured interview guides used in Phase 2 with the BCMCH graduates. For the purpose of clarity, the results for the maternal health component and child health component are presented and discussed separately below.
4.5 Factors Influencing Learning

4.5.1 Introduction. The word ‘learning’ has different understandings for different people in different circumstances. In an educational context, ‘learning’ is a term used to explain the cognitive (mind and thinking), affective (emotions and affect) and psychomotor (visible, demonstrable skills) changes that occur in response to environmental influences (Allender, Rector & Warner, 2010), often leading to a permanent change (Barker, 2001). The personal attributes of a person—whether past or present—also influence what that person learns. There can be positive factors that facilitate learning, such as motivation, readiness, active involvement and non-judgemental support, or negative factors, such as cultural, emotional or psychological influences (Kozier, Erb, Berman & Burke, 2000).

4.5.2 Learning outcomes. Learning outcomes are ‘statements of learning achievements’ expressed in terms of what a student or learner is expected to achieve in instructional planning and curriculum development, or a tool for measuring effectiveness and accountability in practice (Prøitz, 2010). The learning outcomes of each of the eight identified subjects of the BCMCH curriculum were populated onto a mapping structure framework (Curtin University (nd) and mapped against the level of learning and graduates’ competence to identify the emphasis placed for learning.

4.5.2.1 Emphasis on learning: The maternal health component. The emphasis on learning in the maternal health component of the curriculum identified the major component as knowledge (28%), with application closely following. In the cognitive domain of Bloom’s taxonomy, knowledge was seen as the foundation for learning (Keating, 2011). Changes in knowledge are recognised as an imperative in a curriculum, and, in an academic context, are needed as a foundation to apply in areas of practice.
Evaluation, synthesis, analysis and comprehension were also evident, with reasonable emphasis (see Figures 4.1 and 4.2).

![Maternal Health Component Emphasis of Level of Learning Across the Course](image)

*Figure 4.1. Maternal health component.*

The curriculum was designed to provide a significant level of knowledge to students in order to provide a framework to apply in practice in the clinical setting. Although the curriculum might reasonably be expected to demonstrate a higher level of comprehension and analysis than was demonstrated, the level of evidence of these elements in an ‘entry to practice’ curriculum would be considered reasonable.

### 4.5.2.2 Emphasis on learning: The child health component.

When the data on the child health component were extracted from the curriculum, there was notable emphasis on learning because this component was remarkably similar to that of the maternal health component. Once again, knowledge (27%) and application (23%) were strongly emphasised, with an acceptable spread of emphasis across the other elements of learning.
In line with the maternal health component of the curriculum, another identified emphasis was the application of what was learnt to practice. Students were expected to apply their newly acquired knowledge and skills through comprehension and understanding in order to make sense of what they had learnt (Keating, 2011). It is relevant to note that ‘understanding’ was not measured in this tool because, as a concept, is very difficult to quantify.

It is notable that the BCMCH students were already practising as registered nurses and that the knowledge received was considered reinforcement of pre-existing knowledge, with the addition of new, content-specific knowledge to apply the new skills they had learnt. A general nursing curriculum in PNG includes information and skills related to midwifery practice—for example, nurses learn to conduct manual removal of the placenta or vacuum extraction delivery (Gehardy & Garrett, 2002). In contrast, students in the one-year BCMCH curriculum were taught speciality skills in the postgraduate program. Application of the skills and knowledge in this sense accounted for a relatively high 23 to 24% of the learning emphasis, for both the
maternal and child health content areas, because of the new competencies students were required to gain in the context of the wide range of clinical and community settings (see Figures 4.1 and 4.2).

When compared with similar maternal and child health curriculums in Western countries, the hospital maternal and child health experience and rural maternal and child health experience in PNG required a significantly different and expanded skillset for these clinicians and healthcare workers (Unpublished University of Goroka Curriculum for Bachelor Maternal and Child Health, 2008). Other elements—such as analysis, evaluation, comprehension and synthesis—were also emphasised in the students’ learning experience, accounting for 9 to 16%, as indicated in Figures 4.1 and 4.2. It is notable that the percentage spread of all elements in both the maternal and child health components of the curriculum map were so similar that it could be extrapolated that both maternal and child education and skills were inseparable. Thus, both areas of learning content received equal emphasis.

4.5.3 Graduate competencies. It is well recognised that graduate nurses need to exhibit a specific set of competencies to enhance and safeguard their practice in today’s rapidly changing sociocultural, technological and economical world (Rains & Kelly, 2000). Competencies are developed to guide the practice of nursing professionals in both general and speciality areas of practice; thus, nurses must be aware of the policies concerning practice in all areas of healthcare. The Nursing and Midwifery Board of Australia (2006) identified that competencies gained during the course of study enable graduates to practice efficiently and effectively, relevant to each professional area and geographical context.

In line with the global standards, the Nursing Council of PNG developed a number of documents to guide nursing practice. The code of professional conduct was
developed in September 2002, and the Specialist Nursing Competency Standards for Child Health and Midwifery in 2003 (Nursing Council of PNG, 2003a & b). In the context of PNG, specialist nurses in midwifery and child health practice are required to be prepared to perform in the recognised resource-poor environment, guided by the standards set by the Nursing Council of PNG.

This study’s mapping exercise was able to identify the degree to which identified competencies were represented in the BCMCH curriculum. Mapping the graduates’ competencies against the eight specified subjects in the curriculum indicated the emphasis of the BCMCH graduate competencies. The main elements in the 10 Specialist Nursing Competencies Standards for Midwifery (Nursing Council of PNG, 2003a) require midwives to:

- recognise and uphold the laws relating to reproductive health, appropriate to each circumstance
- provide a duty to reproductive health and recognise unsafe practices by upholding ethical standards and the code of professional conduct
- provide women with accurate information that enables them to give informed consent and protects their rights, privacy and dignity
- acknowledge the importance and contribute to the process of reproductive health research
- communicate effectively using formal and informal channels of communication, and ensure accurate retrievable documentation to monitor reproductive health
- use information from the current National Health Plan, minimum standards, standard treatment manuals, nursing council code of ethics and code of
professional conduct, and international agencies (such as the WHO) to achieve maximum reproductive health

- demonstrate or provide leadership ability and roles in reproductive health services
- respect the cultural and spiritual values of women and promote a safe environment for a reproductive health service
- use a structured approach, such as problem solving, for assessment, analysing data, and developing a plan of care to implement
- encourage and guide women, families and the community to take responsibility for their own health
- promote the role of midwife as a member of the health team, in partnership with the community.

The main elements in the seven Specialist Nursing Competency Standards for Child Health (Nursing Council of PNG, 2003b) were also use for mapping, as child health was also a major component of the BCMCH programme, comprising 50% of the curriculum. The child health competency elements were similar to those identified for midwifery, but had special emphasis on nurse midwives’ practice in the child health or paediatric setting. The Nursing Council of PNG Specialist Child Health Competencies state that midwives should:

- recognise common and customary laws and uphold the law governing child health practice
- value and respect all people, regardless of place of origin, race, politics, status, role, gender, culture, belief system and behaviour
- use professional standards of practice to assess the performance, responsibility and accountability of oneself, and promote the role and function of a child health nurse in the profession and community
- communicate effectively using formal and informal channels
- disseminate child health education information and material to inform children, families and communities
- use information from the current PNG National Health Plan and minimum standards to plan child health services by using available resources effectively in order to achieve maximum child health outcomes
- provide a management role to deliver optimal child health services through evidence-based practice, and use professional standards of practice to assess the performance of others
- promote a safe healthcare environment, improve health outcomes through immunisation, and act as an independent practitioner
- analyse and interpret data accurately.

A nurse who met PNG graduate competencies was expected to value, promote and communicate within their scope of practice. The chart below indicates the emphasis of the graduate competencies in the BCMCH curriculum, and indicates an equitable spread of emphasis across each of the identified elements in the eight specific subjects of the BCMCH curriculum (see Figure 4.3).
All categories of healthcare professionals must emphasise respecting clients irrespective of skin colour, culture and language, and provide ethical and safe practice.

The specialist nursing competencies for PNG midwives, when mapped against the program learning outcomes of the BCMCH students, identified ‘valuing’ to have high priority in the curriculum. Given that maternal and infant mortality in PNG is very high (WHO, 2010), it is crucial to value, respect and restore the health status of mothers and children in the context of PNG’s diverse culture and language.

Safety and communication were presented at a lower level; however, these two items were identified as important in the curriculum’s offerings because tribal warfare is common among different PNG tribal groups, which can affect the health and welfare of the PNG population. The level to which each graduate competency was reflected in the curriculum was reasonably spread; however, dissemination was evidenced at 4%, which suggested poor transference of information.

Figure 4.3. Maternal health competencies.
Figure 4.4. Child health competencies.

The emphases in the child health component of the program demonstrated similar values to the maternal component for each of the graduate competencies in the BCMCH curriculum. The inter-relationship between maternal and child health means that the rationale for this is the same as that expressed above for the maternal health component.

4.5.4 Assessment. When mapping the eight subjects in the curriculum, teaching and learning methods and assessment process were aligned directly to learning outcomes. The purpose of nursing assessment is to determine whether learning has occurred, and to determine whether a learner has acquired a level of knowledge, skills and attitude to inform and support nursing practice (Ely & Scott, 2007). Assessments related to nursing in PNG are often performed in a classroom to assess knowledge and in a clinical area to assess skills.

In this study, when mapping the curriculum, different methods of assessment categories were used. Although a wide range of assessment tasks were available (see Figure 4.4), those undertaken by the BCMCH graduates placed significant emphasis on professional experience placement that occurred in the clinical and rural setting for 28
weeks. The students were required to successfully complete these 28 weeks in order to graduate.

To meet the requirements for an oral presentation, a ‘follow-up’ and ‘management’ of mother with high risk factor, for example, previous postpartum haemorrhage with potential to bleed again in current pregnancy. The follow-up and management of such cases from the antenatal stage to childbirth and to the postnatal stage were presented in class, and assessed. To meet the requirements for reflection, students kept journals of their practice, and produced a report of their daily activities, especially during their rural practice. This journal was then assessed. Assignments (written) were required to be submitted on particular medical conditions for either the mother or child. The students had to research and write these assignments, indicating understanding of the causes, risk factors and management of the selected condition (such as malaria during pregnancy). Examinations (practical) required students to perform a procedure within a given time in clinical area. For example, they may have treated a child with fever who presented at a paediatric outpatient clinic. Students were assessed on their effective and appropriate use of the 10-step checklist to identify problems without missing any steps, and outlining findings along the way. This assessment required students to provide correct documentation and advice, including ordering correct medication and laboratory tests. Simulation and laboratory practice assessments were not conducted due to a lack of resources (laboratories and mannequins) at University A. This lack of resources was identified by Kruske’s (2006) report when reviewing the facilities providing midwifery education in PNG.

Similar to any other higher learning institution, University A’s BCMCH students were required to present written work and oral presentations for the high risk case they studied. Each case study was based on applying the competencies of valuing their
practice in recognising a problem, and using problem-solving skills to identify, interpret, plan and implement care. The students had to be educated to make quick decisions, often in life-threatening emergencies while they were alone in their practice, due to the shortage of staff and resources. To support this requirement, much student learning occurred in the workplace through hands-on practice, whether with a case study or problem-solving approach, or applying skills (see Figure 4.5).

In the developed context of Australia, Bird and Wallis (2002) explored the relationship between knowledge and skills in a study related to epidural management, and found that nurses may be considered knowledgeable, but may still have a low level of clinical skills performance. Thus, when considering the BCMCH curriculum, the application of knowledge in the professional experience placement was crucial to reflect on students’ competency in recognising and managing clients with diverse health needs and problems, using whatever resources were available.

![Proportion of Assessment Tasks by Type](image)

*Figure 4.5. Students’ assessment tasks.*

Another aspect of the professional experience placement assessment was practical assessment in a rural health facility—in this case, villages in PNG.

4.5.5 **Reflective assessment in a village setting.** As a summative assessment, students were assessed in a clinical setting or classroom by teaching or clinical staff, depending on the situation. In a country such as PNG, where there is a shortage of
healthcare professionals (Dawson et al., 2011), teaching staff are the main assessors of students. This is the case whether the assessment is in an educational or clinical setting, in an urban or rural area. The exception to teaching staff undertaking assessment was during the rural component of University A’s program implementation. In contrast to teaching staff solely undertaking assessment of the BCMCH (2005 to 2009), students’ performance in the community or village was assessed by VBAs/VCHWs and teaching staff. In the village setting, not all VBA/VCHW participants involved in the training were literate, and formal assessment was not possible.

In the case of the village experience, the assessment was undertaken by others, such as VBAs and VCHWs, to identify the students’ clinical community performance and how this assisted in the transfer of knowledge to VBAs and VCHWs. The VBA or VCHW performed a return-demonstration of a procedure taught by the student, followed by a verbal explanation of the purpose of that procedure. An example is preparing a birthing unit using the ‘three cleans’ method (clean environment, clean hands and clean equipment) (Blencowe, Lawn & Graham, 2010). In this case, if the VBA is called to deliver a baby in a village during an emergency, implementing the ‘three cleans’ is an important part of the childbirth. During the community placement the student would demonstrate and undertake examination and delivery of a baby in the village using the ‘three cleans’, and then supervise and assess the VBA undertaking the same skills and demonstrating use of the ‘three cleans’. The ‘three cleans’ are a pivotal learning framework for VBAs because puerperal sepsis and haemorrhage are a major killer of PNG women during childbirth, if not managed properly (Department of Health, 2000).

4.5.6 Learning experience. The BCMCH program curriculum was designed for students to have a 40% theoretical and 60% clinical learning component (Unpublished
University of Goroka Curriculum for Bachelor Maternal and Child Health, 2008). This is reflected in Figure 4.6, which indicates that approximately 60% of learning was undertaken away from the university classroom setting, including clinical practice, individual learning and other activities (such as library study). While it may be argued that workshops, seminars and individual study do not constitute clinical learning, it more readily reflected the real experience these students were likely to encounter in the rural village setting, where they would need to be self-directed, evidence-based and linked with professional bodies to update their knowledge and skills. For this reason, these elements were considered to be outside the face-to-face theoretical program and linked to the clinical program.

![Proportion of Learning Experiences by Type](image)

**Figure 4.6.** Method of learning.

During the 16 weeks allocated for clinical practice in the BCMCH program, the students worked for the full day (an eight-hour shift), and often stayed longer to complete their clinical procedures. While undertaking the required clinical procedures, students were able to develop and demonstrate competence in the necessary skills.
Individual study hours required the students to undertake case follow-ups and spend time individually researching information for assignments and literature reviews to support their case studies in the hospital clinical setting or medical research library at the hospital.

**4.5.7 Learning resources.** The university educators commonly used key stakeholders to support their teaching, such as private practising doctors or language lecturers from the university. At University A, nursing students wore a uniform throughout both the theory and clinical phases of their study. Recommended textbooks were commonly used to enhance learning both in theory and clinical practice, including PNG standard manuals developed by health consultants in collaboration with the WHO guidelines, and edited every five years. The availability of these resources was limited and numbers were insufficient and learning occurred often by face to face in a form of lectures as staff had some most up to date text books for reference. Most resources published overseas were expensive to purchase, and the university largely purchased these through donations from aid organisations or donor partners which the students could borrow for limited time.

Web-based learning was unavailable because of a lack of computers or internet penetration and connectivity. Multimedia programs, such as CDs and DVDs, were available, but had to be booked through the university. Resources such as computers, overhead projectors, mannequins and laboratories for demonstrations were scarce; thus, hardcopy materials, such as textbooks, were mainly used. These resources were sufficient in both number and availability, especially the common midwifery and child health textbooks. Students had difficulty accessing and sourcing basic equipment, such as thermometers, sphygmomanometers and stethoscopes, as well as the basic
consumables for providing care in the clinical setting sometimes affecting care given to patients.

4.6 Conclusion

In this phase of the study, the BCMCH curriculum was mapped using the Curtin University curriculum mapping tool. This allowed identification of learning in terms of the learning outcomes, assessment, experiences and resources. The emphasis placed on knowledge and the application of skills was found to be dominant in the program learning outcomes. In terms of the influence of learning experiences, the university placed greater emphasis on professional experience placement. The set rural community practice was a new approach in University A’s BCMCH curriculum, as was the VBA and VCHW training, including rural reflective assessment. The mapping identified that the main factors influencing students in the BCMCH curriculum were the level of learning, professional experience placement, assessment, learning experience and resources.

In order to inform Phase 2, semi-structured interview questions for University A’s BCMCH graduates were developed in relation to these factors. The results of this will be expanded with consideration of the study research questions in the forthcoming Chapter 5.
Chapter 5: Maternal and Child Health Knowledge and Skills Acquisition

5.1 Introduction

Phase 2 of this retrospective study examined the strengths and weaknesses of the educational knowledge and clinical skills transferred to the BCMCH graduates from University A from 2005 to 2009. First, this chapter describes the method and nature of sampling for this phase. Second, it presents the emerging themes, with selected excerpts from the participants involved in the study. Finally, this chapter concludes by presenting the main strengths and weaknesses identified and experienced during the maternal and child health knowledge and skills acquisition and transfer.

5.2 Sampling

The BCMCH curriculum mapping in Phase 1 (see Chapter 4) enabled development of the semi-structured interview questions that guided the interviews with the BCMCH graduates in Phase 2 of the study. The questions were specifically developed to elicit participants’ perceptions of the relevance and appropriateness of the nature and scope of their learning experiences, with specific reference to the following: educational learning, professional experience placement in hospital, professional experience placement in the community, the assessment method, and educational and clinical resources.

The target population in Phase 2 included the total sample of 105 nurses who had successfully completed the BCMCH one-year curriculum at University A in PNG during 2005 to 2009. The invited participants undertook their education at University A with the specific and unique BCMCH and associated modules on VBA and VCHW training and rural clinical placement (see Chapter 4). A semi-structured interview guide,
developed from both the literature and curriculum mapping data, was developed and then piloted (Chapter 3) to guide the face-to-face interviews. The interviews were conducted between January and March 2013. Twenty graduates were purposively recruited to participate in the study. However, due to attrition, only 16 successfully completed the interview. Two participants indicated they were too busy, one did not attend the scheduled interview and another did not want to take part because of a lack of confidence with English. Of note here is that, despite the primary language of PNG being Pidgin (a colloquial dialect), the interviews were conducted in English, as it is the language of instruction in PNG educational settings. The data presented in this chapter encompass the findings from the 16 Phase 2 study participants.

5.3 Demographic Data

The participants held a range of senior nursing roles, including nurse managers, team leaders, nurse educators and specialist nursing officers. There were three male and 13 female BCMCH graduates, with ages ranging between 32 and 51 years. Changing from a certificate to diploma level program meant that the entrance requirements for the BCMCH curriculum included being a registered nurse with either a certificate or diploma in nursing, and being employed for more than five years in a midwifery or child health environment. Thus, the participants’ pre-qualification education level was either Grade 10 or 12 in secondary school. In this study, there were 12 participants with Grade 10 and four participants with Grade 12 qualification.

5.4 Emerging Themes

Eleven main themes emerged from the thematic analysis, as follows:

1. the sufficiency and appropriateness (relevance) of maternal and child health knowledge acquisition
2. maternal and child health skill acquisition and implementation
3. learning enhancement strategies for knowledge acquisition in resource-poor settings
4. VBA and VCHW knowledge and skills transfer in rural communities
5. knowledge and skills application/transfer to promote the community healthy Island concept
6. transformational practice through community experience—‘back to the roots’
7. community collaboration and partnership to implement the MDGs
8. professionalism/career prospects
9. preferred clinical assessment to evaluate knowledge in low-resource settings
10. suggestions to improve clinical/community practice
11. recommendations for future programs.

The following section of this chapter describes these emerging themes and associated subthemes in terms of the primary research aims. Of particular emphasis is the nature and extent of the BCMCH curriculum knowledge and skills transfer to VBAs, VCHWs and the community. To align with the ethical requirements to de-identify the participants, pseudonyms are used in the reported testimonies.

5.4.1 Sufficiency and appropriateness of maternal and child health knowledge acquisition. The participants discussed their perceptions of the strengths and weaknesses of specific subjects in the BCMCH curriculum that prepared them for the role of a maternal and child health nurse. Of note here is that, in PNG, the majority of government- and church-sponsored graduates of the BCMCH were expected to return to practice in the setting in which they were employed prior to undertaking their study (hospital, health centre, urban or rural clinic, or educational facility) (see PNG Health
structure—Appendix one). Only a few graduates were able to undertake employment in a new placement from their previous employment.

The participants identified that, apart from the knowledge acquired to practice in a healthcare facility—whether a hospital or rural health centre—the most significant knowledge gained from the BCMCH curriculum was the community practice component. This was in conjunction with value placed on local knowledge of what to expect in remote rural and tribal areas—such as geographical locations, the specific customs and culture of birthing practice, food sources and preparation, general hygiene and waste disposal. One participant, Jaminan, described how the curriculum contributed to broadening his knowledge and enhancing current areas of practice: ‘the rural community practice was a new concept [that] broaden[ed] community knowledge. I am ... recognising community problems and having better understanding of community lifestyle to give better care’. This notion of how the curriculum affected perceptions was echoed by Glengs:

*I saw the value of training ... it really help[ed] me to see the first sign of help to women in the village or community level, where there is no medical assistance or delivery room or medical equipment available to help this mother and child ... just see warning signs and help them to come to hospital.*

In PNG, community health facilities are located both in provincial and district levels in each province. To support provincial health facilities, aid posts were developed in 1940 and located at community level to service the community. However, in 2008, of the total of 2,672 (77%) aid posts that were opened throughout the country, around 776 were closed in various provinces in PNG. For example, in the Eastern Highlands province (see the map of PNG in Chapter 1), from the total of 180 aid posts, an estimated 51% were closed in 2008 (Government of PNG, 2010b). This centralisation
of resources to the provincial and district level has resulted in nurses working in hospitals and health centres, thereby having less immersion in villages and less knowledge of village lifestyles and diseases (Jayasuriya et al., 2012).

Lapiwan furthered this theme when asked about the strengths and weaknesses of the knowledge received from the BCMCH curriculum:

_I am equipped with knowledge and skills to work in both urban and rural setting. [I am] able to manage complicated procedures such as twins, triplets, breech and prolapsed cord to practice in the organisation I am working with._

In contrast, Salina identified one of the deficits associated with her learning, related to the expertise of the educator offering the program: _’I acquired less skills and knowledge due to [there being] no specialist tutor at time of training and [because I was] a pioneer of the program’. _Jena identified that she had: _’acquired knowledge [but was] unable to implement [it because I was] working in different setting to that trained for’._

The acquisition of formal curriculum knowledge was seen by participants as giving them the ability to undertake specialised practice, and develop respect both for themselves and from their communities. The attainment of such knowledge in the context of PNG created a popular colloquial experience of ‘happiness in life’ (due to being educated, employed and self-sufficient)—whether informal knowledge gained from life or formal knowledge gained in an educational facility, such as a university or nursing college. These BCMCH graduates stressed the importance of knowledge acquisition, while also testifying to the importance of sufficiency and appropriateness of the curriculum for their community clinical practice. Of importance was that VBA and VCHW educational knowledge transfer was seen to affect maternal and child health.

Given the importance of a locally-based curriculum that needs to respond to a given country—in this case, a low-resource country—social determinants need to be
embedded in the cultural context. Questions arise regarding how a largely Western-based biomedical knowledge curriculum can transfer knowledge and clinical skills through a chain of stakeholders in a complex and multidimensional cultural context. Each specific context has its own unique culture of learning; hence, the BCMCH graduates testified that, in general, they had acquired a considerable improved level of knowledge and skill for rural and remote community work. This notion was supported by Simone (1999), who stated that the nature and appropriateness of knowledge transfer is related to how a learner adapts to the cognitive, motivational and emotional processes of learning in a socio-ecological context.

The participants gave mixed responses regarding the sufficiency and appropriateness of the specified subjects in the BCMCH curriculum that informed their knowledge and skills acquisition. The 2005 to 2006 graduates from the BCMCH testified to encountering difficulty with learning resources, while the 2007 to 2009 graduates reported satisfaction with the knowledge and skills they had acquired. This finding emphasises the importance of having adequate teaching resources, as well as clinically and academically educated staff engaged before conducting or introducing any new programs in the future.

5.4.2 Maternal and child health skill acquisition and implementation. The participants described the strengths and weaknesses of their clinical practice prior to undertaking the BCMCH curriculum. They generally identified that the knowledge and skills learnt during the BCMCH curriculum had empowered them to implement what they had learnt in practice. For example, Maline, from the highlands, stated that,

*I can now do vacuum extraction, manage retained placenta by doing manual removal, I can do complex deliveries, like breech ... I am competent ... in the past I couldn’t do it without the doctor’s supervision. And another new skill [I]*
learnt is to manage mothers who are HIV-positive in labour using standard protocol in HIV during labour and childbirth.

Kumin also claimed that her performance had improved through:

*Care of women from antenatal to home visiting through application of case study skills, [which] gave more confidence in public speaking, improved health education and awareness at workplace, understanding triaging skills and management of childhood illness promptly.*

Glengs, from the coastal area, identified that the skills and knowledge acquired:


Specifically in regard to academic writing, Jenna added: ‘I did not know how to speak and write good English, but, after the course, I have improved in English and writing’. Lapiwan testified that she had acquired skills by caring for women during labour and childbirth, including: ‘*Recognising complications and management of distress baby, and conduct resuscitation, successfully deliver triplets, breech, and competently identify mal-presentations and twins*’. In addition, Salina stated that she: ‘*Can perform specialist midwifery procedures, like management of women with postpartum haemorrhage, can conduct vacuum extractions [and] manual removal of placenta*’.

However, several participants noted specific limitations in practising their acquired skills. For example, Rosita stated that:

*BCMCH program multi-skill [possess both midwifery and child health skills relevant] for rural setting, [graduates unable to] implementation jobs [due to]*
limitations experienced as working in other settings, example TB [tuberculosis] clinics and not able to implement [for example] management of ‘too sick’ child or work in maternity ward, so less input of skills.

Meanwhile, Lapiwan mentioned that some of what she had learnt could not be implemented due to PNG’s religious practices. For example, family planning education and methods could not be implemented in places of employment such as Catholic health services, where use of family planning method was limited due to religious beliefs.

The participants reported that they were able to use maternal and child health knowledge and skills in various hospital settings, such as the obstetrics and gynaecology unit, paediatric unit, special care nursery, rural health facilities, community health setting and educational institution (as tutors and lecturers). The BCMCH graduates interviewed noted that their ability to either implement or not implement the knowledge gained in the BCMCH curriculum was directly related to their later work environment. As exemplified in a comment from Ruthy:

being a BCMCH nurse, in the field, I have learnt many things which I would like to do or perform, but the place I am working is [the] gynaecology ward. I want to go and work in [the] labour ward ... into the villages and identify antenatal mothers and sick babies.

Current staff shortages, especially in nursing, have been experienced in PNG government health facilities due to many nurses working in private and church health sectors. For those nurses who remain in the government sector are commonly aged and placed in clinical areas where vacancies exist, thereby limiting government sector nurses’ potential to acquire and implement new knowledge and skills. Since 2002 in PNG, many graduate nurses have been unable to practice due to registration and licensing issues associated with the Nursing Council of PNG (as outlined in Chapter 2).
University A’s graduate midwives and paediatric nurses could not practice as midwives or paediatric nurses in clinical settings. It was not until 2013 that registration and licensing was sanctioned (University of Technology Sydney, 2015). This enabled the nurses and midwives who had graduated since 2003 to be registered and given the licence to practice, which helped reduce the nursing and midwifery shortage in PNG. Nurses from the maternal and child health double degree were further asked to register as midwives or paediatric nurses to practice in their desired clinical setting.

5.4.3 Learning enhancement strategies for knowledge acquisition in resource-poor settings. People learn in many different ways and acquire knowledge and skills depending on the context of the education and educational setting. The interviewed graduates reported that some specific teaching and learning strategies had enhanced their knowledge acquisition for practice, but also noted the unavailability and inadequacy of specific resources to support learning. Learning as part of a group featured as an emerging theme from the student participants. For example, Bukinan suggested that group work and group discussion were his preferred mode of learning: ‘I like group work as method of learning. We participated together, share knowledge and I learn from others’. This perception was supported by Kumin, who noted that: ‘Individual is unique—I enjoy doing group work or study as I can learn from other. [I] lack self-initiative and motivation [in] individual learning’. In addition, Jena reflected on how presenting to the group improved her skills: ‘Individual case presentation was [a] new skill which improved public speaking … presentation helped me stand in front in public and talk, which I never did … before’.

Not all student participants perceived that they benefited from group work. For example, Glens reflected on some of the deficits related to group work:
she learnt through reading and researching, but for group work some students] depended on others and some have their differences. Individual learning was helpful to myself when [I was doing an] individual presentation, my lecturer assessed me [and] I can see my weaknesses and correct them.

Further supporting this was Maline who added that:

I was able to do research and write assignment or case study, but, with group work, we learned from each other’s contribution, but in clinical [practice], we need [a] clinical tutor to assist us with clinical skills.

The support from academic staff that was available for students was recognized as a strength of University A’s BCMCH. However, the limited availability of academic staff was also noted as a weakness. Menjo stated that there was: ‘Closeness and availability of teaching staff to guide us ... they were there all the time for us ... [While] there were not enough staff, [the] doors were open for us’. Jena added that: ‘there was only one lecturer and she couldn’t afford to be in classroom and clinical areas to supervise’.

A lack of university resources to support learning was also identified as a weakness. Maline mentioned that:

I go through the lecture notes ... try understand and use it to put into practice ... [but] there were no textbooks or computer we could use in our learning, no[t] enough lecturers to teach us and clinical tutors to assess us properly.

5.4.4 VBA and VCHW knowledge and skills transfer in rural communities.

In 2005, the new BCMCH program was offered in three universities in PNG; however, a unique aspect of the program offered from University A was the curriculum focus on community maternal and child health practice, as outlined in Chapter 2. The distinctive curriculum focus was on training VBAs and VCHWs. In order to master the VBA
subjects and related knowledge, the graduates were required to live in a rural village for eight weeks (previously, students had stayed in the rural healthcare facility) and directly train VBAs and VCHWs while there. The participants reflected on the education knowledge and skills transferred to VBAs and VCHWs during their community practice. Their discussion of the effectiveness of the training highlighted a number of concerns. Upon reflecting on the importance of VBA training in reducing the puerperal sepsis deaths that are common in the highlands of PNG, Salina stated: ‘Village birth attendants do not have good skills to attend labouring mother. In case of no transport [or] flooding river, I taught them to do aseptic delivery to minimise risk of infection’.

Ruthy was observed to be very passionate about rural community VBA and VCHW training, and gave a detailed account of what she taught her targeted VBA:

I’ve trained VBA on how to identify high-risk mothers, especially those with big abdomen, mothers who are sick in pregnancy with malaria, pneumonia and anaemia—bring them to hospital. I also showed them how to palpate pregnant mothers.

In addition, Terrie explained that, during VBA training:

I showed the VBA how to check the mother from head to foot; find women at risk and refer; [do] preparation for emergency village deliver; recognise[e] normal from abnormal through palpation, and refer. [I] gave antenatal education on preparation for childbirth, nutrition, hygiene, high-risk factors and management.

In PNG, there is a common colloquial saying of ‘shooting two birds with one stone’, and this was the approach taken when training one village volunteer with two skillsets. The VBAs were also trained in child health skills to enable them to develop a dual skillset to deal with a variety of health situations. The VBA and VCHW were
trained by the same student nurse in the community. To undertake this training, the commonly spoken Pidgin languages were used. When asked what knowledge and skills on child health were passed onto the VBAs to qualify them to practice as VCHWs, Glengs stated:

In VCHW training, [she taught VCHW to] recognise ‘too sick’ signs, such as observing fast breathing or ‘pulim win klostu, klostu’ in a case of pneumonia or ‘skin hot’ for fever [malaria], ‘ai wit’ or pallor [anaemia] and refer. Hidden illness picked up and can differentiate between ‘sick’ and ‘very sick’, and make referral.

In addition to the prescribed curriculum knowledge on pneumonia, malaria and anaemia, Linapo and Ruthy added that VCHWs were taught to: ‘Weigh baby, plotting and graph reading’ and were taught ‘immunisation reading and referral for immunisation’, ‘nutrition and nutritional food preparation’ and ‘family planning’. Halena explained that they taught preventive measures for disease prevention and healthy living, using locally available resources: ‘if child comes with flu or a runny nose, we tell them to give lemon juice or steam bath with Vicks and warm water’.

Regarding areas of knowledge that had not been taught in the formal BCMCH curriculum, Helena identified that they were not taught: ‘Budgeting for hospital fees and general personal hygiene during menstruation and childbirth’. Other general comments on VBA training by the participants included that the ‘training was unique’ and that the VBAs and VCHWs were: ‘[the] eyes, ears, legs and hands for health workers in geographical location that are not conveniently located’ (Ruthy); ‘train[ed] ... to be little nurses’ (Menjo); and ‘[the] first contact for “too sick” and high-risk [clients]’ (Salina).

VBA training in PNG was introduced systematically in the 1980s by UNICEF, with the aim of promoting maternal and child health safety during pregnancy and
childbirth. Since then, many other government organisations and NGOs began training VBAs and VCHWs/volunteers (Karel, 1994). Despite this early adoption, there is no evidence that similar educational training to that provided by University A’s BCMCH has been undertaken elsewhere in PNG, with university students living at the community level and training both VBAs and VCHWs. However, this ‘domino’ style of knowledge transfer is arguably an effective way to positively affect the maternal and infant mortality rates in PNG, which are the highest in the Western Pacific (WHO, 2011). Unique to the BCMCH curriculum was the focus on maternal and child health issues, and the priority given specifically to public health (such as building proper toilets for waste disposal, putting windows in houses for fresh air, building dish racks to store utensils, and keeping the environment clean to promote healthy living as a way to eliminate preventable disease.

5.4.5 Knowledge and skills application/transfer to promote community ‘healthy island’ concept and outcome.

The concept of ‘healthy settings’ for low-resource regions was initiated by WHO in 1986 to promote healthy cities, towns, islands, schools, universities, markets and villages by WHO’s member nations in their regional sites (Harpham, Burton & Blue, 2001). As a member state of the Western Pacific, PNG introduced the ‘healthy island’ concept in 2000 (Puka & Chen, 2000). University A incorporated and taught the healthy island concept in the BCMCH curriculum, with a focus on community rural and urban issues in the child health and midwifery subjects. In these subjects, students were able to conduct situational analyses and teach VBAs, VCHWs and associates in communities about healthy living and healthy homes, with the aim of promoting healthy families and preventing disease.
When the graduates commented on providing information on healthy homes and disease prevention, they referred to undertaking a ‘situational analysis and community need implementation’ in the community as part of their curriculum-based VBA and VCHW training. This aspect of community practice was perceived by the participants to provide a sound basis for understanding community lifestyle, and enabled the students to apply their maternal and child health knowledge and skills. Halena said: ‘I recognised the community training/placement as vital [where] real needs [are] identified [in the] community [whereas] not identified in health centre [and] input made difference’. In support of community practice, Salina commented that: ‘Community practice brought awareness of factual information,[the] water source was open stream[and] risky water source, and [un]-healthy environment identified [and] cause of disease and provide[d] health education on fact to boil drinking water[and] fence animals’.

The participants also discussed the use of toilets in rural communities. They discussed their observations and different initiatives to ensure healthy homes and eliminate disease. Jena said: ‘many [were] not using toilets, so [I] showed them [how] to dig toilet’. Ruthy stated: ‘I showed them to boil drinking water and wash hand[s] to prevent typhoid and gastro’. Naik Mendo stated: ‘I built rubbish pit [and] dish rack, [and gave] advice to have window in house for good ventilation. Community attitude changes [they]fenced water hole, boiled drinking water[and] building toilet 20 metres away[from the village]’. Menjo stated: ‘I taught them to prepare hand washing equipment, [have] no animal in the same house, build shower room outside, and have good toilets and drinking water’.

For Lapiwan and Sakul, community practice was considered an important opportunity to provide evidenced-based practice, particularly because community members considered childbirth deaths as related to supernatural forces. For example,
Sakul explained: ‘Sorcery were [sic] blamed for deaths’. He stated that: ‘we identified there were no toilets [so] we build toilet, rubbish disposal pits, cut tall grass and plant[ed] flower[s] around the house’. Lapiwan stated that: ‘because of community knowledge limitation, [people] blame sorcery for pre-eclampsia toxaemia, or any complication in antenatal and labour’.

Health education was provided including information on healthy home skills and preventive measures and promoting a clean environment, using proper toilets, upholding general hygiene, disposing of rubbish, employing hand washing equipment, using a dish rack, avoiding having animals in houses, and boiling water to ensure safety. The participants felt that living in the villages enabled them to encounter different experiences and deliver knowledge-based health education. For example, Ruthy explained that:

\[ \text{men were educated on their supportive role in maternal and child healthcare [and] safe motherhood to make them feel part of the team in ‘men as head [head man] mentality’ in decision making to stop [and] men and women to work together.} \]

In support, Linapo further added that they were: ‘educating [men] to value women in the society [in the] “hetman” (paternalistic) culture’.

The graduates also provided education on HIV/AIDS, STIs and family planning. While in the community, Ruthy and Menjo witnessed the effect of HIV/AIDS and STI education on the general population. Ruthy stated: ‘I witnessed people volunteering in numbers for testing, eager to know HIV status. [We] broke barriers to HIV/AIDS testing’. In cases where women tested positive for HIV and needed to breastfeed, to clear misconceptions about breastfeeding, Naik Menjo explained that the main
preventive messages given to women were about: ‘Exclusive breastfeeding, malnutrition, early weaning in early pregnancy’.

PNG in the last 3 decades (1987-2015) had experienced HIV/AIDS epidemic, in which it is estimated that 1.8% of people aged 16 to 45 are infected with HIV/AIDS as a result of the underlying social determinants of poverty, health illiteracy and transactional sex (Worth et al., 2012). In 2010, of the 138,581 people tested for HIV, 4,280 were positive cases requiring treatment. This is predicted to increase to 12,000 in 2013 the latest available figure to date. Thus, the management of HIV still poses a challenge for PNG (Valley et al., 2013; Worth et al., 2012). Due to better treatment and education, mother-to-child transmission of HIV has been moderately reduced. However, to date, considerable stigma and discrimination are associated with HIV-infected pregnant women and children, which has led to ‘unwanted risk of violence, abandonment’ in extended family systems, which poses a threat to ongoing voluntary testing (Carmone et al., 2014). Once the BCMCH students worked in different communities, their observations of village life helped dispel the rural and remote villagers popular myths about transmission and stigma regarding HIV. From these experiences, the students were able to educate remote villages about infection transmission and prevention, with the community gaining trust to undertake voluntary HIV counselling and testing. Regarding the effect of that education, University A’s students observed that the VBAs counselled and referred clients to local volunteer testing centres in places such as University A.

Other vital information and education on the importance of family planning was also given to the VBAs and VCHWs during the community experience. In reflecting on the type of information given to VBAs and VCHWs, Naiko stated:
I gave family planning advice ... importance of family planning ... when child is born and up to three years, they can have another baby ... I have to make them aware of the importance of family planning so that they don’t have children one after the other.

Situational analysis and community need implementation strategies used in the community enabled the graduates to identify needs and educate the community to dispel myths regarding health to enable better living. In situational analysis, the students and allocated VBAs and VCHWs inspected the general environment of the community to assess living conditions, water sources and toilet disposal facilities. They also gathered information on family size, deaths, births and types of diseases encountered by the community. They then developed and implemented health education and preventive strategies in the community, based on the gained evidence.

5.4.6 Transformational practice through community experience—‘back to the roots’.

The participants generally appreciated the community practice experience and the changes that occurred for them both personally and professionally during this experience. Many participants had grown up in towns and cities, while some had a village-based childhood. They commented on the differences between rural community practice and rural health centre practice, with students from different backgrounds offering different expressions of their experience.

Ruthy testified to: ‘experiencing village life at “first hand” and experienc[ing] situation and struggle, sleeping without electricity, drinking from same water source, residing in the community and involving in community affairs, such as marketing vegetables for income’. Linapo’s ‘first-hand’ experience involved ‘no transport, walk[ing] distance to main road and getting [a] better understanding of geographical
location’. Salina’s community experience brought a ‘Change of attitude to value women and children differently [show] empathy and sympathetic [from] significant knowledge community awareness and understanding [received] and valu[e] women and children’.

Maline referred to ‘gaining trust from community for HIV counselling and voluntary testing’, while Naik Mendo: ‘Change[d] my behaviour and approach to give care differently, create positive relationship, respecting others more and be gentle and approachable’. Lapiwan stated that she:

Change[d] practice behaviour for high-quality work output, quality care to women—don’t see lunch hour as lunch hour, or afternoon as time to finish work.

Change my way and ability to serve better, regardless of time.

Ruthy stated that: ‘I thought I was the boss [but then] realise[d] they [village people] were the boss’. This was further supported by Lapiwan, who stated that she sought to:

Promote awareness and instil promptness for availability, recognising [the] distance people travel and mode of travel, [and gained a] better understanding of community lifestyle, [and] recognises role of VBA/VCHW as key players [taking the leading role] in reducing maternal and infant mortality [and they] become our hands, feet and eyes, [I am] supportive for their training.

As for Jaminan, the community practice involved seeking to: ‘reduce health centre care and treatment. VBA/VCHW were first point of contact to implement self-help projects [such as the building] of roads and [providing] health education to communities’ where they were based.

The interviewed BCMCH graduates stated that, during their rural community placements, they experienced the life and hardships encountered by women in remote rural communities, and testified to this having a positive effect on their attitudes, behaviour and clinical practice.
The PNG news media often depicts examples of negative nurses’ attitudes and behaviours in local newspapers and other reports. While nurses are blamed for their poor performance in PNG news and social media, the reality and context of resource impoverishment and high nurse workloads is seldom cited. In 2014 in Port Moresby, speaking at World Nurses Day, the UNFPA country representative stated that PNG nurses are ‘unsung heroes’ (The National, 2014). In 2008, a report on maternal health in PNG submitted to the PNG ministerial taskforce reported women patients’ testimonies to the use of offensive and demeaning language by health personnel in hospitals (Government of PNG, 2009). PNG women seeking hospital care expressed fear about approaching health workers, saying they ‘asked so many questions and very rude/not friendly’ (Vallely et al., 2013, p. 3). A survey of nurses’ attitudes and behaviours found that, while nurses may have positive attitudes, their practice may still be ‘haphazard and erratic’ (Moore & Price, 2004, p. 948).

5.4.7 Community collaboration and partnership for implementing MDGs.

The PNG National Health Plan 2011 to 2020 has the aim of strengthening primary healthcare services, and prioritises ‘return to the basics’ as central to improving service delivery to rural mothers and the general population. The current study participants acknowledged the importance of working in partnership with the community to meet the WHO’s MDGs by educating VBAs and VCHWs. The participants testified to anticipating specific educational needs such as family planning, sexual transmission infections such as HIV and villages unassisted deliveries leading to maternal and infant mortality and therefore recognises the importance of training VBAs and VCHWs/volunteers in the community. Salina stated that:
PNG is not like other areas where they have access to good transport, road and health facility ... we are struggling. Disease rate is not going down ... maternal death is not decreasing ... village birth attendant and village child volunteers must be trained ... they are in the village [during] night or rain or tribal war. I cannot go to the village and provide the care ... the assistant will be doing this in their own community.

Ningiam stated that her reasons for training VBAs and VCHWs were to: ‘Promote awareness and promptness for life saving [through] referral of high-risk women and “too sick” bab[ies], [and] family planning spacing to prevent obstetric complication’. Menjo stated that: ‘I wanted no mother to die; I wanted no baby to die. [The] causes are preventable [by] up-skilling them [VBAs and VCHWs] with skills to guide our mother and refer them’. In addition Rosita identified ‘impartation of skills and knowledge as means of reducing infant mortality rate’. Maline’s reason for training VBAs and VCHWs training was to enable: ‘Community collaboration—we work in partnership to reduce maternal mortality rate and infant mortality rate [by] understanding and implementing Millennium Development Goal’. The participants noted the importance of working in partnership with the community to meet MDG 4 (reducing mortality for children under five years of age by 2015) and MDG 5 (reducing maternal mortality by three-quarters by 2015) (WHO, 2011).

In PNG, the majority of the population lives in tribal and rurally located community groups, with only 15% living in urban settings (UNICEF, 2009). Many central public health priorities (such as HIV/AIDS and maternal and infant mortality) have had a profound effect on rural communities—a situation further compounded by the paucity of health information and high levels of health illiteracy.
5.4.8 Professionalism/career prospects.

The interviewed participants commonly stated that their BCMCH education had enhanced their career prospects and opportunities for promotion through their managers recognising their increased capacity for responsibility while at the same time nurses noted certain limitations in their practice. For example, Menjo stated that:

*In my current practice, I am unable to do VBA training or work in paediatric or maternity ward ... I am doing administrative job, being more like a driver for maternal health ... driving the ideas of the organisation [and] bringing service to the people in the community.*

Naik Mendo commented that: ‘*I am promoted as a district nursing officer [yet am] mostly doing administrative duties ... and advocating and promoting maternal and child health at times*. ‘Linapo (promoted to unit manager) stated: ‘*I learnt about being a preceptor ... I precept community health workers, my co-workers and diploma in nursing students so we can competently give patient care*.’ Bukinan identified that:

*I am teaching and, at the same time, the knowledge I gained from [BCMCH] is advanced, and what I am teaching and taking them through ... I see what I have been doing previously was little, but now I can do more.*

In response to the professional development component of University A’s BCMCH, the following comments were made by participants. Glens stated that:

*‘before the training, I was working as general ward or labour ward. Now, currently, after the training, [I] specialise in maternal and child health HIV and cervical screening’. ‘Salina stated that she:*

*studied as a pioneer [with] no midwifery tutor to take us [students] ... my skills was [sic] insufficient, but [I] was fortunate to attend [an] emergency obstetrics course that helped me to perform midwifery procedures confidently [as a*
specialist midwife]. I am now able and assist our students, my colleagues, resident health extension officer and [resident] doctors.

However, several participants noted limitations to their practice. Sakul highlighted ‘Misplace[d] human resource and partial implementation of care’; Linapo indicated ‘semi-skilled trained staff working in areas not trained for; unnecessary admissions experienced from labour ward to nursery’; and Ruthy stated ‘I cannot continue training due to work location or job promotion and description’.

Several senior nurse managers not involved in the current study anecdotally noted their satisfaction with BCMCH graduates from University A, in relation to their performance and ability to undertake management positions in hospitals and NGOs.

5.4.9 Suggestions for clinical and community practice improvement.

Some participants stated certain limitations to University A’s BCMCH clinical and educational knowledge and practice, focusing on the transfer of educational knowledge and skills. The subthemes in this section included skill deficits, some important topics not included or discussed in sufficient detail, and some courses that could not be implemented.

Sakul acknowledged that some of the topics in the set courses were helpful, but found specific skill deficiencies, with ‘little or no learning equipment and resources in place [and] limited time for hands-on practice on skills, such as lumber puncture [and] neonatal resuscitation’. Maline, who was involved in management responsibilities, stated: ‘[I] did not learn much about management/administrative skills and budgeting. [I] required more time for academic writing, research proposal writing, and emergency obstetric management’. Rosita felt she had acquired clinical skills, but was unable to implement certain skills, such as ‘volunteer counselling and testing of HIV [and] prevention of mother-to-child transmission and preceptorship’.
BCMCH graduates who had gained employment in obstetrics and gynaecology units emphasised certain competencies that needed improvement. For example, Salina indicated ‘management of pre-eclampsia toxemia management [and] postpartum haemorrhage’; Linapo discussed ‘neonatal resuscitation and management’; and Ruthy wanted education to ‘expand more on the palliative care for all forms of cancer in women’. These testimonies indicated specific aspects of clinical, community and theoretical knowledge that were seen to either be deficient or have discrepancies. However, the majority of participants found the knowledge and skills acquired to be sufficient and appropriate. It may be that these discrepancies would only emerge when an outcome or impact evaluation was undertaken on a program, policy, product or service at mega (institution), macro (discipline) and micro (student learning) levels, such as in the current study.

5.4.10 Preferred clinical assessment to evaluate knowledge retention in low-resource settings.

In educational settings, assessments are conducted to evaluate the learning among students, as per the outline provided in Chapter 4 and the literature review. Section 4.5.4, has mapped and evaluated the BCMCH curriculum means of assessment. Many different methods of assessments have been documented; however, those that were preferred by University A’s graduates in the resource-poor setting were those that enabled knowledge retention and enhanced clinical skills acquisition and improvement. For example, Glengs preferred to learn through clearly defined locally-based case studies, undertaking home visits and client follow-up as a means of assessment. She claimed that she learnt the ‘whole picture’ of health issues when given an assessment task for high-risk identification and clinical management in the hospital clinical setting. For example:
I had a pregnant mother with heart problem ... followed her up during pregnancy, delivered her myself ... gave postnatal care ... followed up on her and [her] baby in the village where they live ... I saw the case study and presentation was helpful, and I learnt a lot.

In contrast, Bukinan preferred evidence-based assessment and practice, indicating that: ‘tutor [must be] there is person [to] see the evidence and assess us [in community and clinical assessment]’. Further supporting evidence-based assessment, Jena explained that: ‘the assessment was evidence based. For example, we dug up a new toilet ... [to provide] evidence of healthy living and they assessed us [therefore] the community councillor and village elders should give report on how we performed’.

Naik Mendo stated that a case presentation assessment prepared him for public speaking—a vital communication role in public health and the clinical setting: ‘standing in public—I have not done this [before] ... now, I can confidently stand in public and talk, and talk without fear’. When giving feedback on how community assessments were conducted, Salina stated:

the tutors asked VBA and VCHW on what was taught ... then [gave] a return-demonstration on, for example, weighing and plotting of child weight graph and interpreting it ... if they did answer and did well and pass ... I passed also in my assessment.

In support of return feedback assessment, as documented in Chapter 4’s curriculum mapping, Sakul stated:

I think especially in the village community level, the way we were assessed through VBA/VCHW was fine, but [should] also include village leaders [and] councillors so they can be supportive to this kind of program ... I think this is a good program and everybody needs to know, especially in the community.
Kumin stated that she felt that there had been insufficient or incomplete participation by clinical staff and supervisors in clinical assessments: ‘we should have clinical supervisors supervising and assisting us in what we were doing ... [there was] no one to help us with our queries in the clinical setting’.

In University A’s BCMCH curriculum, graduate assessments were conducted in a clinical setting in both the community and hospital. Although different means of assessment were used, the preferred method was return-demonstrations, which reflected evidence of students’ performance in the community. Many participants stated that they wanted to see feedback assessments on the strengths and weaknesses of the village placement, in which village leaders and elected village councillors participate as partners in the assessment, as opposed to only academics being involved.

5.4.11 Recommendations for future program implementation.

In terms of recommendations for future improvements in the program, most participants wanted to see the University A double major offered again, with new assessment criteria such as return demonstration and feedback for assessment, more case study assessment. Included also were causes such HIV risk factors, treatment option, medicine compliance and palliative health support for critically ill including extended community rural placement. In order to cover all the additional components, it was considered critical to extend the length of the course to more than two years with a double major component given the multi task activities conducted during the community practicum. The graduates recommended a two year program. Naik Mendo stated that it was a:

[university A program was]very, very good program, many important things to learn, very rural type, bottom-up changes needed, special program, impart
knowledge to remote community, program that will eliminate root causes of illnesses in PNG [therefore] suggest to continue this training.

Linapo requested that University A: ‘bring back BCMCH course; double major must come together, mother and child [education] come together or separate, and conduct as two separate majors [currently done] and extension of training timeframe to two years’.

Menjo recognised the BCMCH module on VBA and VCHW training as: ‘Very important [must] prioritise training [with] ongoing VBA/VCHW training.[There must be] continuous follow-up of performance of VBA[and]VCHW after training and government assistance in terms of incentive for VBA/VCHW’.

Sakul suggested further participation from the community in the form of feedback:

Community feedback on impartation of skills and knowledge from leaders, ‘hetman’ teachers, pastors, community assessment by non-participant for evidence [identifying evidence of change in the community, such as digging toilets, cutting grass, planting flowers and a clean environment] and performance assessment of VBA/VCHW after several months.

Bukinan wanted to see: ‘Increase [d] manpower with proper qualification [doctorate and masters] in both education and clinical facility’. Ruthy suggested that future courses: [Educational facility] “provide adequate and updated teaching and learning resources and prior to conducting programs [such as] computers, reference books, lab for practical, mannequins and enough teaching staff”.

Maline recognised that the community-based curriculum was oriented towards PNG-specific problems and suggesting including ‘health education, IT [information technology], management skills’. Helena requested including ‘Scanning knowledge and skills in curriculum,’ while Ruthy wished to see a topic on ‘Palliative care and follow-
up for women with reproductive cancer [but] remove less perform skills [such as] lumber puncture’. Importantly, Naik Mendo also suggested the need to: ‘Involve men and boy[s] in future VBA/VCHW training, and initiate self-help strategies and projects for [the] community’. Maline stated that: ‘BCMCH program [seen as] relevant for rural nurses [therefore] selection criteria target [must] rural nurses’.

Given the purposively sampled graduates’ responses and recommendations regarding the strengths and weaknesses of University A’s curriculum in preparing for practice, it can be contended that the previous BCMCH curriculum was considerably successful in meeting the aim and objective (see Chapter 3). However, specified improvements to course content, length and assessment were needed.

5.5 Conclusion

The graduates indicated that the perceived knowledge and skills transfer from the curriculum was sufficient, yet lacking due to a variety of factors. The graduates generally stated that they had acquired core curriculum knowledge in both theory and clinical practice. This knowledge was seen to enable them to practice in maternal and child health nursing in PNG’s low-resource context. Their main focus was on the nature and quality of learning that occurred during the rural clinical placement. The graduates stated that the factors that contributed to substantial learning were largely in the community practice setting. These factors involved immediate public health exposure and community education experiences that comprehensively transferred knowledge and skills to VBAs and VCHWs to enable enhanced clinical practice.

The participants testified to acquiring new education knowledge and skills that were perceived to have led to professional behavioural changes. In addition, the BCMCH program was considered to enhance the career prospects of the graduates
interviewed. Following graduation, the graduates had obtained promotions, engaged more fully with ongoing profession development, and felt prepared to undertake greater management responsibilities due to their education.

In respect to the suitability of the BCMCH curriculum assessments for knowledge retention and clinical skills/competency, the core assessment tasks in advanced maternal health and advanced child health (see Chapter 2) in individual high-risk case studies (for either mothers or children) were seen to considerably improve the participants’ skills. In addition, the village-based assessment and health promotion campaign (promoting healthy villages, proper toilets and rubbish disposal) and health education on disease prevention were also seen as critical for addressing the underlying social determinants that contribute to maternal and infant outcomes. According to the participants, the value of the rural placement derived from the fact that they were situated in and assessed on real-life settings. However, of note is concern regarding the considerably limited classroom resources available to support students’ clinical acquisition and associated village clinical practice.

This chapter has discussed the strengths and weaknesses of the BCMCH curriculum in transferring knowledge and clinical skills to graduates. The findings in this chapter enhanced and extended those from Chapter 4 on University A’s BCMCH curriculum mapping. The concluding chapter will expand on the graduates’ recommendations and how they can be implemented at the policy and tertiary education levels.
Chapter 6: Birthing and Child Health Knowledge and Skills

Transfer to VBAs and VCHWs

6.1 Introduction

This chapter presents the thematic findings derived from the focus group interviews with the VBAs and VCHWs. The findings address the two primary research questions related to the strengths and weaknesses of the transfer of knowledge and skills to VBAs and VCHWs. This chapter commences by outlining the demographic background of the VBAs and VCHWs in order to provide context. It then introduces the main themes identified, before summarising the major strengths and limitations of the data collection and findings for all phases, and discussing the extent to which the research questions were addressed.

6.2 Demographic Data

The VBA and VCHW focus group discussions consisted of six to seven participants in each of the three focus groups. The focus groups are identified henceforth as FGP (focus group participant) with an assigned number for each group—specifically, FGP 1 for one highlands group (seven participants), FGP 2 for another highlands group (six participants) and FGP 3 for a coastal region group (seven participants). The participants comprised 18 females and two males within an age range of 30 to 60 years. Among the participants, four had not attended any formal schooling, 10 had completed only Grade 6, and six had completed Grade 10. The focus group members were mostly married, with a few either separated or divorced. The majority had children, with four participants having more than seven children, 12 participants having six children or fewer, and one participant having no children. All 20 focus group participants were trained as both VBAs and VCHWs. The demographic data supported
the definitions of VBAs outlined in Chapter 2, which contrasts to the historical term ‘TBA’.

Four focus group members reported having fewer than eight years of experience in delivering babies, while 16 participants reported no previous experience in delivering babies prior to their VBA and VCHW training. This included both the male participants. Among the focus group members, 19 reported having delivered 10 or fewer babies, while one group member had delivered more than 11 babies in his or her villages. The focus group participants reported referring to health facilities antenatal women, babies, men and other women in the community for immunisation, antenatal care or management of an illness. All participants stated that there had been no maternal deaths experienced during their practice since University A’s program training, with two participants witnessing stillbirths and one neonatal hospital death upon referral.

Each of the focus group interviews were conducted in Pidgin or ‘Tok Pisin’ (PNG’s national language), which was later translated into English by the researcher, and transcribed prior to thematic analysis. The focus groups that provided the empirical data used to inform the study were conducted in three locations (two in the highlands and one in a coastal area). These locations accommodated the VBAs and VCHWs trained by University A’s BCMCH students from 2005 to 2009 (see Chapter 3).

The themes identified from the focus group discussions are further explored in the remainder of this chapter to address the primary research questions of examining the transferability of the BCMCH graduates’ theoretical and clinical birthing knowledge and skills (Chapter 5) to the VBAs and VCHWs in the aforementioned locations in PNG. The VBA and VCHW participants remembered well the training they undertook eight years back as reflected in the reported testimonies of the changes they witnessed and activities they participated in during their training. Pseudonyms are used in the
reported testimonies to de-identify the participants, in accordance with RMIT University’s and PNGMRAC’s ethical requirements.

### 6.3 Overview of the Main Themes

The following section outlines the main emerging themes and subthemes from the focus group discussions in both the highlands and coastal region (see Appendix 4). The overview of the main themes introduces the themes that will be discussed in detail. In ‘comparing past to present in village mamas’ and papas’ perspective’, the focus group participants gave an account of the new knowledge they had received that cleared their perceptions of certain practices. In the theme of ‘losing blood and saving lives: recognising the problems and their effect on women’, the FGs recognised the importance of timely referral and the consequences this may have for women. The theme of ‘banana/palm leaves and childbirth’ explored the use of clean surfaces to conduct village deliveries as a replacement for a clean birthing kit.

In the embedded subthemes of ‘saving a baby’s life through looking for “too sick” signs’, the FGs discussed the ‘too sick’ signs they were taught to identify, and the criteria to make timely referrals. The VBAs and VCHWs also gave accounts of the ‘trust and recognition’ they had received that motivated them to do the work they were trained to perform. As a result, they were eager to move into nearby communities to ‘go the extra mile to reach the unreached’. During and after the VBA and VCHW education, the FGs stated that the information they had received affected their conduct of health education, and family planning enhanced their knowledge of the risk factors of ‘unplanned pregnancy and family planning’, and indicated how limited their previous knowledge had been. The theme of ‘limited knowledge and new encounters’ emphasised how new education enabled new approaches to health care interventions. Health education on ‘promoting growth and protection for health outcomes’ was also
imparted to mothers and their infants who saw VBAs and VCHWs, which enabled
better community health outcomes.

6.3.1 Comparing past to present in village mamas’ and papas’ perspective.
When comparing past community knowledge and living standards to current practice in
the community, the VBAs and VCHWs as ordinary village women (mama) and men
(papa) testified to observing ‘a lot of changes to their village’. These included the
community placement of the BCMCH students, which enhanced the transfer of new
knowledge for better practice, including information about clean living, in which the
students provided knowledge to diminish beliefs about witchcraft and sorcery. Further,
the VBA and VCHW participants stated that they noticed less people blaming sorcery
and witchcraft for deaths due to people knowing the true cause of deaths in the
community. The VBA and VCHW participants felt that they could now ‘do things that
they were not able to do in the past’ due to the additional knowledge gained through the
education. They realised that the knowledge they were getting was ‘free’, and that they
and their fellow villagers were able to live similar lives to people in towns and cities.
The participants appreciated the students from University A living in the community
and providing knowledge and training to them. Some of the changes encountered by the
VBA and VCHW participants related to a reduction of deaths in the community. A
second notable change was the general improvement in village living standards since
the introduction of University A’s program, as reflected in the following participants’
statements.

The acquisition of new knowledge gained during University A’s program for
better practice was supported by the participants, as reflected in the following group
discussion:
I did not know about VBA work. I used to just look at the women when they delivered their babies and when mother or baby die, we thought it was normal. We were just observing, but this training open[ed] our eyes to see these things. (FGP 1: Akie)

We learnt that women die and women have problem when they have their baby. Death of mother and baby—we must stop it. (FGP 1: Orua)

We helped and many mothers and babies have not died. (FGP 1: Urei)

Another difference the VBAs and VCHWs noted was the clean living created for them and their communities:

Typhoid and diarrhoea affected us [and] we blamed sorcery and witchcraft.

Training on healthy home came in, brought information on getting rid of diseases ... typhoid and diarrhoea completely went away from us when we had healthy home in the community. (FGP 1: Lina)

Nurses showed me to clean the place by cutting tall grass, dig toilet and put pipe in release smell for fresh air, window in the house for fresh air, cupboard, dish rack, clothes lines, flowers gardens, hand washing facilities and dispose waste in the toilet. (FGP 1: Orua)

In recent times, it has been anecdotally noted that beliefs in sorcery and witchcraft have increased in the PNG highlands, with many men and women being tortured and killed as a result; however, traditionally, sorcery was considered a coastal practice. The coastal VBA and VCHW participants confirmed that these beliefs were not isolated to highlands region, but also experienced in the coastal areas. When reflecting on cultural practice prior to the VBA and VCHW education program, some participants stated:
When the program has not come into the community, very big problems [birkpa hevi] used to occur—deaths occurred often, many children died close together, and we blamed poison or witchcraft, but now no problems are occurring. (FGP 3: Bibi)

In the past, sorcery and witchcraft were often blamed for illness and death. With the new knowledge gained from the program, the VBAs and VCHWs were able to identify and improve health practice: ‘Our living is very good, small cough or flu, malaria and fever are all gone—we are happy’ (FGP 3: Rosey).

The highlands participants noted that University A’s BCMCH student placement in the community enabled VBAs and VCHWs to change their way of living, and undertake more healthy activities in their families’ homes, which was then transferred to other villagers:

We did not know how to look after ourselves—lived and slept with dirty skin and clothes, no good toilets, no good house, dust-covered house, and living with animals. But changes came into our community and villages. (FGP 2: Skola)

Students showed us to wash plates, cups, clean house inside and outside, told us not to make fire in the house we sleep, cook in one house and sleep in another.

(FGP 2: Dowa)

In support of the subtheme of ‘not doing’ to ‘doing’ and ‘not having’ to ‘having’, the VBA and VCHW participants appreciated the difference the new knowledge brought for them personally, as well as for the community. The consensus was that the community education not only brought improved knowledge and skills, but also influenced the VBAs and VCHWs, their families and the community: ‘My living was not good. Now my dressing, washing, rooms have changes’ (FGP 3: Rosey), and
‘hygiene—we now have toilets, but pigs are now out of the fence and spoiling the place. We still need more education’ (FGP 3: Amune).

The VBA and VCHW FGPs also noted the importance of the knowledge they had received, and appreciated the ‘no paid’ knowledge, as reflected in the FGP 2 discussion:

many of us could have died and faced big problems [bikpela hevi]. Thank you to students coming to teach us how to live—they shared their paid education with us. (FGP 2: Skola)

We did not spend any money for this knowledge; if they did not visit, this change would not come. (FGP 2: Wapa)

they [students] gave us this knowledge—first time for us to get this knowledge. Training came to help us mamas in the community—no training; our lives would be in ruin [bagarap]. (FGP 2: Anet)

The VBA/VCHW participants acknowledged that the education they had received from University A’s students had caused comprehensive changes to their communities. They commented that they could ‘now live a modern lifestyle’ in their village huts and buildings made of bush materials, ‘just like those people living in town and cities’. This was illustrated by the following two participants, from the highlands and coastal region:

Their [students] level of education was high, but they left that behind to come live with us and help us. The way we lived, our culture, the way we eat—they taught us good ways. We must know and live like university people live. People in the village can live the same life like university people. (FGP 3: Wapa)

Service is students coming into our community, student living high-class lives. Scared to receive them in one way, but happy on the other—community and village changed through them. (FGP 2: Bertha)
There was general agreement about the value of the education received from University A’s students’ for example, FGP 2 (a highlands community) noted that this was the first time their community members had received information that could change their way of living. This was similar to comments expressed by the participants in FGP 1 (another highlands community) and FGP 3 (a coastal community). It was noted that the FGP 2 participants commonly lived three to four hours away from the main road, and over the mountain range without road access. Transport to government services, such as health and education, was comparatively difficult compared to FGP 1 and FGP 3 participants, who both lived in the vicinity of a road network and transportation. This was further supported by empirical evidence that lack of access to health facilities identified in the Marie Stops PNG (2011) remains a major barrier to the delivery of healthcare.

University A’s BCMCH program, although primarily focused on improving maternal and child health community knowledge among the rural population, had a further benefit of challenging local myths and health beliefs. This was illustrated when ‘healthy homes’ were introduced and reduction of diseases such as malaria, diarrhoea and pneumonia noted by the participants. This improvement to personal and family lives was reflected in the comments from the focus group participants. In comparing the past to present, the VBAs and VCHWs in all focus groups recognised the importance of saving the lives of women and children. Due to a previous lack of information, they had never considered certain knowledge to be important—such as when to send a pregnant woman or sick baby quickly to the hospital. This knowledge was now available to them.
6.3.2 Losing blood and saving lives: Recognising the problems and their effect on women.

While bringing new knowledge and skills, University A’s BCMCH community training also brought many inherent challenges as the VBAs/VCHWs adjusted to previously unforeseen complexities in health, as well as the social problems faced by women when accessing healthcare. The VBAs and VCHWs living only in the vicinity of the communities noted that ‘distance and transport’ were the major barriers to women seeking hospital births, and that this was not only an issue for those living in the most remote areas of PNG. However, specific VBA training modules—such as that provided by University A on identifying the risk signs for women in labour—were considered to have increased understanding and knowledge on ‘when and why’ to refer women who pose an obstetric risk to the hospital. One participant stated that: ‘People are reluctant to go to hospital. People in hospital get cross with them, criticise them. Some were scared of their body and went to hospital—others [were] coming to us for help’ (FGP 2: Akie).

The focus groups identified that birthing mothers found it challenging to access health facilities for a number of reasons, as stated by the following participant: ‘Difficult to access healthcare and mothers [women in the village feeling] relieved from finding difficulty with cost and transport to hospital’ (FGP 2: Dina). The participants in the second highlands focus group shared the same sentiment,

Training was to help women who are pregnant, [but the] health facility [is] far away from [the] village—women living in the bush, no road, or bus fare for support to hospital. (FGP 2: Dowa)

We are living in mountainous community—far distance, no transport, look for bus fare. (FGP 2: Skola)
We find PMV [a public motor vehicle to transport people] to escort women to and from hospital for childbirth. When VBAs has no bus fare, the client pays for us, but if we have [the fare], we pay and take them to hospital. (FGP 2: Josi)

Difficulties related to transport and its associated costs were also experienced by the coastal participants:

Death of mother and baby [were] seen as normal. We struggled or found [it] difficult to take patients to hospital to give birth—far distance [and mothers] give birth on the way to hospital. (FGP 3: Bibi)

Children have died going to hospital. [Now] we are saving the life of mother and baby and they are not dying—they are alive and well. (FGP 3: Amune)

After the program, there were changes to VBA practice and rural birthing outcomes that the FGPs saw as improving maternal and child mortality:

when this program had not come into the village, many women deliver and many children die and mothers dying—it is not good. We are trying to rush the mother to the hospital [but] they would die in the hospital and return ... this program brought big change to our community ... no deaths has occurred, not at all. No babies have died—we VBA mothers are here. (FGP 3: Nica)

The effect of the new University A education was highlighted by one participant stating that she now knew more about how to undertake deliveries for multipara mothers: ‘For a new mother, I must send her to hospital to give birth [but] if already delivered two or three times, I can deliver her in the village’ (FGP 3: Rosey).

The FGPs identified an enhanced understanding of medically sound reasons for saving the lives of women: ‘We learnt that women die and women have problems when they have baby. Death of mother and baby—we must stop it’ (FGP 1: Ames). Lina stated that she had now learnt to recognise many more specific maternal complications
during pregnancy: ‘women have problem in the community—this training came to save lives of women and babies in community. We now know when to take women to hospital—problem in pregnancy, we must refer’ (FGP 1: Lina).

The FGPss also identified having enhanced knowledge of the effect of HIV on village birth. They stated that they had been educated by University A’s BCMCH students on the risk of village-based births, and instead needed to refer women:

*Doctors now stopping us delivering [because of the] risk of HIV/AIDS, so ask to refer all mothers. Now concentrates on referral.* (FGP 1: Orua)

*we are sending all mothers to hospital for antenatal clinic and testing for HIV.* (FGP 1: Dina)

Due to fears of catching and spreading HIV/AIDS, the VBAs stated that they began implementing protective measures during the process of childbirth as a result of University A’s BCMCH student education:

*I check if I have sores on my hands and feet, I put plastic [shopping plastic] on my hands and feet, deliver the baby and give them ... Now I am frightened ... but I will still serve them as its people’s life ... I want gloves and boots ... I am mama in the village where do I get it from; I want to do the work.* (FGP 1: Ames)

All FGPss and the majority of rural community members in PNG are subsistence farmers with no means of financial support to access transport for obstetric referral or emergencies, unless by selling products at the market (Sicuri et al., 2011). The focus group participants identified gaining an understanding of the importance of timely and appropriate referral, and were eager to implement this. However, they acknowledged the need for increased and sustainable financial support, and the provision of essential medical equipment, such as birthing kits, from the PNG Department of Health.
The VBA and VCHW focus group participants generally appreciated University A’s BCMCH program, with its focus was on targeted community health promotion, specific clinical skills and new knowledge about referrals and risk assessment. The FGPs saw the University A student training as enabling the transfer of knowledge and clinical skills, thereby enabling them to provide more generalised healthcare for a larger population in the community. Accordingly, the FGP participants identified that they referred or escorted other villagers—in addition to mothers and children—for medical treatment at the health facility. All FGPs testified that the central obstacles to providing women and families with medical care in rural PNG communities are the lack of transport infrastructure, distance from medical centres, lack of equipment to provide appropriate care and lack of financial support.

6.3.3 Banana/palm leaves and childbirth.

Delivery techniques conducted in the past were reflected on by the focus group participants, and identified to be different to practice following the University A program. However, it was noted that preparation for childbirth was similar to previous practice, but with additional knowledge on how to examine pregnant women. VBAs when giving an account of preparing and conducting the delivery of baby in the village setting with limited resources on labouring women reflected on the acquisition of the new knowledge from University A’s program. Ames (FGP 1), an illiterate woman, was passionate about helping women in the community, stating that she primarily learnt through observation:

“Student taught me well and I received what they taught [they] showed me what to prepare when women is having baby [such as] hand glove, clean razor blade, clean plastic, clean bed and home, clean laplap (cloth), and if nothing [1]
prepared banana leaves, observe her when [she is] having the baby. Baby without sickness or problem will come”. (FGP 1: Ames)

A VBA in FGP 1 provided a detailed account of how they prepared and assisted a woman during labour:

Pregnant women wanting to give birth comes to VBA for help ... we ask if water has broken [referring to the membrane breaking], then tell her to go wash. We get ready our plastic [raincoat] and ‘han glove’ [gloves]. If the pains are coming close together, I would tell her to lie down and I will check and, if I see the hair of the baby, I will tell her to push. I will deliver the baby, clamp the cord in two places between the baby and mother ... cut with clean razor, put baby away and remove the baby’s bag or billum [placenta] ... check to see if any broken pieces or any small pieces in the baby’s road [mother’s vagina]. If deliver in the night, advise mum to seek health facility care for check and treatment. (FGP 1: Dina)

Participants in the coastal villages (FGP 3) also recognised the importance of preparing a safe, clean place for giving birth after receiving education from University A’s BCMCH students. Of note here is that the VBA’s were provided with clean birthing kits donated by Zonta Melbourne for emergency childbirth. The hanging scales for weight check during the VBA Training in the community were bought by the University and given to them by students:

in the olden days, there was no birthing kit—we used banana leaves or palm leaf [Limbum] and bamboos to cut cord. Nowadays, we have birthing kits [a clean scalpel blade, gloves, raincoat, two pieces of tie for the umbilical cord and soap], nappies and laplap [piece of cloth or bedsheets] to help women deliver. (FGP 3: Bibi)
when time for women giving birth, I must put women on clean laplap ... must sit and wait for baby to come out and I take the baby ... if baby’s bag [placenta] still in, I must put baby on the mother’s stomach—it will help the bag to come out. I must check the baby’s ears, legs, hands and to see if short or crooked [physical deformities] ... weigh the baby—if less than two kilograms, I must take to hospital. (FGP 3: Feino)

Another critical feature of the clinical education and skills received from the BCMCH students was that of examining pregnant women and educating them on self-care and preparing for their baby:

we would sit in groups and discuss how pregnant women [bel mama] would take care of herself—tell her to rest and not to carry heavy load, exercise and eat plenty vegetables for baby to grow. (FGP 2: Skola)

The students also taught and showed the VBAs:

to check for sores on head, eyes if pale, check body for swelling of hands and feet, ask if women see blood or discharge in her genital area. [If she] had operation before, we send her to hospital, and VBA must not keep this woman.

One thing they did not teach me was, if they have sores, what cause it to happen or if they have swollen feet what cause it to swell. (FGP 2: Skola)

The participants in one of the coastal community FGPs mentioned that they were taught theory related to undertaking a full body check on pregnant women, but did not receive any demonstration of or involvement in performing the actual procedure of checking antenatal women:

[The student taught me] how women would deliver, how I will deliver the baby, how to clean the baby, cut the cord, weigh the baby and read the scale. [They] taught me on type of problems baby might have during childbirth ... [but] I did
not check any one ... I lied down and checked myself with the information I got ...
... check[ed] my baby’s head myself when I was pregnant, [but] I did not check anyone under supervision. (FGP 3: Feino)

[The student] taught me on how pregnant women would encounter problems, how pregnant women can live without problems, taught me how women get pregnant and have baby, what to tell pregnant women and her husband to prepare, [such as] baby powder, oil, shampoo, nappies, blanket before the mother delivers, but did not show us how to check pregnant women. (FGP 3: Rosey)

One participant with many years of experience assisting women during pregnancy identified what she had learnt about the process of completing an antenatal check for pregnant women:

For me, I check my in-law under supervision of student—head facing the baby’s road [vaginal canal], baby moving [foetal movement], head still moving [head mobile]. With the knowledge I got, I can help women in the community. I checked myself when pregnant, I delivered my baby myself—no one helped me. I delivered twin babies of my sister-in-law and a 15-year school girl with her first baby. (FGP 3: Nica)

After receiving similar knowledge as in the FGP 3 on checking and preparing pregnant women for birth, the highlands focus group members (FGP 1) stated that:

we check the women to see if the baby is lying across [transverse lie] or lying straight with head down and legs up in abdomen [demonstrated using his hands]. If the head is not down, we help the women go to the hospital. (FGP 1: Orua)
Another FGP participant in the same group outlined what she had learnt about maternal care postnatally in the village: ‘*those that deliver in the village, we sent them to the hospital for check-up. We enjoy helping and happy in doing the job, and also do home visiting on family who are sick*’ (FGP 1: Akie).

The successful transfer of educational knowledge and skills from University A’s BCMCH program was found among the different focus groups, with repeated testimonies of the acquisition of new knowledge. This new knowledge was specifically related to preparing pregnant women for childbirth, checking and examining pregnant women and providing advice on how to prepare for delivery of baby. In some circumstances, the FGP testimonies alluded to conducting deliveries using the newly acquired sequential delivery steps as a core feature of contemporary evidence-based midwifery practice. This reflected successful transfer of knowledge and skills from University A’s curriculum.

In the past in PNG, women commonly gave birth alone, often with little assistance from family members, or some assistance provided by elderly women thought to be TBAs. Preparation for childbirth and examining of pregnant women were not considered important, although women undertook their own preparation. In this study, the focus group in the highlands discussed receiving demonstrations of how to prepare women for childbirth and examine pregnant women, and they were taught the correct approach to conduct delivery of baby. However, this was not the case for the participants in the coastal region. The coastal region participants testified to learning about preparation for childbirth, but not witnessing any actual delivery of the baby demonstrated by the students as part of their training.

The various focus group participants indicated that the knowledge and skills transfer from University A’s community-based nurses provided information on
preparation for birth in case of emergency, and using appropriate aseptic techniques in
the absence of skilled birth attendants (nurses and midwives) in the community to
prevent puerperal sepsis from unhygienic village birth (Sanga et al., 2010).

**6.3.4 Saving babies’ lives by looking for ‘too sick’ signs.**

The VBA and VCHW participants were taught a variety of new clinical skills
from University A’s program in their training as volunteers in the community. The
emphasis was on the health and wellbeing of mothers and babies, as members of the
family unit. Thus, these cohorts of University A’s BCMCH students (from 2005 to
2009) specifically focused on training the volunteers in the community
(VBAs/VCHWs) to identify at-risk children in order to prevent infant and child
mortality. In addition, referring those who needed early healthcare and treatment was a
critical feature in supporting MDGs 4 and 5, as outlined in Chapters 1 and 2. The VBAs
and VCHWs discussed ‘using the doctor’s eyes’ (Skola) to recognise “too sick” and
“not too sick” sign’ (Skola and Dina), and which signs and symptoms to look for in
different age groups in order to save babies’ lives in the community. The FGP
participants stated:

> In this training, they taught us to be doctor’s eyes—with our eyes, we have to
> observe and see if the child is too sick or not. When we see the child is sick, thin
> and has big tummy [abdomen], diarrhoea, plenty sores and crying a lot and not
> breastfeeding well, we tell the mother, ‘Baby is sick, take him quickly to
> hospital.’ (FGP 2: Skola)

> When we see the babies are sick with ‘skin hot’ or yellow [pale] skin, not eating
> well or breastfeeding well, we know they are sick and refer them quickly to
> hospital. (FGP 2: Dowa)
When discussing how to identify a sick child, another FGP participant noted: ‘If the child’s hands and legs are skinny [malnourished], skin in the eyes go in [sunken], we know this child is sick. We must take then quickly to the hospital and save them’ (FGP 2: Josi). The outcome for sick children prior to University A’s BCMCH program was identified by one of the FGP member as follows: ‘In the past, we did not know if the child was very sick or not too sick—we just let them stay in the village and the child died’ (FGP 2: Skola). Identifying ‘too sick’ signs was not isolated to one highlands community, but also noted by the participants in other highland communities, who identified their ability to recognise the difference between ‘too sick’ and ‘not too sick’ after receiving training from University A’s BCMCH students: ‘In the past, we did not know if child was “very sick” or “not very sick”. Child was left to stay and die. But those we assisted [are] now at school, breastfeeding or are big’ (FGP 1: Dina).

The focus group members also raised concerns about the support provided by parents when caring for their sick children. One FGP one member stated: ‘Parents are not concerned when children are sick in village—most parents have difficulty with [the] transport fee to seek medical advice’ (FGP 1: Anasa). Of critical importance was the financial assistance provided to parents by the VBAs, as emphasised in University A’s training: VBAs assist parents financially with transport cost to take baby to hospital in the case where the parents were financially handicap. We make it our business [responsibility] to check and escort to hospital’ (FGP 1: Akie).

As well as looking for ‘too sick’ signs and high-risk children, the other new knowledge and skills transferred from University A’s program to the VBAs and VCHWs included checking children’s weight, checking for a large abdomen, and checking for diarrhoea: ‘We did weight check and identify danger signs, advised accordingly or if the child is thin, with big abdomen, diarrhoea or plenty of sores—we
*tell mother to take quickly to hospital*’ (FGP 1: Orua). Neonatal stimulation was also identified as a new role undertaken by the VBAs due to University A’s education received. This was explained by the FGP as identifying and reviving a baby who was born ‘flat’ and needed to be stimulated by slapping the baby’s feet:

*One baby I delivered, the baby was dead. I was afraid and told the mother that baby was dead. I was told during the training to turn head down and legs up and slap the foot. I did that five times—the baby got shock and cried. I left the baby to rest. When I came back in the evening, I saw the baby alive—I was very, very happy.* (FGP 1: Anasa)

Participants in the coastal focus group also stated that they were taught to identify signs of the commencement of different infections in various age groups:

*I was taught how I can recognise the baby with problems at birth, what sickness to find in one-month to one-year baby, like the baby will have ears swollen, red eyes, crying plenty. In a [child aged] two to five years, they will be lazy or weak and sleep a lot.* (FGP 3: Amune)

*[When children aged] one to five years ... are sick, malnourished with distended abdomen, child cough and ribs goes up and down and ‘pump strong’ and child vomits, we know he has shortness of breath—we quickly take them to hospital.*

(FGP 3: Feino)

Further, in recalling the education received to check sick children, another coastal participant stated that a student:

*taught me on ways that the child will get sick, the starting point for infection, such as malaria, diarrhoea and ear pain ... [for] sickness like malaria, signs to see will be red eyes, baby will cry a lot, skin hot—then it’s malaria. [If they
have painful ears, pus in ear, cough, running nose, I must refer ... signs in newborn are different to [children aged] two to five years. (FGP 3: Nica)

The participants in the highlands focus group also noted the importance of recognising the ‘too sick’ signs: ‘One-year-old child with fever will cry a lot, eyes will be red, skin pale and will vomit, and not sucking from the breast—I must quickly take this child to hospital’ (FGP 2: Bertha). Another stated: ‘Diarrhoea [pekpek wara], will have dry skin, eyes sunken, no strength, not want to take food or milk, cry a lot—we must rush to hospital’ (FGP 2: Dowa).

The trained VBAs testified that their new child health knowledge and skills in identifying and providing urgent referral for children at risk of losing their lives promoted the health of the village children. This was directly due to training of the VBAs and VCHWs in the community through University A’s BCMCH program. The focus group participants stated that they believed they had saved the lives of children who had subsequently grown up and were now attending schools in the community.

In summary, the responses of the participants suggested that University A’s program from 2005 to 2009 had enabled the volunteers to contribute to reducing infant mortality, in compliance with the PNG national health key priority areas for reducing child mortality (MDG 4). In PNG, although infant mortality rates have slightly reduced from 52/1,000 in 2009 to 48/1,000 in 2012, the country is still ranking highest in the Oceania region (The World Bank Group, 2015), as outlined in Chapter 2. These data identified that there is still much needed in PNG to meet the MDGs in reducing infant mortality. The PNG Development Strategic Health Plan 2010 to 2030 aims to reduce mortality in children aged under five years from 75/1,000 by 2030 (Government of PNG, 2010a). To achieve this ambitious goal, a critical aspect is partnership with community-trained volunteers, as seen in these FGP testimonies.
6.3.5 Trust and recognition for better birth outcomes.

The recognition and trust given to VBA and VCHWs to perform their full scope of practice gave them a sense of being able to aspire to perform the role better. The FGPs testified to feeling that they were trusted and recognised by pregnant women, people in the community and hospital staff. This trust was most evident from the staff who were involved in training the VBAs and VCHWs in the community during University A’s program, and were working in an obstetrics and gynaecology unit, child health clinic or ward. The highlands focus group members stated the following:

*in my community, they trust the work I do, they know that we are nurses in the community … women who are pregnant come and I check them … I am in the village and busy doing my work in the garden, they came and call me … I will go check them, advise them or take them to hospital. They trust me as a nurse and many come and ask me for advice or to give ideas for children or pregnant women to save them. This is what I do in the community and the community knows me.* (FGP 2: Dowa)

*Pregnant women seek help from VBA—will come and call for help when in labour. When busy with garden work, we leave what we are doing and attend to them or take them to hospital, and happy to do the job.*

In discussing the same sentiment of recognition and trust from the community, the other highlands participants recalled being recognised as the ‘eyes and ears’ (Orua) for doctors and nurses:

*Community will come quickly and say, ‘Nurse, the child is sick’, and you will help them … we take them to hospital … nurses in the hospital recognise us and they serve us quickly and save the child, and I am happy with approach and assistance from nurses who trained us.* (FGP 1: Akie)
We are helping the community and becoming eyes and ears of the doctor in the hospital. (FGP 1: Orua)

Evidence that the community trusted the VBA and VCHW was evident in much of the group discussions: ‘Many forgot [were not making an effort] to go to the hospital; they come for delivery [of their babies] knowing nurse [VBAs] are there’ (FGP 1: Urei).

Of interest was that the BCMCH nurses in the hospital were seen to recognise the capacity and knowledge of the VBAs in the highlands region, whereas the coastal region VBAs and VCHWs were perceived to receive more recognition from their community:

When we are walking around in the village, people approach us when they are sick and we advise them to take to hospital ... Our family members also look for us to help them. (FGP 3: Nica)

For me and for the work I do, sick people come to me also, they find me ... one with sore, I help them—I tell them to go to hospital ... not getting better so helped them with herbs and now better. People seeking help from VBA do come to me. (FGP 3: Amune)

The training of VBAs and VCHWs in the community brought recognition from communities, families and the health sectors. The VBAs and VCHWs in the first highlands group testified that the health workers in the hospital recognised them and gave priority to serving them and their clients. However, this was not experienced by participants in the second highlands focus group or coastal focus group. The location of the university, hospital setting and University A’s program students who acted as trainers for the VBAs and VCHWs may have contributed to the perceived advantage of the first highlands participants, compared to those in the other two focus groups. All
focus group participants reflected that the village women trusted the VBAs and VCHWs when seeking help during labour.

This trust and recognition of VBAs is not only isolated to pregnancy and birthing. A 2002 Gambian study involving TBAs in preventing HIV transmission also found that TBAs were trusted and recognised for sharing the same cultural and health beliefs, and strong community ties (Bulterys, Fowler & Schaffer, 2002). Bulterys et al.’s (2002) study identified that, although some community settings had health services nearby, the women in rural and remote communities identified that they would rather seek VBAs/TBAs due to convenience and trust. These results were identified both in the current study and in a study by Titaley, Hunter, Dibley and Heywood (2010) on why women prefer TBAs, conducted in West Java, Indonesia. In the current study, the focus group participants appreciated the trust and recognition given to them by their communities.

### 6.3.6 Going the extra mile to reach the unreached.

Around 85% of PNG’s population live in remote rural communities surrounded by rugged mountain ranges, with tropical rainforest and wetlands in the coastal terrains. This makes it very difficult for many people to access government health services (Culture of Papua New Guinea, nd). Most focus group participants expressed their eagerness for University A’s program to be reintroduced to enable them to reach other nearby communities. A commonly expressed concern was associated with the need to access more remotely located mothers and children, who would also benefit from enhanced VBA/VCHW knowledge and skills. Many focus group participants identified needing a ‘paddle’—an expression that refers to needing a canoe paddle to help push ahead against water currents or difficult situations (Ames and Urei). They needed this assistance to reach outer communities, and requested that similar training to University
A’s program be firmly established until it ‘bears fruit of success’ (Orua and Wapa).

When discussing needing a ‘paddle’ or assistance, the highlands focus group members stated:

*we VBAs, we live in the village and [are] close to people—mothers and babies. People see that we can do bringing changes into the community … we want to move and help women living further in other inland community that are facing problem. We need assistance to reach unreached communities—mother and baby dying in the process of referring to hospital from far distance.* (FGP 1: Dina)

we see many need help and we cannot help—we have no money to help people in the community, we face shortage our self. We need [a] ‘paddle’—we need assistance, government assistance, we need car and delivery pack or birthing kits for emergency. (FGP 1: Ames)

Further supporting the need for a ‘paddle’: ‘to me, doing this work is a volunteer work, with my heart I am working. If I have a “paddle”, I would be happy to continue doing this work’ (FGP 1: Urei).

The participants in the second highlands community also stated the need for assistance in reaching other communities:

*they [students] taught us many new things and we are reaching to other neighbouring communities—helping, encouraging and advising them and we are doing this job … this training was very good—we want this training to return and help us women in the community to make it go further to help women living in the bush, where there is not road for car or any means of finding money to support.* (FGP 2: Dowa)
The participants also discussed the almost complete lack of medical and birthing equipment: ‘we need house to store equipment and check mother and baby, or deliver baby ... we don’t have things to use to check people—for example, weighing scale to weight baby’ (FGP 2: Josi). The FGP 2 members appreciated the medical assistance previously provided by the students on community placement, stating that: ‘students also brought medicine and injection into the community ... we were living with sickness and they helped us’ (FGP 2: Skola).

The focus group members recognised the importance of having sustainable and continuous projects to promote a healthy community in the long term. A common request was for University A’s program to return until it ‘bears fruit of success’. The second highlands focus group participants stated that:

University brought good things to community, things not known in the past, program must return ... bring back the work—work must come back.
Need support for it to expand to other districts and province. Country must see result of healthy home. (FGP 2: Wapa)

The VBAs and VCHWs saw improvement from their involvement with University A’s students. This resulted in initiating and building a road in partnership with the community as a self-help project to link the village to the main highway. This was the first project of its kind:

to make this work go ahead and [be] recognisable in the community, village, district, we will need road ... they came and told us to build road—we have done that and [now] grass have grown over it ... we need house to store things ... we need water supply to help people in the community ... I want to say again, the students that came and introduce this program—don’t come and [then] go stay [away for] two, three or four years until we forget this ... you must come every
year and make this work progress further … this is our need and the desire of our heart. (FGP 2: Skola)

The importance the village communities placed on University A’s VBA and VCHW training was highlighted:

People not trusting us and the work now not continuing … you will come back and teach us, teach us more. If you don’t return, we will forget what we have learnt. [But] we can progress and community can see our work. (FGP 2: Skola)

The highlands participants also recognised the need for continuous training using evidence-based support to enable changes in practice:

Let project stay in one council ward or in one community for at least four to five years … it will strengthen the community to improve and will last longer, before moving to another council ward or community. When the community bears fruit and move to another community, then it will be good. It has not bear fruit—that’s why people’s moral have gone down, community has fallen … community has collapse[d]. (FGP 1: Orua)

The imperative for the previous University A training to be recommenced and continued was highlighted as follows:

plenty of thing[s] we learnt in the first place, but cut short and gone to another community or council ward … when we have not completed this work … it has fallen [failed] … people are not trusting our work … The program must come back to the same community … and it can go to other council wards. (FGP 1: Lina)

The participants from the coastal community also expressed their experience of changes in their community, and called for the reimplementation of University A’s program:
we want this program to come back and move further into the bush [remote] areas, as they are now facing this problem of women delivering and, in the process of rushing women to hospital, the mothers and baby dying along the road ... they have not gone into this program. (FGP 3: Nica)

Now, our living is good ... small flu and cough, malaria and fever now gone ... this program must move further into other communities. (FGP 3: Zabeth)

We all agree, this training is good, Stay longer, two to three months, and teach us. (FGP 3: Bibi)

The participants from all focus groups insisted on the return of University A’s program, with suggestion that it be supported by financial assistance from the PNG government. The communities where University A’s program training was introduced were seen by the VBA/VCHW participants to have experienced many changes, with students going the ‘extra mile’ to implement other self-help projects, such as those experienced by the participants in the second highlands focus group. While the first highlands focus group and coastal focus group participants appreciated the training and changes that occurred in their communities, they recognised the importance of having sustainable training or projects before moving into other communities.

The focus group participants recognised that University A’s program had improved maternal and child health outcomes in their communities, and called for reimplementation and expansion of the training to nearby communities. The focus group participants universally identified their need for assistance to perform their role and assist those with health concerns. They stated the need for birthing kits, houses to store supplies and check pregnant women, weighing scales, transport and financial support. Many similar programs and projects were previously conducted in PNG, but were found to be non-sustainable, mainly due to a shortage of funding and villagers not
taking ownership of the projects. These issues regarding sustainability and lack of health infrastructure and equipment were also seen in projects implemented in the Solomon Islands and Vanuatu (Schoeffel, 1997), with similar outcomes.

### 6.3.7 Unplanned pregnancies and family planning.

The VBAs and VCHWs in coastal communities identified changes that targeted education in family planning had caused in the community during University A’s program. This theme may have been identified in the highlands focus group because the VBAs and VCHWs in these areas had non-Catholic backgrounds; thus, family planning was not discouraged. In contrast, non-adherence to family planning was seen predominately among the coastal participants, who were Catholics—a religion that prohibits family planning (Thompson, 1985). The formal education given by University A’s students enabled the villagers to be open to considering activities of family planning, as indicated in the FGP 3 testimonies:

*Program of family planning brought big change not like before—plenty mothers now on family planning, now planning their family to three to four years apart.*

*Women on family planning looking younger.* (FGP 3: Amune)

*In the past, doctors and nurses just visit and gave awareness … [but the] students taught me on family planning [and] I am now talking to mothers and fathers to plan children.* (FGP 3: Nica)

*Students living in the community brought changes into the life of VBA and family line … I feel really satisfied—don’t have any problems now … [but] need someone to talk to leaders to support this change.* (FGP 3: Feino)

Not only did the VBAs and VCHWs witness changed attitudes towards family planning information, and the uptake of that knowledge in families and communities, a further benefit was that the VBA and VCHW attendants were able to provide support for the
issue of teenage pregnancy. In the past, a lack of information provided to teenagers on
safe sexual activity led to underage pregnancy:

*I helped delivered 15-year-old ... in Grade 6 ... did not go for clinic, took care
of her in my house, fed her with vegetables, her mother came and helped. I
delivered the baby, both mother and baby well, no [perineal] tear on the
mother—taking baby for clinic tomorrow.* (FGP 3: Amune)

*I delivered a 18-year-old Grade 7 student—first baby, got her baby well ... she
had a [perineal] tear, but healed up with antibiotics. Mother and baby okay and
sitting there [points at them].* (FGP 3: Bibi)

Teenage pregnancy and mothers weakened from giving birth to many children close
together are common health concerns in PNG society that have been attributed to
increasing maternal mortality (Sanga et al., 2010). The focus group demographic data
indicated that the majority of the coastal participants had between six and 10 children in
their family, compared to the highlands participants having less than seven children.

A WHO (2010) protocol on high-risk pregnancy mandated that any woman
having a child under the age of 16 years, and/or having children at close intervals are at
higher risk of having obstetric complications. The participants in the highlands focus
groups mentioned that, while they were taught family planning, they had not assisted
women to undertake family planning and had not delivered teenagers (although some
tenagers identified that they were delivered by these VBAs/VCHWs, as discussed in
Chapter 7). Three pregnancy-related deaths involving teenagers under the age of 19
were reported in 2009 in the Eastern Highlands province, and there may have been more
accounted for (Sanga et al., 2010).

The interviewed VBAs and VCHWs identified that they had assisted teenagers
during pregnancy, but did not consider these pregnancies to be a health risk. However,
the new knowledge from University A’s BCMCH students changed their opinions. They also testified to the transference of much other new knowledge and many clinical skills that expanded their awareness of health issues.

6.3.8 Limited knowledge and new encounters.

Although the participants in all focus groups appreciated the new knowledge provided by University A’s program, it also created increased anxiety and confusion about situations that they previously would not have identified as dangerous or unsafe. The participants in the first highlands focus group mentioned encountering many confusing situations. For example:

*The nurse did not teach us about mother who is three to four months pregnant and losing plenty blood ... I was confused when mother four months pregnant and she lost blood ... she had the same problem for the first and second pregnancy and lost the baby.* (FGP 1: Lina)

One highlands participant observed a TBA not involved in University A’s program, who believed that a mother had a second baby in her uterus. She got the mother to push, which resulted in a prolapsed cervix—or, to her interpretation, a ‘prolapsed uterus’ (‘bilum bilong bebi’ or ‘baby’s bag’). She stated:

*another woman in the village delivered her ... baby came ... they thought she had another baby and asked her to push, and she continued pushing and nothing happened ... They called me at 2.00 am ... I came and checked, but there wasn’t any baby ... only the ‘billum’ [bag] where the baby was sleeping came out. I got the gloves and pushed it back ... I was not trained on this ... I was confused about it.* (FGP 1: Akie)

Evidence-based knowledge and clinical skills were seen as important to help avoid confusion during birthing:
This training, if I did not get it ... I would not have helped them ... when I see legs [breech] or hands [transverse] coming first, I find the doctor or nurse—I was not taught this. (FGP 1: Urei)

I am confused about the legs coming out first—I was not taught on this and I take them to the hospital. (FGP 1: Ames)

Another FGP participant identified witnessing women being mismanaged by other TBAs practising without formal training. She stated:

I came late and when the mother delivered the baby, pain did not come, so ladies attending to her asked her to push, she kept pushing and the baby came out, but her Kapis [slang word for labia or vagina] was swollen. The nurse at the university did not mention I will face this situation ... I got the boys to make the stretcher and rush her to hospital ... I asked the nurse in the hospital and they said early pushing will cause that. (FGP 1: Akie)

Awareness of their knowledge limitations was also encountered by women in the second highlands focus group: ‘After we deliver the baby, we don’t check for anal opening, we sometimes forget or we don’t check them—this information was not taught. We keep the baby and baby dies’ (FGP 2: Josi). Participants emphasised that the nurses that came and taught them:

Did not tell us the cause of each infection, if pale ... it’s from this, if swollen legs ... from this disease. We are confuse[d] in case we catch this disease—sometimes scared to serve them. (FGP 2: Skola)

In case we go wrong and this confusion is there, nurses must come back and teach us clearly. (FGP 2: Wapa)
The participants identified concerns regarding not only their new knowledge, but also maintaining their knowledge. This subtheme related to the participants’ desire to reintroduce University A’s program:

*VBAs must recognise [illness] and save [people]. AIDS is around, TB [tuberculosis] is increasing—[we] must recognise the signs. Training must come back, come and teach us more clearly, and tell us how to protect ourselves—we might catch the disease if not aware.* (FGP 2: Skola)

The coastal FGP participants admitted to being taught specific skills and procedures, but stated that they had not received demonstrations of certain skills, such as examining an antenatal woman. Instead, many coastal participants identified learning through self-experience:

*the student* ... taught me everything about how to work with mothers, but did not take and show me how to check and palpate a mother who was pregnant to see how the baby was sleeping in the belly [uterus], even though there were pregnant women available ... she just showed me what to prepare for childbirth. (FGP 3: Zabeth)

Yes, the students taught us everything on how to check antenatal women ... [but] they did not show us how to check a woman who was pregnant when they took us to [a] health centre ... I laid down and checked myself when I was 38 weeks pregnant. (FGP 3: Feino)

*the student* taught me everything about how to check antenatal mother in my community ... [but] I did not check anyone in my community ... I also checked myself and I experience the way to deliver the baby on myself—no one helped me and I nursed myself in my house ... I then nursed and delivered a 15-year-old in my house who did not go for clinic. (FGP 3: Amune)
In discussing the new knowledge University A’s training brought the VBAs and VCHWs, the coastal participants identified that they were taught comprehensively about caring for pregnant women and their children, but felt that they still lacked skills in performing this care. For example, the participants had not undertaken a return-demonstration on examining pregnant women; rather, they had conducted self-examination. After the training, the participants in the highlands focus group encountered many new experiences that they had not explored during their training, and stated that they had to learn through experience or by referring mothers to people who were qualified to handle such situations.

The VBA and VCHW focus group participants were adult learners from different educational backgrounds they strongly felt that they had learnt differently from graduate nurses. To educate semi-skilled workers learning from demonstrations is considered a ‘promising solution’ (Chernova & Veloso, 2007). However, a barrier can develop if theoretical and clinical information is lacking when there is an opportunity for learning (Russell, 2006). The focus group participants expressed their interest in learning; however, when the clinical educational component was omitted, it led to confusion.

6.3.9 Promoting growth and protection for health outcomes.

PNG has diverse land and sea resources, with the population able to own land on which to grow and harvest food for their daily intake. While a variety of food from the land and sea is available in PNG (see Chapter 1), there remains a risk of people having access to certain nutritional sources, while lacking others. For example, a variety of fresh vegetables are grown in the highlands of PNG, but not the coastal areas, while a variety of carbohydrates are found in the coastal areas, but not the highlands. When the opportunity for a balanced diet is lacking, malnutrition becomes a risk factor
contributing to poor health, impaired cognitive development and low education achievement (Wand, Lote, Semos & Siba, 2012). Participants in various focus groups identified that the health promotion messages—such as eating a balanced diet, safely preparing food, the importance of seeking timely and regular antenatal and postnatal healthcare, and the need to immunise babies—were received and imparted to mothers, children and the village population in the communities. The VBAs and VCHWs recognised the importance of pregnant women, mothers and infants eating well, growing and being educated, and the importance of immunisation—referred to colloquially as a ‘banis’ or ‘fence’ (Dina) for the body to protect against illness.

The newly acquired knowledge about nutrition and healthy eating habits was imparted to the pregnant women:

*One thing we learnt is that a woman who is pregnant must eat three times a day [and] she must rest so that she can have good baby. We learnt this and it has helped us to do more.* (FGP 1: Orua)

*We talk to pregnant women on eating good food [fruits, vegetables and protein] to help her and her baby’s body, rest plenty, walk around and exercise for giving birth. Child will grow well and be educated. If not eating well, they get sick, many die from malnutrition or lost weight from not eating good food ... we also tell mothers to wash their hands, clean and wash themselves before cooking the food for their children ... we tell them, if you give [food] with dirty hands, they will have diarrhoea.* (FGP 1: Lina)

*we weigh the children—if green line [above 80% of the normal standardised weight for dates], we know they are okay. If below, we refer to hospital or [give] advice on nutritional diet. We also tell them [to] give baby mixed food [food
from all food groups] and [must] be eating by everyone in the family. (FGP 1: Dina)

Advice on immunising babies was also considered important:

Parents [are] not concern[ed] if child immunised or not—we talk to them on importance of immunisation, immunisation is protection [banis] for baby, so we check the clinic book for due date and refer. We advise fathers to support mothers to eat properly and give good breast milk to baby for the baby to grow properly and healthy. We advise fathers to support mothers [to] take baby for immunisation. Immunisation is banis [protection] for disease. (FGP 1: Dina)

Health educational advice and information on immunisations and healthy eating habits were recognised for its importance by the participants in the first highlands focus groups not the others. One member of the coastal focus group stated: ‘We move around and check the children who did not get bebi sut [immunisation]. I tell the mother to take her baby to hospital for immunisations’ (FGP 3: Feino). The assumption here was that weighing children and education on immunisation and nutrition were in response to the first highlands group participants being taught by the BCMCH students on how to read of an immunisation chart, and weigh and plot weight chart. This information was not identified in interview data from the second highlands focus group or coastal focus group. The focus group participants in these latter two groups recognised the importance of nutrition and immunisation, and stressed the need to recognise different diseases in each age group, as well as the ‘too sick’ signs for early referral discussed earlier in this chapter. In 2012 in PNG, the general coverage for childhood immunisation was 64% (Wand et al., 2012), although these data may be limited in interpretation due to issues with collection. PNG recently experienced an outbreak of
measles, as reported in PNG Health News in 2013, with many children still not fully immunised.

While under-nutrition has been a global underlying cause of child mortality, WHO (2010) data demonstrated a decline from 12.4 million cases of malnutrition in 1990 to 8.8 million in 2008. However, this decline has not been demonstrated in PNG, where UNICEF data show no decline in under-nutrition since 1980 (Wald et al., 2012), although the interagency group (UNICEF, WHO, World Bank and United Nations) estimated a slight reduction from 52/1,000 in 2009 to 48/1,000 in 2012 (The World Bank Group, 2015).

In 2005, with the introduction of the WHO-initiated IMCI program, the focus was on improving the management skills of child health workers to promote the growth and development of children to reduce child mortality. The VBAs and VCHWs who received knowledge and clinical skills from University A’s program nurses were subsequently able to educate women in the community on the importance of good nutrition for growth and immunisation.

6.4 Conclusion

The VBAs and VCHWs all identified that University A’s BCMCH program had provided educational to the three focus groups, with participants gaining new knowledge that they were able to use to save the lives of mothers and babies. They also discussed their knowledge limitations and desire to help others learn from their experiences. They generally agreed about the value of University A’s training; however, this was experienced at different levels. The participants from one highlands focus group identified that they had received health information for the first time, which caused changes to their way of living. In the second highlands focus group, the ability for remote and rural women to receive timely health services was hindered by distance;
access to transport; and access government services, such as health and education. This focus group noted considerably more difficulty accessing health services than did the other highlands and coastal focus group participants, who lived in the vicinity of necessary services, especially roads and transport.

The need to continue the maternal and child health program with assistance from the government was testified to by all focus group participants. University A’s program students were seen to ‘go the extra mile’ in implementing self-help projects, such as road building in the second highlands focus group community. The VBAs and VCHWs appreciated the training and subsequent changes that occurred in their communities, but recognised the importance of having sustainable training and projects before moving into other communities. The training also contributed to the VBAs and VCHWs being recognised and trusted by communities, families and health sectors, and added status to their role. Also of importance was knowledge acquisition on HIV and STI transmission, prevention, counselling and testing, which cleared misconceptions and generated eagerness among villagers to attend testing and counselling. The participants’ testimonies suggested the importance of training VBAs and VCHWs who were willing and capable of learning skills in perinatal prevention, early recognition and management.

In summary, these focus group data suggested that University A’s program offered from 2005 to 2009 enabled VBAs and VCHWs to help reduce mortality in their communities (in highlands and coastal regions), with many participants witnessing reduced maternal and neonatal deaths in their practice. This is significant as one of the KRAs for the PNG National Department of Health in fulfilling MDGs 4 and 5.³

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³ Emic – gathering views from birthing women from different cultures, customary practice, language and geographical locations regarding care and support from VBA’s attending to them
Chapter 7: Postnatal Women’s Perceptions of VBAs and VCHWs in PNG

7.1 Introduction

The final phase of this four-phase study examined postnatal women’s testimonies of the care and assistance provided to them by VBAs and VCHWs, as direct recipients of their care during pregnancy and childbirth. Of note here are the testimonies mentioning VBA as caregivers, although the same person was often simultaneously called a VCHW. Globally, 62% of women still give birth with limited support from health workers or skilled birth attendants (midwives), with few still seeking assistance from women in villages (UNICEF, 2009). In PNG, many women still deliver alone or with assistance from female family members and/or VBAs in their villages, with over half of women (53%) attended by midwives and nurses (WHO, 2011). Geographical location, distance and transport have been cited as major obstacles to women seeking professional healthcare in many parts of the world, including PNG.

A more emic view from the perspective of the birthing women as recipient of University A’s BCMCH-trained VBA lead care needs to be identified in order to better target appropriate care that aligns with the availability and skill level of the health workforce. This chapter reports this study’s face-to-face interviews with 10 postnatal women also living in the highlands and coastal regions where the previously interviewed VBAs and VCHWs were based. In particular, this discussion highlights the women’s health-seeking behaviours, perceived health risks and health perceptions, as recipients of healthcare provided during pregnancy and childbirth.

7.1.1 Demographic data.

Face-to-face interviews were conducted with 10 postnatal women, who were recruited via snowballing sampling in the highlands and coastal regions of PNG. Of the
10 women who were purposively sampled and approached, all agreed to be interviewed. These postnatal women were aged between 18 and 36 years, with eight of them married, one unmarried and one separated from her husband. Among the participants, nine had some form of education (Grade 6 to 10) and one woman had no formal education (illiterate). All women had between one to six children, with at least one delivered by the VBA. Eight women reported having attended antenatal clinics, while two admitted to not attending any antenatal care. Nine reported having no complications during pregnancy, while one stated that she had swollen feet during pregnancy and heavy bleeding during childbirth.

7.1.2 Emerging themes.

The face-to-face interviews were conducted in PNG’s national language, Pidgin or ‘Tok Pisin’. The interviews were then translated into English by the researcher and transcribed, prior to coding, reading, rereading and thematic analysis. Nine main themes and 12 associated subthemes emerged from the data, as presented in Table 7.1. These themes and subthemes informed the subsequent discussion.

Table 7.1 Emerging Themes from Postnatal Data

<table>
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<tr>
<th>Themes</th>
<th>Subthemes</th>
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<td>Being ‘well’ or ‘alright’ are reasons for home birth</td>
<td>‘I am alright, I am not sick’</td>
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<td></td>
<td>Pain in the night, no car, no bus fare</td>
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<tr>
<td>Following instructions for good health outcomes for ‘me and my baby’</td>
<td>‘I did what I was told’</td>
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<tr>
<td></td>
<td>‘She did not visit and talk to me’</td>
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<tr>
<td>Antenatal checked and preparing for childbirth</td>
<td>Hand gloves and belly button clamp</td>
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<tr>
<td>I pushed the baby and she helped me</td>
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<td>Family support during pregnancy and childbirth</td>
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<td>‘Bebi sut’ (baby injection) for protection and health</td>
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<tr>
<td>Recognising the importance of VBAs’ job</td>
<td>VBAs doing their jobs well</td>
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This chapter explores the themes identified, and relates them to the specific primary research questions—the focus of which was to examine the perceptions of postnatal highlands and coastal women on the role of University A’s BCMCH-trained VBAs in the delivery of maternal and child health services. Pseudonyms are used in the reported testimonies to de-identify the participants in accordance with RMIT University’s CHEAN and PNGMRAC’s ethical requirements.

### 7.2 Being ‘Well’ or ‘Alright’ are Reasons for Home Birth

Commonly, when giving birth, women in PNG communities assume that everything will go well during birth. Historically, going to hospital was seen as only necessary for people with a physical ailment, termed ‘being sick’. When asked about delivering babies in villages, postnatal mothers commented that they were ‘alright’ and did not foresee any problems occurring:

*I was alright and I delivered in the village ... I delivered my baby at 6.00 pm ... I was feeling well and I know I would deliver well. I did not have any problem when I delivered the baby, and I delivered the baby well.* (Misakau, aged 25, two children)

Even women having their first baby thought ‘being alright’ meant they could deliver their babies in the village, despite documented obstetric risk:

*I did not go to the hospital when I was pregnant, I was alright, I did not go to the hospital and drink any medicine ... the baby’s eyes were opened and baby was moving and we stayed ... I got the baby in the morning ... I was happy to*
have the baby ... I was not sick ... I was okay. I stayed and the baby was born and I am now staying [in the village]. (Sindawo, aged 19, one child)

I did not go for clinic because I did not want to go and ... I got my baby in the village ... the VBA mother helped me, so I delivered in the village. (Antonia, aged 18, one child)

Another common reason stated by the postnatal women for delivering their babies in the village was the timing of their labours, expressed as ‘pain in the night’.

Other reasons given by the postnatal women included ‘no car and no bus fare’:

I felt [labour] pain in the middle of the night. My mummy and daddy went looking for car and did not find any. I know my mother was here and doing the job of helping women. I told my mother [VBA was the mother] and she helped me. (Jolina, aged 30, six children).

I felt [labour] pain in the morning and, by the time they brought the transport, the water [membranes] broke, and mummy VBA was informed and she came [and] delivered me in my house. (Anita, aged 25, two children)

It was in the night and there was no car, so I did not go to the hospital ... I usually deliver fast when I have little pains ... I was having pains and, living inland, there was no car—my husband quickly went and got the VBA and she delivered the baby. (Nina, aged 36, six children)

Giving birth in the village and community setting is a historic customary practice in PNG, despite widespread public health campaigns and professional healthcare advice on the importance of giving birth in a formal health facility. Many low-income countries reported that women giving birth without the support of a skilled birth attendant or midwife is not isolated to PNG (WHO, 2012). However, in PNG, it was recently documented that only one-third of women attend antenatal clinics, despite
living in the vicinity of roads and transport systems. Barriers commonly cited include inaccessibility, cost (Andrew et al., 2014), distance, rough and mountainous terrain, and inadequate transportation to evacuate women in labour to a health facility (Vallely et al., 2013). These findings were further confirmed in the current study, with the substantial theme of women not attending a health facility for childbirth because they were ‘alright’ and ‘not sick’. This protective belief about ‘being alright’, as well as transportation and geographical barriers to formal healthcare, must be considered when up-skilling community or village-based healthcare providers to ensure effective health service delivery.

In PNG, as elsewhere, ‘being well’ during pregnancy does not guarantee that giving birth at home will lead to good maternal and newborn health outcomes. Attendance at routine antenatal care with positive indicators can predict better birthing outcomes. For women giving birth in remote rural settings, where most unrecorded maternal deaths occur, it is recommended that appropriate health education be provided to enable women to understand the importance of undertaking childbirth in a hospital in order to accommodate unpredictable circumstances.

### 7.3 Following Instructions for Good Health Outcomes for ‘Me and My Baby’

Customarily in PNG, there has been no formal health education in the community on the self-care needed during pregnancy and childbirth. Commonly, older women, mothers or mothers-in-law provide cultural and familial advice on pregnancy and childbirth. PNG’s current national health initiatives that address MDG 4 are intended to improve child survival rates, while MGD 5 is intended to improve maternal health by providing educational information by the nurses. This information includes discussing the frequency of attendance at antenatal clinics, and promote at least four
visits prior to childbirth (WHO, 2015a). However, the testimonies of the participants in this study suggested that these initiatives to promote attendance at antenatal clinics did not reach or were not taken up by women in the more rural and remote areas of PNG. For example, when the postnatal women were asked to describe the advice they received regarding preparation prior to childbirth, the following comments were made:

*When the baby was in the stomach, they [VBA] said I must not sit a lot, I must walk around and do light work, do not carry heavy load and the baby can move and come quickly. For the baby, she said before I have the baby, I must find baby’s clothes and prepare, prepare my modess [sanitary Pad].* (Dalina, aged 30, three children)

*I was told to wash all the time, change pants, not to smoke and chew betel nut or sit too much, must walk around, not sleep too much and eat good food for baby to grow. For the baby, they said I must wash the baby morning and afternoon, don’t take him out in the cold [or] the baby will be sick.* (Jolina, aged 30, six children)

*[The VBA said] you must not work a lot, must rest and have plenty greens … If you feel sick, go to hospital. I follow what she said … For the baby, you must take care, don’t expose to cold, must cover the baby and put in the baby billum [string bag], wash baby and baby’s clothes.* (Nina, aged 36, six children)

*They [VBA] told me to eat good clean food, wash all the time, eat lots of greens and rest well … For my baby, I must wash the baby, put his nappies on, change the baby all the time, wash the baby with clean warm water so they won’t get scabies or other diseases … wash hands after going to toilet and eat food with clean hands … For the baby, I must take the baby for bebi sut [immunisation], as I delivered in the village.* (Emika, aged 23, one child)
Other postnatal mothers attended antenatal clinics and received health advice, but received no visits from the VBA in the village, or any advice from antenatal clinics through to delivery of their babies:

*Here [village] they [VBA] did not come and visit me or say how I was to live and to have the baby, like they did at the health centre ... I had swollen feet when time for giving birth and I got the baby ... she [VBA] did not visit and give me advice on swollen foot.* (Sindowa, aged 19, one child)

*I went back and forth to the clinic and they checked and told me how the baby was sleeping and gave medicine for blood to make us strong. In the village, they [VBA] did not talk to me or checked me—she took me to the hospital and they checked me.* (Anita, aged 25, two children)

The literature on low-resource countries contends that women delivering babies in villages, combined with their lack of attendance at antenatal clinics, poses the significant risks of inadequate preparation for childbirth, unidentified hidden health problems (such as HIV infection, anaemia or hypertension) and lack of support from a skilled attendant during childbirth (WHO, 2015a). However, in this study, the women testified to receiving advice on healthy diets, good hygiene and exercise from VBAs who attended to them during pregnancy and childbirth—an indication of knowledge transfer at the community level. The PPE training was taken to the next level where the three cleans were taken into consideration in the aspect of daily life. This shows that learning was not only applied to the birthing situation but rather the whole community.

In PNG, pregnant women in rural communities continue with daily chores, with pregnancy framed as a normal event. Decisions regarding healthcare are commonly made based on advice from powerful family members or health personnel in the community. During pregnancy, women in rural areas commonly make one or no visits
to a formal health facility, and then either arrive for delivery of their babies at the health setting without making a booking, or turn to VBAs for assistance. Postnatal mothers who did not receive advice from clinics or have VBAs attend their deliveries encountered problems, as noted in these participants’ testimonies.

7.4 Antenatal Checking and Preparing for Childbirth

The formal advice received on preparing for childbirth was generally minimal and depended on the availability of resources—a particular problem in resource-poor settings, such as PNG, where most women live on subsistence farms. The mothers testified to preparing the basic equipment needed for hospitalisation. In PNG, antenatal mothers attending antenatal clinics are often told what to prepare and take to hospital, while women not attending clinics and delivering in villages often miss this information. The postnatal women in these interviews testified to the VBAs examining them and advising what to prepare prior to delivery of their babies, whether in the village or health facility, if they were able to get there for childbirth:

She [VBA] asked me if I was alright and if I feel the baby moving. I told her I was alright ... She checked me and said baby was sleeping alright. She told me to prepare nappies, blanket, shirt, baby pants ... they [VBA] brought pot of water, after I delivered they heated it up and washed me. (Emika, aged 23, one child)

She [VBA] took me to her house and checked me [points to the side of her abdomen] and said baby was sleeping on the side and the head was not down. She turned the baby and he was sleeping on the side ... She fixed the baby and put the baby to sleep in it right place on the side ... the baby was not sleeping straight, she did that and the head of the baby came down. (Apowena, aged 32, four children)
While a couple of the postnatal women testified to preparing what they had on hand for giving birth others had undertaken more extensive preparation prior to delivery of their baby:

Before I delivered, I prepared modess [sanitary pad], belly button [umbilical cord clamp], nappies, blankets and towel. For the baby, they said, prepare the clothes for baby. Baby must cover with good blanket and wear good clothes where they will feel warm and grow properly. (Anita, aged 25, two children)

When you are five months, go for clinic. When five months, she took me for clinic—I attended the clinic and delivered baby boy in the village. She told me to buy belly button [umbilical cord clamp], baby clinic book, baby clothes ... I listen and bought everything. (Apowena, aged 32, four children)

Preparations for teenagers delivering their first babies were a notable omission from the VBA training. The two teenagers in the focus group interviews did not attend an antenatal clinic, which could be attributed to the shame and stigma of teenage pregnancy. It is possible that they received advice for preparation from family members, such as their mother or aunt, as they admitted not being told by the VBA how to look after themselves or how to prepare:

I was not told how to look after myself ... [but I was told to] ... prepare plastic pants, nappies, baby oil, powder and, for myself, clothes and the things I would use. (Antonia, aged 18, one child)

I did not prepare the place to sleep ... I just sat and had my baby ... in the house we made and no one living in it ... she got the blanket and things ready ... got the baby, covered the baby and gave me. (Sindowa, aged 19, one child)

Aside from the teenagers, the adult village women routinely testified to the VBAs telling them what to prepare for delivery of their baby—in particular, they were
instructed on high-risk factors and what signs to watch for, such as bleeding while still pregnant, signs of decreased or absent foetal movement, headaches and dizziness. They were also informed of the importance of seeking early healthcare. In the formal antenatal clinic setting, information on family planning, hygiene and nutrition was routinely among the key advice given prior to conducting antenatal examination, investigation and treatment.

The antenatal women were expected to prepare to go to the hospital by bringing certain items, such as sanitary pads, umbilical cord clamps, and clothes for the mother and baby. The mother was also required to purchase the clinical record books for her baby; however, this was found to be a significant financial barrier to women having hospital births, and often justified the decision to persist with village birth (Vallely et al., 2013). User fees or access-to-service fees are imposed by a large number of facilities in PNG, with the exception of child and maternal health services—although some health services still charge a minimum amount to access these. A study on the barriers to women using PNG’s health service found that 21% of postnatal women stated that user fees were a barrier to accessing care, in addition to psychosocial, cultural and social factors, and women’s personal experience (Andrew et al., 2014; Vallely et al., 2013). As a result, many women seek assistance from other women in their villages, which is free of charge.

7.5 ‘I Pushed the Baby and She Helped Me’

In PNG, many women who deliver in a formal hospital setting are required to follow certain procedures, such as lying on their back when giving birth, and all necessary equipment is prepared prior to delivery of the baby. This is in contrast to delivering in a village setting, where women are given little attention and only view
VBAs as providing assistance during ‘catching and cleaning’ the baby. The remainder of maternal and child healthcare is provided by the postnatal mother, her mother and the immediate family. Postnatal women delivering in villages gave accounts of the VBA, of self-preparation and of techniques used to assist them as they gave birth:

She [VBA] made bed with canvas [piece of plastic], a clean place, and she got the baby on top of that and gave me. The baby did not have any problems... she got [delivered] the baby well and gave me. (Dalina, aged 30, three children)

I felt that I was going to have the baby ... she fixed the bed quickly, got the hand gloves and she was watching with her hands ready to catch the baby ... I pushed the baby, the baby came and she got the baby and gave me ... I delivered the baby’s billum [placenta] well, nothing broke ... I did not have any problems. (Apowena, aged 32, four children)

She told me to walk around so that baby’s water can break and make it easy for me to have my baby ... she prepare the place with the things I gave her, like canvas, nappies, blanket [and] modess [sanitary pad]. Baby’s water broke and she delivered me in the duck house ... she rub my bel [abdomen], remove baby’s billum [placenta], rub the abdomen and remove waste blood, cleaned me and gave me baby to breastfeed. (Jolina, aged 30, six children)

She [VBA] prepared the room, broomed and clean[ed] and the place, got the birthing kit, clean plastic, spread it and put pillow for me to lie down, she got the clean hand glove, clean razor blade and clean nappies to clean the baby ... she was sitting below my legs and watch as I pushed. (Nina, aged 36, six children)

Globally, it is estimated that around one million women and newborns die of infections after childbirth (Blencowe et al., 2010). The WHO (2011) human right to
health mandates that safe birth is the right of every woman, regardless of the context. While this has not been achieved in the resource-poor setting of PNG, considerable progress has been made to promote the ‘three cleans’: 

- a clean surface for the mother to lie during childbirth  
- clean equipment, such as razor for cutting the umbilical cord  
- soap and water to wash hands, and for the mother to wash before and after giving birth.

This preparation and application is done to prevent infection and promote safe birth outcomes (Blencowe et al., 2010). In PNG, puerperal sepsis and neonatal infections are among the most common causes of postnatal infections and deaths (Sanga et al., 2010; WHO, 2011). The recent adaptation of the ‘three cleans’ by VBAs during preparation for childbirth reflect resource-appropriate application of birthing knowledge for women in remote rural communities, who are unable to receive safe institutional birth.

### 7.6 Family Support during Pregnancy and Childbirth

Support during childbirth in PNG is usually received from women in the family, with husbands not commonly involved. Encouraging men to support their wives during pregnancy and childbirth is an approach currently applied by most health facilities during antenatal education in PNG to promote improved women’s health (Somerville, 2013). Regarding the family support received during pregnancy and childbirth, the participants stated that women and family members were very supportive:

*Family spoke words [magical words] in the [cup of] water and gave me. I felt pain and delivered in the night ... my husband look for vehicle and did not find [one], so I told my husband that mama VBA was there ... I can go and she can help me.* (Apowena, aged 32, four children)
My mother is VBA and she does this job helping others, so my mother delivered the baby. She watched over me till morning and asked me to go wash in the river. I had small tear so she told me to boil water, put salt and clean the area, and it dried up. (Jolina, aged 30, six children)

Although VBAs were not always close relatives of the postnatal women, they were appreciated for caring for the women as though they were family members. Culturally in PNG, there are extensive, extended family systems. Having strong family ties has many benefits, such as helping with financial support following deaths (most commonly occurring from tribal fights or motor vehicle accidents), paying a bride price for marriages, caring for family members after death or separation, and supporting finances for education and health (Hinton & Earnest, 2010). Closer care was seen to constitute part of the extended family system, in which care and support are offered:

[The VBA] did good things to me ... fill my water ... baby born ... warmed water and washed me ... rub my stomach and remove blood from me ... she made big fire for me to warm my skin ... went to the garden, then came back, cook food and gave me to eat ... she told my husband to find food, cook and give me to eat. (Misakau, aged 35, two children)

However, pregnant teenagers were an exception to the expectation of support from the strong kinship network. These teenagers disengaged from the network and consequently did not receive close VBA support. They stated that they hesitated to seek help at the clinic and depended solely on their mothers for support and care:

I did not have any problem and she [VBA] did not help me. I delivered alright [and] she [VBA] did not give me any advice ... mummy helped me to have the baby and is helping me [with] taking care of the baby. (Antonia, aged 18, one child)
Assistance and support given to postnatal women by family members, including husbands, are important for the wellbeing of the mother and baby. However, while family support is given to pregnant women in properly recognised marriages, pregnant teenagers often deliver in isolation, with only their mother and immediate family as support. Past studies have found that many teenagers feel ashamed and are fearful of attending clinics, even during their first pregnancy, because they have heard myths of mistreatment from health workers (Ali, 2006; Butt & Munro, 2007; Vallely et al., 2013). In PNG, it has been reported that 50/1,000 births occur among teenagers aged between 15 and 19 years. These births are often greeted with stigma and discrimination in Pacific Island countries, such as Vanuatu, Marshall Island, the Solomon Islands and PNG (UNFPA, 2011).

7.7 ‘Bebi Sut’ for Protection and Health

Antenatal clinics in healthcare facilities and mobile clinic visits to communities educate women on the importance of taking their children to the hospital for growth assessment; weight, height and head circumference checks; and immunisation. As aforementioned, in PNG, infant and child mortality is high as a result of preventable diseases and conditions. Postnatal women in the current study testified to being advised by University A’s BCMCH-trained VBAs on the importance of caring for their babies, keeping them warm and having them immunised:

After you deliver the baby, you must take care, don’t expose to cold, you must cover all the time, you must wash the baby, cloth and put into the billum, or take baby into the room and keep the baby there. (Nina, aged 36, six children)

You must feed the baby with good food so that baby will grow strong ... take the baby for bebi sut [immunisation] ... the bebi sut is banis [a ‘fence’ or
protection] for the baby—it will protect him to be healthy ... I took the baby back and forth to clinic for bebi sut. (Emika, aged 23, one child)

They told me to wash the baby, look after the baby, wear good clothes that will keep the baby warm and give good food. They said, ‘Don’t take the baby out into the cold, and take the baby for bebi sut’. (Apowena, aged 32, four children)

She told me to take baby to clinic for the nurse to check ... VBA did not go with me, I went myself, and baby got bebi sut at one and two months. (Anita, aged 25, two children)

The 2015 vision for PNG is to have Papua New Guineans who are ‘wise, smart, fair and healthy’ (Government of PNG, 2010a). This vision aims to grow a generation who are physically, mentally, socially and spiritually healthy. To encourage the younger generation to engage with health promotion and health education, the first step is to focus on healthy children and young adults. The vision cannot be implemented when children are dying at an early age from preventable infections and diseases. Currently, infant mortality in PNG stands at 47/1,000 live births (WHO, 2012).

Mass immunisations of children at an early age protect them from developing preventable diseases. In PNG, the 2008 to 2012 immunisation figures showed that around 60 to 84% of children were immunised—this indicates that more than 20% were either not reported or had not been immunised (UNICEF, 2013). The postnatal women in this study who received information and had high literacy understood the importance of immunising their children, while others decided not to immunise their children, despite receiving this information. They reported that their children were healthy and did not need any healthcare: ‘I delivered and I am alright ... She [VBA] did not give any advice to me ... I did not take my baby for bebi sut. We have never been to the hospital’ (Misakau, aged 35, two children).
Popular PNG colloquial saying of ‘alright or healthy’ suggests that all will be alright and a sense of fatalism associated with a lack of taking responsibility for healthcare. This places many mothers and children at risk of preventable infections, diseases and deaths; therefore, education is dispel belief that everything around birth will always be ‘alright and healthy’ therefore health education interventions must be provided in both urban and rural settings in PNG.

7.8 Recognising the Importance of VBAs’ Job

The perceptions of the rural and remote villagers indicated that little is known about VBAs’ training and job unless the community has had considerable prior exposure to VBA work. However, the postnatal women provided testimonies on how the University A-trained VBAs had assisted during particularly difficult circumstances, and especially for decision making when seeking healthcare. These postnatal women stated that the University A-trained VBAs were very helpful and did their jobs well:

*It [was] very good and great help ... to find a car is very difficult to go to hospital ... if you have money, you will go there ... when VBA do this job, they make it easy for us mothers in the village ... when they have money, they help us.* (Jolina, aged 30, six children)

*It’s really good, they [VBA] are our help, especially we mothers ... we travel long distance to hospital to give birth, but now, with VBA mothers here, we feel they are our help.* (Emika, aged 23, one child)

*It [is] really good—they are doing their job well with women who are pregnant ... [when] we mothers have need, we come and see them ... they used to help us and to have our babies ... they help those of us whom our husbands have left ... come and talk to us if we have problems.* (Anita, aged 25, two children)
The postnatal women also gave evidence of VBAs helping provide safe delivery and prevent maternal mortality:

_"I did not have any problems, like losing a lot of blood or broken skin [perineal tear]. She did well and delivered well ... this work they are doing is good ... it is helping a lot of mothers ... VBA mothers are fit to do the work ... they are helping us a lot and we are happy with this work you [the university] brought for us."_ (Dalina, aged 30, three children)

_"We are happy for VBA with this job ... before, when no VBAs train, many mothers were dying, facing problems and many babies were dying. I see the work of VBA in our area and experience it myself is very good ... when trying to rush the mother to hospital and no transport, mothers were dying. [However] from 2008 to 2013 ... [the] program [is] slowing down—we have babies and they are not taking care of us."_ (Nina, aged 36, six children)

The role of TBAs has been extensively examined in previous studies of their effect on reducing maternal and infant mortality in low-income countries, such as Pakistan, India, Africa and parts of the Pacific (MacArthur, 2009; Oshonwoh, Nwakwuo & Ekiyor, 2014; Shaikh, Khan, Maab & Amjad, 2014). In PNG, recognising the importance of the role of VBAs in the community is vital to meeting MDGs 4 and 5, where skilled care attendants during childbirth is low compared to many high-resource countries. The postnatal women interviewed as the recipients of VBA and VCHW care acknowledged and appreciated their assistance and accessibility during childbirth.

The Declaration of Alma-Ata in 1978 promoting ‘accessibility, affordability, acceptability and full participation’ (WHO, n.d.) in providing access to basic health involved national governments around the world, especially in low-resource countries, such as PNG (Hall & Taylor, 2003). Among its aims were ‘goals on access to health
care personnel in pregnancy and childbirth and child care at least up to one year’ (Hall & Taylor, 2003, pp. 17–20). The World Health Organisation (2014b) further supported these goals reported by the State of the Worlds Midwifery 2014 in that, in order to have effective health coverage in maternal and child health, the key components of ‘availability, accessibility, acceptability and quality’ are essential (WHO, 2014b).

Among the many postnatal women who used the service provided by the VBA, the ten postnatal women in this study recognised the importance of VBAs’ job in assisting them during pregnancy and childbirth, thereby enabling maternal healthcare to be accessible, acceptable and affordable. However, they did acknowledge that the quality of VBA care might not be comparable to that received in a formal health setting. Overall, these postnatal women stated that the University A-trained VBAs were ‘doing their jobs well’, and requested more community support to help VBAs in the community.

7.9 Community to Work in Partnership with VBA

VBA and VCHW volunteers have their daily village work in subsistence farming as well as the additional unpaid work of health volunteering posing considerable additional pressure. Postnatal women noted the difficulties faced by VBAs as unpaid volunteers, who were taking care of their own families and other people, such as women during pregnancy and childbirth, as well as addressing other community needs. The main need identified by postnatal women was for community support in building a common birthing house, where mothers could deliver in the village during an emergency. PNG women previously had separate houses built for women to use during childbirth and menstruation because, customarily, blood from child birth and menstruation was considered unclean, and menstruating women were not allowed to
enter or live in the common family home. However, these separate houses no longer
exist. Thus, the postnatal women called for the community’s support to build a house
where VBAs can attend to women during childbirth:

Community can gather and build a house—when mother has pain, they can go
and have baby there. Not good for them [VBA] to deliver mothers outside, where
it is dirty. (Dalina, aged 30, three children)

Community must work together to support their work—they must build a house
for sick people, they must bring food for them, support mothers and work in
partnership with them. (Emika, aged 23, one child)

this work is good [but the] community don’t really support [it] ... we mamas
[mothers] thought that government will provide support for the VBAs and build
community health house. In the night, when mothers having pain, they deliver
anywhere—near the river, in the bushes. We don’t know if baby will be sick or
not. To have a house in the community will be good. (Apowena, aged 32, four
children)

Another request for support identified by the postnatal women was for VBAs to
be given wages, travel allowances and medical equipment to perform their duties:

Some VBAs don’t have [a] husband [so the] community can help make their
garden, harvest food, ... bring building material and build house for them and
help with money or soap to support them [to] do the job. It would be good if they
can build house for the VBAs ... many mothers when having pain and when
escorting to hospital deliver in the bushes, coffee garden, under the trees ... or,
myself, I gave birth in the duck house. (Jolina, aged 30, six children)
Other participants noted the benefit of the jobs performed by the VBAs, and called for enhanced community support for them to help others who are not receiving the same level of assistance:

*Community must support them [VBAs] and send them out to other communities outside their own communities. Their job is good, so that they can move around and help others mothers who are pregnant to have their babies … or take them to hospital if they can’t help them.* (Anita, aged 25, two, children)

In PNG, VBA training programs were conducted as early as 1980 by different faith-based organisations; however, they were not sustainable due to funding issues (Bettiol et al., 2004). As the VBAs were trained as volunteers, they still serve as volunteers, with no form of support or payment from local, district or national governments. Although their roles are highly recognised by politicians and health department staff as being very important, no formal financial support is provided. Many of the rural women interviewed did not realise that the VBAs were volunteering and received no financial assistance from the government. They highlighted that government support was needed, given the importance of having VBAs in the community.

An older PNG-based study on the role of volunteerism in elementary educational program found that this was successful because communities were enthusiastic about building the teachers’ houses and classrooms to enable that progress (Siegel, 1997). External funding often leads to successful projects; however, when funding is not sustained, the lack of momentum is an additional barrier to successful implementation because key stakeholders do not take ownership of projects. Although the postnatal women in this study noted that the work of VBAs was good and they wanted more community support and financial sustainability:
Right now, VBAs are not receiving any support from community. The village councillors and community are keeping quiet and not supporting the VBAs. The [University A] program must come back [because], at the moment, our communities are not helping the VBAs and they are trying their best to do the work. (Nina, aged 36, six children)

Not only did the postnatal women call for community partnership with VBAs to benefit women in the community, but they also recognised the advantages of the training program to promote healthy homes for healthy living.

7.10 VBAs Promote Healthy Living Initiatives

The women in both coastal and highland regions in the vicinity of the villages that were involved in University A’s BCMCH program also participated in the ‘healthy homes’ program. The following statements indicate what they were advised to do as part of this initiative:

They [VBAs] told us to clean the place, plant flower, clean and build new toilets and have healthy homes ... they said, ‘You must built the road, build new toilets and use your toilet for waste ... do not use bush as your toilets’. (Emika, aged 23, one child)

In the past, hygiene was never part of the community ... they [VBA] taught us on hygiene ... we had flower gardens ... toilets ... dish racks, handwashing place and plenty women now on family planning when VBA is talking to them. (Nina, aged 36, six children)

Commonly, many villages have no toilets and rarely have flower gardens around their homes while the houses in the coastal areas were built off the ground, those in the highlands were built low on the ground to keep the house warm. Many people have
reports to use nearby bushes to dispose household and human waste, which led to digestive tract diseases from contamination (Horwood & Greenhill, 2012) as considerable public health problems.

WHO’s (1986) healthy homes initiatives (see chapter 4) were introduced to many PNG coastal and highlands communities in the hope of promoting healthy living. Many communities accepted and practised these initiatives to ensure healthy living. However, in the current study, while two postnatal women testified to actively participating in the healthy homes initiative, others did not.

Generally, the postnatal women in this study testified to receiving significant assistance from the VBAs, including information, help and support related to pregnancy and general health and wellbeing. They applauded the VBAs as being a great help to them and their communities.

7.11 Conclusion

Delivering babies in villages is a historical and contemporary practice in PNG, with 53% (World Bank, 2011) of births in 2010 attended by skilled health personnel (midwives and nurses) at health facilities (WHO, 2012). The women from rural and remote communities interviewed reported feeling ‘well or alright’ as a reason for not seeking medical attention for delivery of their babies. They also reported having difficulty navigating travel from distant geographical locations. These were the two main contributing factors leading to unassisted home birth. The women also identified having labour pains during the night and lacking transportation or a bus fare to attend a health facility.

They testified to receiving much-needed help during pregnancy and childbirth from VBAs. They recalled being educated on how to prepare themselves and their
babies for hospital or health facility birth, via the advice received from the VBAs or antenatal clinics they attended. However, the pregnant teenagers did not attend any health sessions due to embarrassment and shame. They stated that they were not told what to prepare for their baby’s birth, and did not attend any antenatal clinics. Failing to attend antenatal care facilities and not delivering in a formal health setting place many women at risk of missing vital information, and increase the risk of infection and death for both the mother and baby. While many women sought care in a health facility, others opted to continue seeking assistance from VBAs. This phase of the study indicated that not attending antenatal clinics or delivering in a health facility were common; however, the non-teenage village women seldom stated their reasons for not seeking skilled attendant care.

Equipping VBAs with birthing knowledge to support women in the community is vital in low-resource settings in order to provide timely care and assistance. While delivering in the village poses a number of health risks to mothers and infants, having semi-skilled health personnel present in the village improves the ability to provide safe maternal and child care, given that these personnel are often the first point of contact for healthcare in the community. While far from optimal, providing some level of minimal care through up-skilling VBAs exceeds having no or low-quality care.
8.1 Introduction

This chapter critiques the results attained from all four phases of the program evaluation in terms of answering the key research questions (see Chapter 3), with a primary focus on knowledge and skills transfer from the BCMCH curriculum (Chapter 4). The purpose of this chapter is to compare the dataset for convergence and divergence in the transfer of knowledge from the curriculum to the end recipients—the postnatal women—using a four-phase study in which each phase informed the next (Guion, Diehl & McDonald, 2011). Maternal and infant mortality remains one of the most significant health concerns for PNG, ranking at 250 deaths per 100,000 live births and an under-five mortality rate of 61 deaths per 1,000 live births, for a population of 7.2 million (WHO, 2013a). PNG’s key development indicators aim to improve specific MDGs, underpinned by social determinates (outlined in Chapter 2). This has resulted in government organisations and NGOs developing and implementing projects to target these concerns. In particular, University A’s BCMCH program conducted in 2005 to 2009, with support from AusAID and NZAID, undertook an extended targeted higher education program to improve the education and clinical skills of maternal and child health nurses, and transfer knowledge to VBAs and VCHWs to reduce the national maternal and infant disease indicators.

This study sought to address the following questions:

- What were the strengths of the previous educational module that was used to inform the training of the BCMCH students?
- What were the weaknesses of the previous educational module that was used to inform the training of the BCMCH students?
- What were the perceived strength in the transfer of knowledge and skills to VBAs and VCHWs?
- What were the perceived weaknesses in the transfer of knowledge and skills to VBAs and VCHWs?
- What were the perceptions of the postnatal women regarding VBA training?
- What were the convergent and divergent themes identified from the different phases of the study?

The study employed the following phases and associated methods of data collection:

- Phase 1: evaluation of University A’s BCMCH curriculum (Chapter 4)
- Phase 2: face-to-face interview with 20 University A BCMCH graduates who studied from 2005 to 2009 (Chapter 5)
- Phase 3: three focus group interviews with 20 VBAs and VCHWs (two highland and one coastal group), with each group consisting of six to seven participants trained by University A’s BCMCH students (Chapter 6)
- Phase 4: face-to-face interviews with 10 postnatal women purposively and snowball sampled from highlands and coastal regions, whose babies were delivered by University A’s BCMCH-trained VBAs (Chapter 7).

Thematic analyses were conducted on the last three phases, with themes and subthemes developed that formed the discussion in Chapters 4, 5, 6 and 7. This chapter expands on the triangulation of these themes, critiques the extent to which the research questions were addressed, and critically analyses the regional and international literature in consideration of the research questions. This chapter commences with a table of triangulated data from the three stakeholders phases, with clusters related to personal, professional and organisational level frameworks that consider personal/interpersonal
and organisational/professional impact (D’Amour, Ferrada-Videla, Rodriguez & Beaulieu, 2005) to address the research questions.

8.2 Main Themes from Data Triangulation of Phases 2, 3 and 4

The following table represents the main themes in each stakeholder phase in respect to Questions 1 to 4, regarding the facilitators of and barriers to educational knowledge and skills transfer. The triangulated data provided insights to the context with potential inadequacies found in one source minimised when multiple sources are confirmed and inconsistencies in the data are easily identified (Leech & Onwuegbuzie, 2007). In this study, when triangulated, the data offered multiple insights to the knowledge and clinical skills transfer that occurred in all stakeholder groups. Table 8.1 presents the data from all phases; Table 8.2 presents the convergence and divergent data, and Table 8.3 outline the gaps in the knowledge and clinical skills transfer.

Table 8.1

*Triangulated Data from Stakeholders Phase (2, 3, 4)*

<table>
<thead>
<tr>
<th>Changes</th>
<th>BCMCH graduates</th>
<th>VBA and VCHW</th>
<th>Postnatal women</th>
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<tbody>
<tr>
<td>Organisational</td>
<td>Community collaboration and partnership for implementing MDGs</td>
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<tr>
<td></td>
<td>• partnership to reduce MMR, infant mortality rate, HIV/AIDS</td>
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<td></td>
<td>• importance of VBA and VCHW training</td>
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<td>• promptness for referral</td>
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<td>Professionalism/career prospects</td>
<td>Trust and recognition for better birth outcomes</td>
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<td>• professionalism</td>
<td>• community trust and hospital recognition</td>
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<td>• career prospect limitation</td>
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<td>Professional Midwifery and child health knowledge acquisition sufficiency and appropriateness</td>
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<td>- adequacy (new approaches and concepts for training)</td>
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<td>- inadequacy (less knowledge and skills, working in different setting)</td>
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<td>- ‘bebi sut’ (immunisation) for protection and health</td>
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<th>Comparing past to present in ‘village mamas’ and papas’ perspective</th>
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<tr>
<td>- new knowledge, better practice</td>
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<th>Being ‘well’ or ‘alright are reasons for home birth</th>
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- men’s supportive role in maternal health
- ‘VBA did good to me, they are great help’

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<tr>
<th>Learning enhancement strategies for knowledge acquisition</th>
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</thead>
<tbody>
<tr>
<td>- learning through group work, case studies and presentation</td>
</tr>
<tr>
<td>- closeness and availability of staff</td>
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</tbody>
</table>

**Suggestions for clinical/community practice improvement**
- knowledge deficient (competency skills need improvement)
- skills deficient (little or no learning resources for skills)

**Limited knowledge and new encounters**
- new knowledge brings new problems
- learning through self-checking and self delivery

**Personal Transform practice through community experience**
- ‘back to the roots’
- influencing factors for changed practice (change agents)

**Comparing past to present in ‘village mamas’ and papas’ perspective’**
- clean living, not witchcraft and sorcery
- sharing paid knowledge
- ‘we could live like they did’

**Being ‘well’ or ‘alright’**
- ‘I am alright, I am not sick’
- pain in the night, no car, no bus fare

**Unplanned pregnancies and family planning**
- teenage pregnancy, trust and home birth
- family planning—‘new change’

**Unplanned pregnancies and family planning**
- teenage pregnancy, trust and home birth
- family planning—‘new change’

**Resources Evaluation tool for knowledge retention in resource-poor setting**
- health facility
- community

**Going the extra mile to reach the unreached**
- needing a ‘paddle’ to reach inland communities

**Limitation to knowledge acquisition**
- resources
- workforce

**Community to work in partnership with VBAs**
- community must support VBAs

### 8.2.1 Summary of Table 8.1.

The themes stated in the above table were saturated and were convergent when multiple stakeholder congruence suggested the perceived successful knowledge and clinical skill transfer. For example, ‘transformational practice through community experience’ was identified as affecting all stakeholders, both professionally and personally.
8.3 Thematic Convergence Indicating Knowledge and Skills Transfer

The convergent themes highlighted strengths in the transfer of knowledge and clinical skills, and its effect on stakeholders, as the recipients of University A’s program. The purpose of the evaluation was to examine the impact of the program in informing PNG’s maternal and child health morbidity and mortality indicators, in alignment with MDGs 4 and 5. This section first discusses the strengths of the delivery of University A’s program, categorised into organisational, professional and personal factors. It then proceeds to outline the weaknesses or divergences of the knowledge and clinical skills transfer. The following table guides this discussion of the perceived strengths and weakness of University A’s BCMCH for the BCMCH graduates, VBAs, VCHWs and postnatal women, and how these strengths and weaknesses were perceived to promote personal, professional and organisational change so that the targeted health outcomes could be achieved.

Table 8.2

Convergent Themes from Phases 2, 3 and 4

<table>
<thead>
<tr>
<th>Organisational</th>
<th>BCMCH graduates</th>
<th>VBAs and VCHWs</th>
<th>Postnatal women</th>
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</thead>
<tbody>
<tr>
<td>Professionalism/career prospects</td>
<td>Trust and recognition for better birth outcomes</td>
<td>Recognising the importance of the VBAs’ job output</td>
<td></td>
</tr>
<tr>
<td>• professionalism</td>
<td>• community trust and hospital recognition</td>
<td>• VBAs doing their job well</td>
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<tr>
<td>• career prospects</td>
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<tr>
<td>• career prospect limitations</td>
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<th>Recommendations for future program implementation</th>
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<th>Community to work in partnership with VBAs</th>
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<tr>
<td>• program inclusion and exclusion</td>
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<th>Maternal and child health skill acquisition and implementation</th>
<th>Saving babies’ lives by looking for ‘too sick’ signs</th>
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<td>• ‘Bebi Sut’ (immunisation) for protection and health</td>
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</tbody>
</table>
(community survey or application of case studies)

- maternal health (specialist midwifery procedures learnt and implemented)
- limitation to implementation (working in different settings)

- different age groups
- promoting growth and protection for health outcomes
- ‘grow well and be educated’
- immunisation as ‘fence’ or ‘banis’ for disease

- ‘taking care of my baby’s health’

<table>
<thead>
<tr>
<th>VBA/VCHW knowledge and skills transfer in rural communities</th>
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<th>Following instructions for good health outcomes for ‘me and my baby’</th>
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- Transform practice through community experience—‘back to the roots’
- awareness prompters (recognising the distance people travel and mode of travel to promote awareness and instil availability and promptness)

- Losing blood and saving lives: recognising the problems and their effect on women
- far distance, no transport
- understanding and knowing the reason for referral

<table>
<thead>
<tr>
<th>Knowledge and skills application/transfer to promote community ‘healthy island’ concept or outcome</th>
<th>Comparing past to present in ‘village mamas’ and papas’ perspective</th>
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<td>- men’s supportive role in maternal health</td>
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Suggestions for clinical/community practice improvement

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<th>knowledge deficient (competency skills need improvement)</th>
<th>new knowledge brings new problems</th>
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<tbody>
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<td>learning through self-checking and self delivery</td>
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<table>
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</tr>
</thead>
<tbody>
<tr>
<td>- clean living, not witchcraft and sorcery</td>
<td>- I did what I was told</td>
</tr>
<tr>
<td>- sharing paid knowledge</td>
<td>- VBA did not visit and talk to me</td>
</tr>
<tr>
<td>- ‘we could live like they’</td>
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<tbody>
<tr>
<td>- back to the roots or original</td>
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<tr>
<td>- influencing factors for changed practice</td>
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### 8.3.1 Organisational effects of University A’s BCMCH training.

The testimonial evidence from the three stakeholder groups—BCMCH graduates, VBAs and VCHWs and postnatal women—indicated the strengths of the transfer of specific knowledge and skills. Particularly highlighted was an ‘improved service delivery’, which enabled recognition of the stakeholders’ performance and community trust in University A’s educated healthcare providers. The recognition of their practice was a motivating factor for knowledge and skills transfer that informed meeting the organisational goals. University A’s new curriculum enabled the nursing professionals (BCMCH students and VBAs) to gain recognition, enhanced career prospects and engagement in professional nursing practice. The PNG Department of Health has pathways for professional development and career prospects for up-skilling nurses to enable competent practice, whether in education or the clinical service sector. University A’s BCMCH curriculum had the core aim of improving PNG child survival and maternal health (MGDs 4 and 5—see Chapter 4). However, it is contended that raising the skill level of health professionals is insufficient without instilling professional and personal qualities for leadership, mentoring, career prospects and ongoing education.

Under evaluation, the new knowledge and skills transfer provided by University A’s curriculum was seen by the BCMCH graduates to enable them to perform as team leaders, unit managers and supervisors in their organisations. In exploring the transfer of knowledge and skills from a set curriculum to engineering students, Bareiss and Katz (2011) found that positive transfer occurred when there was enhanced performance.

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<tr>
<th>Resources</th>
<th>Preferred clinical assessment for evaluating knowledge in low-resource setting</th>
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<th>Community to work in partnership with VBA</th>
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**Preferred clinical assessment for evaluating knowledge in low-resource setting**
- health facility
- community

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**Going the extra mile to reach the unreached**
- needing a ‘paddle’ to reach inland community

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These BCMCH graduates testified that University A’s new curriculum provided positive transfer, which improved their career prospects because they could perform in the scope of practice as BCMCH nurses, and undertake team leadership and managerial roles in the health or private sector. Isaac, Zerbe and Pitt (2001) identified the difference between a team leader and manager, stating that a leader takes control of a situation, creates a vision and strategies, and copes with changes, while a manager lives with the situation, implements outcomes, copes with complexity, and deals with administrative duties. In their testimonies, some of the BCMCH graduates stated they were able to commit to promoting and implementing organisational goals, despite the conditions they faced with converting knowledge into practice. Thus, it is contended that University A’s program met leadership competencies by producing nurses who had a role of creating visions and enabling strategies.

Evidence of the knowledge transfer of organisational leadership and practice was also recognisable when the VBAs took the initiative to provide financial support to mothers, such as escorting sick children and women in labour to healthcare, even though they had no formal financial support. There was a sense of trust and recognition from health facilities and communities in the enhanced performance of the VBAs and VCHWs trained by the BCMCH students. A systematic review of the factors influencing the performance of community health workers in low- to middle-income countries noted that communication between health professionals and community health workers increased VBAs’ role credibility (Kok et al., 2014). A qualitative exploratory study of the emerging role of TBA in mountainous terrains of Pakistan also noted that, despite the availability of community midwives, community members had greater trust and faith in TBAs because of their long-standing rapport with families and proximity to the women (Shaikh et al., 2014). The postnatal women in the current study also
recognised that the VBAs were doing their jobs successfully in providing support, help and accessibility in the community. Thus, the women called for continued community support to enhance VBAs’ performance.

These findings were further supported by the curriculum analysis in Phase 1. The curriculum units on community rural/urban maternal health issues, community rural/urban child health, village maternal health experiences, village child health experiences and community concept training (see Chapter 4) were intended to equip the VBAs and VCHWs with the knowledge and clinical skills to provide accessible support in terms of emergency referral assistance. However, for them to achieve this, they required organisational support.

**8.3.2 Achieving the organisational goals.**

The aims of the WHO’s MDGs 4 and 5 to improve child survival and maternal health will be achieved when all stakeholders are professionally educated and better supported to perform their clinical duties. In University A’s BCMCH program, all three stakeholder groups expressed a need for the program to be better financially resourced with equipment, simulations, textbooks and allied materials in education, the health service sector and the community. The BCMCH graduates recognised the effect of the program and the changes it made in the community, and expressed the importance of including this community experience in the curriculum, and expanding the program with sustainable support. The VBAs called for University A’s program to be reintroduced and sustained until a systematic evaluation is undertaken, before introducing new programs or projects.

Successful organisational goals can be achieved when working in partnership with all stakeholders. Niehof (2014) argued that approaches such as partnership can only be effective when implementation is adequately supported by resource allocation.
The VBAs expressed eagerness to do this work; however, they indicated the need for financial and resource support to implement specific tasks or responsibilities. A recent study on *Closing the Gap on Child Health in the Pacific* (Duke et al., 2015) stated that the village-based volunteers scheme had not been successful due to a lack of policy at government level to address the professional and financial support needed for volunteers, coupled with a lack of empowerment initiatives for rural women. In the current study, the stakeholders also discussed the need for resources and finances to help them work towards improving maternal and infant health goals.

### 8.4 Professional Effect of Knowledge and Skills Transfer on Stakeholder Groups

The participants in all three stakeholder groups agreed that they felt they had an improved level of clinical skills and knowledge due to participating in University A’s program. The main knowledge seen to be acquired by University A’s bachelor graduates was identifying the ‘too sick’ signs from the WHO IMCI checklist. Infant mortality in PNG remains significantly high compared to its neighbouring Pacific Island countries (Duke et al., 2015). Prior to University A’s BCMCH program, the participants testified to superficially examining and treating childhood infections; however, the introduction of the IMCI checklist enabled them to identify the underlying problems and provide more effective treatment.

Knowledge about identifying ‘too sick’ signs was further transferred to the VBAs and VCHWs, who stated that their practice improved considerably by ‘having doctor’s eyes’ to recognise ‘too sick’ and ‘not too sick’ signs, and referring babies to hospital. The VBAs and VCHWs also testified to being able to recognise different diseases or infection signs specific to different age groups, as an outcome of University
A’s BCMCH program. The postnatal women did not mention seeking help when their babies were sick, but testified to an improved knowledge of when to have their babies immunised. The trend of professional knowledge passed from University A’s BCMCH program to the associated stakeholders indicated reasonable evidence that referral and infection signs knowledge had been transferred to the stakeholders.

From University A’s curriculum, the BCMCH graduates testified to learning many new and advanced skills in midwifery specialist procedures, such as vacuum extraction delivery, twins and breech delivery, managing high-risk pregnancy and childbirth, as well as child health problems (University of Goroka, 2008). This newly acquired knowledge was seen to give the graduates a better understanding of the causes and management of obstetric problems and complications, which informed their educational knowledge and clinical skills transfer to the VBAs and child health workers.

Other areas of convergence of knowledge transfer were related to childbirth preparation and procedure, using the ‘three cleans’ technique, in which birth kits are used to promote clean birth practice for maternal and newborn outcomes (Hundley, Avan, Braunholtz & Graham, 2012). The BCMCH graduates testified that they had learnt about normal and abnormal pregnancy and birth, including core information on safe birth and risk factor recognition, and the use of the ‘three cleans’ in preparation for childbirth, which was then taught during VBA training in the community setting. In practising the ‘three cleans’, the VBAs and VCHWs in resource-poor settings—with no adequate supply of clean birthing kits—testified to using readily available items, such as clean banana leaves and palm leaves to conduct deliveries; a store-bought razor blade or clean, sharp piece of bamboo to cut the umbilical cord; and a clean piece of rope to tie the umbilical cord. The postnatal women interviewed stated that, due to the education program, during their antenatal period, they knew which necessities to buy to prepare
for their baby and themselves (particularly if they had an unpredicted village birth), such as cord clamps, clean razors and clothes for the baby and themselves.

The VBAs also testified to being taught by University A’s BCMCH students to follow proper procedures in telling a mother to wait until she was ready to deliver and, upon seeing the baby’s head, asking the mother to push, which traditionally was never practised. The postnatal women reported now following the VBAs’ instructions, which led to improved health outcomes. This indicated that women in the village were now more empowered to follow instructions and apply health promotion knowledge to enable safer birth outcomes.

The community practice experience for the BCMCH graduates was not only for the purpose of imparting knowledge and skills to the men and women in the community, but also to enable the graduates to recognise the specific difficulties faced by the women in the community. The nurses and VBA and VCHW’s ability to recognising maternal and neonatal health risk, potential obstetric emergencies and when to refer to hospital expertise was crucial for successful and safe motherhood. A systematic literature review examined the existing data on successful obstetric referral strategies, and contended that many low resource countries’ healthcare systems have failed to optimise women’s rapid access to emergency care. The review also highlighted the importance of having adequately equipped referral centres, improved transport arrangements and an affordable healthcare service (Murray & Pearson, 2006). The current study’s findings in the PNG context strongly indicated the importance of collaborative support and recognition by all stakeholders, from policymakers to end users (people in the community), for developing sustainable, accessible and affordable means of obtaining successful health outcomes (MDGs 4 and 5).
The graduates testified to gaining an improved understanding of the complexity of geographical locations, distances and modes of travel, which encouraged them to be more available and prompt when attending to women and children. The graduates testified to feeling better prepared to support women and children due to the knowledge and skills gained from their first-hand experience in the community placement. Many graduates recalled entering an environment that was very different to that of their own up-bringing, while others stated that their education and employment had taken them away from their home communities, and the placement enabled them to experience the real-life situations of their fellow countrymen and women.

As well as providing supportive and timely care, embedding nurses in a rural curriculum to familiarise them with working in remote conditions can change their attitudes and behaviours towards others, and attract them to work in remote settings (Efendi et al., 2015). University A’s BCMCH graduates testified to being drawn to work in a rural setting to implement what they had been taught in the BCMCH curriculum; however, they were unable to take up the positions for which they had been trained due to the restrictive nature of the PNG Health Department’s terms of employment. The graduates testified that the rural experience had made a difference to their ways of approaching and caring for clients. Thus, having a curriculum with a rural focus will not only provide a specially trained workforce to fill the current PNG national staff shortage, but will also reduce public stereotypes of nurses’ approach to women’s and children’s healthcare (Efendi et al., 2015; Vallely et al., 2013).

The interviewed VBAs and VCHWs further testified to having improved knowledge of the importance of saving the lives of women and children in the community. They stated that University A’s BCMCH students had provided an understanding of the distance the women needed to travel, and they acknowledged the
subsequent importance of early referral. The VBA and VCHW acknowledged the new knowledge they had acquired on the importance of promoting child health in particular education on nutrition for children’s growth and development and the promoting immunisations. The importance of TBAs in promoting immunisation and nutrition to prevent childhood mortality was identified in a study conducted on the role of TBAs in Pakistan (Shaikh et al., 2014). In the current study, this knowledge transfer was evident when the postnatal women discussed the advice they had received from the VBAs and VCHWs on what to prepare for childbirth, such as purchasing items for the mother (clothes, towels, bedding, modess (sanitary pad) and soap) and the baby (such as clothes, nappies, umbilical cord clamps and baby clinic record books). The interviewed postnatal women also received advice from the VBAs and VCHWs on the importance of having their babies immunised.

8.4.1 Promoting healthy homes through VBA and VCHW training.

The effect of University A’s tertiary health educational program was further evident in the knowledge and skills transferred to the community to promote healthy living in a village setting. The program to promote healthy homes conducted through University A’s BCMCH community practicum included a ‘situational analysis’ assessment task of the village environment and disease trends. This situation analysis enabled University A’s BCMCH students to give evidence-based training on the issues identified, and provide preventive or health promotional education. In many PNG villages, the specific problems identified included the prevalence of diarrhoeal diseases due to the lack of proper toilet facilities. This finding concurred with similar results found in an Indian-based study, in which most households in rural areas were without a toilet or latrine, which contributed to diarrhoeal diseases (Joumard & Kumar, 2015).
The BCMCH graduates outlined that, during their student community placement, they had been involved in constructing a contemporary toilet building (termed ‘VIP toilets’) with a handwashing facility outside. This was in contrast to the previous practice of faecal disposal in the nearby bushes or river, leading to enteric diseases, such as typhoid and shigellosis (Horwood & Greenhill, 2012). In 2010, the timely and targeted use of health prevention messages enabled cholera to be contained in the coastal and highlands regions. This study’s stakeholder groups stated that the practice in many parts of PNG to use bushes or a nearby river for urination and defecation results from a lack of basic hygiene knowledge. Furthermore the newly acquired education enabled a dispelling of the beliefs in the protective power of sorcery previously seen to provide strengths for enemies (sorcerers) attack (see Chapter 5). This constituted a remaining gap in University A’s BCMCH curriculum health promotion knowledge content that required more extensive health promotion input.

Another major health concern identified by University A’s graduate cohort was the need for further knowledge on lung conditions—mainly chronic obstructed airway disease in adults, and pneumonia in children. Round or square-shaped low houses are commonly built in the highlands of PNG, without windows, in order to provide warmth during winter. The perceived prevalence of lung disease was evidenced in research by Railey (2010), who found that the occurrence of pneumonia in the highlands of PNG is linked to poor ventilation and the climate. This is in contrast to the PNG coastal regions, where malaria is a common illness. In the current study, the prevalence of malaria was acknowledged by the VBAs and VCHWs, who felt that University A’s BCMCH curriculum had enhanced and updated knowledge on the transmission and spread of infectious diseases.
Further evidence of curriculum knowledge transfer was seen when the VBAs and VCHWs compared their past living practices with current evidence-based lifestyle choices. An example was having windows in their houses for improved ventilation, clearing the bush scrubs growing near their houses, and beautifying their houses by planting flower gardens to prevent mosquito breeding. Further, building a pit for garbage waste disposal to prevent flies and mosquitoes breeding and spreading diseases was part of a healthy lifestyle choice. They further testified to having new knowledge about daily living, such as the importance of washing hands before food preparation and after toilet usage, and the risk involved with health ignorance. They testified to acting differently to their previous practice, which reflected the influence of positive curriculum knowledge and skills transfer (Davies et al., 2011).

8.4.2 Tangible support for ‘fruit bearing’ initiative.

All stakeholder groups discussed the BCMCH program’s considerable content regarding the role of men in contributing to the healthy homes program in the villages, and in antenatal and postnatal care. This was in contrast to long-held PNG cultural beliefs and practices that keep men’s and women’s health as separate affairs. Pregnancy, childbearing and home chores are historically seen as women’s affairs, with men providing less support in child rearing (Holmes, Davis & Luchter, 2013; Kura et al., 2013). In a news report on engaging men in maternal and child health in PNG, Professor Luchter of the Burnet Institute (Australia’s largest virology and communicable disease institute) noted that there is evidence that when men are involved in health education there is an increased likelihood that women use contraceptives, reduce the workload, and receive formal health care assistance during antenatal and postnatal periods (Somerville, 2013).
In support of men’s involvement in women’s issues, a descriptive study by Kura et al. (2013) examined men’s involvement in sexual and reproductive health in the Southern Highlands of PNG, and found that many men knew about health services, such as family planning, antenatal clinics and supervised births, but were unaware of the importance of these services. Another survey study conducted in PNG on maternal deaths and decision making by Kirby and Gawin (2015) found that, of 31 deliveries that occurred in a village setting, 16 women died. These deaths were attributed to men dominating decision making on referrals to a health facility, which was influenced by them taking responsibility for finances and delaying calling for help when their wives were having difficulties during pregnancy and childbirth. This delayed decision making was found to have contributed to most of these deaths. Thus, Kirby and Gawin recommended that men be included in antenatal education and care. In the diverse cultural context of PNG, it is vital to involve men in woman’s health issues, yet, for many years, sociocultural factors have hindered men and women working in partnership for the betterment of women and children (Kirby & Gawin, 2015).

The convergent findings from all phases of this study also found that BCMCH curriculum knowledge on ‘healthy homes’ messages was transferred to all stakeholders seen in the VBA and VCHWs campaign in promoted healthy living. However, Duke et al. (2015) challenged the Pacific government’s support of the UNICEF healthy homes program, and argued that many of these programs have not been adequately implemented. Duke et al. (2015) called for a broader rural development model that fits the Pacific context, underpinned by adequate financing. In the current study, the postnatal women also testified to the VBAs’ and VCHWs’ need to be supported to provide considerable help in the community setting.
The stakeholders also identified limitations in medical resources, such as birthing kits, to assist VBAs and VCHWs to provide clean and safe deliveries during emergencies in the village. The lack of financial support for VBAs and VCHWs was seen as a limitation to the current health service, as many VBAs and VCHWs stopped working when they could not sustain themselves in the community. Although they still wished to do the work, they struggled financially due to its voluntary nature. The name and definition of ‘volunteer’ made it difficult to receive support from organisations and governments. As such, University A’s program titled the community-trained attendants ‘workers’, with the aim of recommending long-term financial support from both local and national governments in PNG.

Further of note is that the attendee VBAs and VCHW testified to minimal support received in ‘cash and kind’ from treated family members. An initiative in Pakistan used monetary incentives for every referral undertaken by TBAs from community-based midwives. This strategy was found to enable early interventions and continuity of care (Shaikh et al., 2014). When supported with financial incentives to make referrals, this Indian social franchise model network—known as Sky Care—saw increasing health facility deliveries, and substantially reduced maternal mortality (Pereira et al., 2015). In PNG, it is critical that similar support be provided—whether at the structural, workforce or resource level—if organisational goals are to be met, especially for achieving safe birth outcomes at health facilities.

### 8.5 Personal Effect from University A’s BCMCH Community

**Component Knowledge Transfer**

The transfer of knowledge and skills in the BCMCH program during the community experience indicated personal strengths and challenges for all
stakeholders—the graduates, VBAs, VCHWs and postnatal women. For the BCMCH graduates, visiting the community—which was an unfamiliar environment in a different geographical location and with a different culture—resulted in better understanding of the difficulties faced by remote and rural postnatal women. The rural experience promoted and increased appreciation of transportation issues, financial difficulties, and the distance travelled and mode of travels used by expectant mothers. The rural placement served to provide context of care and informed the nurses’ availability to provide a targeted health service for mothers and children. A common practice acknowledged by the graduates and observed by the researcher is that, in many health facilities in PNG, staff cease working because a shift has ended, which does not accommodate the reality of obstetric deliveries and the time taken to reach the health clinic in difficult terrains. There was widespread acknowledgement during the face-to-face interviews that University A’s BCMCH education enabled these graduates to realise that the clients (mothers and children) were the primary focus of care, and that these mothers and babies were important and central to their practice. University A’s BCMCH training was also seen to enable the graduates to approach mothers and their babies with patience and with a more caring attitude. As such, in the Phase 3 and 4 interviews (with VBAs and postnatal women), the participants testified to having minimised fear of approaching the nurses.

The community-focused education undertaken by University A’s BCMCH graduates provided a health leadership–based change agent to enable better public health outcomes in PNG. Llopis (2012) identified priorities for motivating professional and organisational change that can be applied to the PNG setting, particularly in terms of education in leadership, career advancement and promoting a stable future. Many convergent themes from the stakeholders groups and curriculum analysis were seen to
inform improved clinical and public health practice, while the impact of the community practice at personal and professional levels profoundly influenced rural population public health outcomes. The community practicum transferred positive attitudes that led to health promotion activities among the nurses, VBAs, VCHWs and rural communities, which created transformational and transactional leadership through evidence-based community practice (Aarons, 2006). A transformational leader is defined as someone who creates a vision that inspires and motivates followers to strive beyond expectation, reward and exchange (Aarons, 2006). This experience led to professional career advancements, in which graduates were placed in supervisory and management positions in their places of employment.

This approach of community practice via transformational leadership enabled transfer of the education and skills for graduates and for the VBAs and VCHWs and the associated village communities. As a result of the community VBA and VCHW training, the postnatal women interviewed spoke of enabling personal and familial changes in their homes and families. They testified to no longer experiencing diseases and infections since the introduction of the ‘clean living’ program. Previously in PNG, as outlined by Lepowsky (1990), the beliefs system blamed witchcraft and sorcery for many deaths. This perception was challenged by University A’s trained VBAs and VCHWs, who educated women on the cause of ill health resulting from unhygienic practices.

Through University A’s BCMCH program, the PNG communities were educated on the causes of illness through evidence-based health education and the interaction of University A’s students and trained VBAs and VCHWs with the community. Instead of using outdated health education posters and pamphlets to provide general information, the graduates, VBAs and VCHWs used personal
testimonies to impart specific health education. Through transferring knowledge from University A, the community participants (VBAs, VCHWs and postnatal women) testified that they could live a healthier lifestyle in their villages because the root causes of disease were identified and steps were taken to eliminate the problems. University A’s BCMCH program focused on key public health messages, such as the importance of clean environments, water and sanitation. Despite using traditional bush building materials, the VBAs and VCHWs testified that they could live healthy lives in their villages, and benefited from having clean environments. However, in many other areas of PNG, clean water and sanitation are lacking or underdeveloped because of the geographical surroundings, with only 15% of people living in urban settings with access to adequate sanitation (Duke et al., 2015).

8.6 Thematic Divergence in Knowledge and Skills Transfer

Although all three stakeholder group members identified a number of strengths in the transfer of knowledge and skills, there were also divergent themes notes, in which knowledge and clinical skills had not been transferred. These divergent themes included the particular limitations posed by the paucity of learning resources in educational facilities, health or hospital settings, and the community. In low-resource settings, the lack of resources affects not only learning, but also the care provided. For effective healthcare provision that benefits the targeted recipients, adequate educational and clinical equipment and materials are needed. The sources of health information included informal, such as the internet, newspapers, books and magazines and information from friends and relatives. For formalised information the use of an accredited university based curriculum using evidence based practice further enhance knowledge delivery allowing the specific cultural setting upon which to base the learning outcomes (Rooks, Wiltshire, Elder, BeLue & Gary, 2012).
The disparity of health education resources between high- and low-resource populations has been found to have adverse effects on knowledge acquisition (Rooks et al., 2012). This phenomenon is not unique to low-resource countries, as it has been found to be prevalent even in the US. A nationally representative house tracking survey of civilian, non-institutionalised Americans found that populations who were socially disadvantaged and had a low socioeconomic status were less likely to have access to a wide range of information (internet, newspapers, television, books and magazines) than were populations with a high education and urban status (Rooks et al., 2012). Women in remote, rural and socioeconomically-disadvantaged communities, such as in PNG, have limited access to information to make informed choices regarding their health status. To obtain and understand health information, it is necessary to have a pathway of communication between a nurse/doctor and their client. This was evident in the information provided by the VBAs, VCHWs and postnatal women, who were grateful to receive information to better inform their health choices.

In University A’s program, in addition to basic teaching and clinical resources, an approach taken to promote learning involved using case studies of real situations. For example, students attended a clinical area, examined a high-risk mother or child, and then developed and implemented care. In middle- and high-resource countries, clinical skill learning and education are facilitated by well-equipped laboratories with mannequins, electronic and online computerised resources, adequate library books and materials, and web-based recorded lectures and clinical facilities to enable a multimodal style of learning. In PNG oral communication and practical demonstration as well as documented learning styles as discussed in per chapter 4. Bloomfield et al. (2015) recently argued that face-to-face learning remains a valuable learning approach to clinical education. In PNG, especially in the BCMCH curriculum a multimodal
approach was used to promote learning, comprising workshops (such as for HIV/AIDS), a rural clinical experience practice, clinical case studies, and clinical bedside teaching.

University A’s health programs had limited teaching aids and clinical laboratory resources, which the graduates indicated as needing improvement; thus, most teaching was done through face-to-face learning in classroom and clinical settings. Face-to-face interaction and return process evaluation and practical demonstrations provide immediate feedback to understand the extent to which learning has taken place. In the US, despite the use of technology and online nursing education for nursing students, face-to-face learning still has the benefits of providing physical proximity, human interaction and immediate feedback (Gruendemann, 2011). In the current study, University A’s BCMCH graduates quoted that ‘being there’ or ‘being present’ had enabled them to understand the educational material and obtain feedback on their learning outcomes. Gruendemann (2011) stated that non-verbal communication is lost when not using face-to-face interaction. Of particular importance in a highly non-verbal culture such as PNG, some BCMCH graduates noted that the availability of staff had promoted face-to-face educational interaction and learning, while other graduates reported lack of supervision in the clinical setting, which had affected their learning.

In University A, another frequent mode of education was the use of hands-on practice and case studies (see Chapter 4). Much of the learning occurred when case studies were conducted and presented on various medical, paediatric and obstetric problems when no mannequins were available for simulated learning. The uniqueness of a case study–based approach is that it generates an ‘in-depth multi-faceted understanding’ of complex issue in a ‘real-life situation’, compared to practising on mannequins (Crowe, Cresswell & Robertson, 2011). For example, in a real-life case study, the planning and care given to an antenatal woman presenting with bleeding
during pregnancy would provide a real-life physical event highly evident and well understood by the PNG health care students. As opposed to using mannequins (pelvis-only type) in University A’s practical laboratories, the examined people (patients) were able to express their feelings and thoughts, which is essential in a folk-based culture such as PNG. As highlighted by many participants, a significant strength of University A was the use of case-based learning and teaching.

The VBAs voiced concerns regarding the lack of educational resources for items such as clean birthing packs for deliveries conducted during emergencies. Perineal infections are common in PNG; thus, practising the perineal cleaning skills taught during training was of paramount importance. The VBAs and VCHWs were taught to use clean delivery methods in the community; however, if not supported with clean resources, the knowledge and skills could not be transferred. In PNG, the training and performance of volunteers in communities has failed in the past, which is thought to result from a lack of support in terms of financial or consumable resources, as well as a lack of community and family support (Bettiol et al., 2004; Duke et al., 2015).

Despite the interest from stakeholders in performing the skills they were taught, resources in terms of infrastructure and human resources became the main concern identified. University A’s BCMCH graduates appreciated the education and training they received, but felt unable to implement what they had learnt due to placement in clinical areas not directly relevant to the knowledge and skills gained. Also of critical importance was the lack of clear nurse licensing, registration procedures and employment pathways constructed prior to conducting the BCMCH program. Instead, the program was developed and implemented due to the pressing health concerns of increasing maternal and infant mortality in PNG, further creating issues in the BCMCH registration and scope of practice. This ongoing issue of lack of registration, scope of
practice and career pathways has caused a workforce shortage that is currently in the process of being rectified (University of Technology Sydney, 2014 March).

Another major divergence in the knowledge and skills transfer identified by the postnatal women was that, while they had attended antenatal clinics, they still chose to deliver their babies in the village. The VBAs testified that they felt that knowledge on the risks of village birth had been effectively transferred to these postnatal women, yet they continued to deliver at home. In a recent study on the factors affecting choice of place for childbirth in Ethiopia (Weldearegay, 2015), of the 458 women interviewed, 21.2% gave birth at a health facility due to fear of complications, with 18.8% stating that this was due to health education information received on the benefits of institutional birth. The majority of 40.8% stated that they delivered in the healthcare facility because it was a safe and clean place for childbirth (Weldearegay, 2015). In the current PNG study, with many women reporting that they delivered at home because of lack of transport, distance to health facilities, labour commencing at night, and trusting and receiving support from the VBAs. In the PNG culture, family ties have ritualistic significance for women to deliver at home, which is also found in other low-resource countries. For example, studies in Pakistan (Shaikh et al., 2014) and Ethiopia (Weldearegay, 2015) reported that women’s trust and faith in TBAs was a primary reason for village home birth.

The postnatal women noted the need for VBAs and VCHWs to be supported with basic resources in the community, such as clean birthing kits and a centrally located birthing house. They also reported a need for community partnership, such as helping VBAs and VCHWs with their gardening, building their houses, or providing them with food so they can do their work in the community. Alongside the current PNG public/maternal health information on the benefits of health institution deliveries and
the risk of village births, there is also a need to bring formal healthcare services closer to villages. This can be achieved by continuing the education of VBAs and VCHWs. Also essential is an adequate VBA and VCHW salary as well as additional travel allowances and medical diagnostic equipment such as weighing scales for geographical remoteness, as reported in the convergent themes in the current study.

8.7 Gaps in Knowledge and Skills Acquisition and Transfer among All Stakeholder Groups

Table 8.3 thematically maps the transfer of knowledge identified by the three stakeholder groups, originating from University A’s program. The stakeholders testified to new knowledge transfer, while acknowledging the limitations encountered during the transfer of organisational, professional and personal knowledge and skills.

Table 8.3

Gaps in the Knowledge

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<tr>
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<th>BCMCH graduates</th>
<th>VBAs and VCHWs</th>
<th>Postnatal women</th>
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<td><strong>Organisational</strong></td>
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<td></td>
<td>and VCHW training</td>
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<td>acquisition</td>
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<td>and appropriateness</td>
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<td>• adequacy (new approaches and concept for training)</td>
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<td>• inadequacy (less knowledge and skills, working in)</td>
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Community collaboration and family partnership are frequently upheld as the gold standard for project or program implementation, whether in health or other government sectors (Pancer, Nelson & Hasford, 2013). PNG’s previous public health service delivery through a top-down approach had no significant effect on the high rates of maternal and infant mortality, especially because basic services did not reach the most remote and disadvantaged service recipients (Razee et al., 2012). In PNG, government organisations and NGOs have introduced new projects and programs to

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<th>different setting</th>
<th>Comparing past to present in ‘village mamas’ and papas’ perspective’</th>
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<td></td>
<td>• new knowledge, better practice</td>
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<th>Learning enhancement strategies for knowledge acquisition</th>
<th>Being ‘well’ or ‘okay’ are reasons for home birth</th>
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<td>• learning through group work, case study and presentations</td>
<td>• ‘I am okay, I am not sick’</td>
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<td>• ‘I did not want to go because I did not want’</td>
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<th>Personal</th>
<th>Family support in pregnancy and childbirth</th>
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<td>• ‘VBA did good to me, they are a great help’</td>
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<th>Unplanned pregnancies and family planning</th>
<th>Unplanned pregnancies and family planning</th>
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<td>• teenage pregnancy, trust and home birth</td>
<td>• teenage pregnancy, trust and home birth</td>
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<td>• family planning—‘new change’</td>
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<th>Limitation to knowledge acquisition</th>
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meet the goals set by the government to meet the country’s healthcare priorities, such as the ‘healthy island’ project (Puka & Chen, 2000), Village Health Volunteer program (Byrne & Morgan, 2011), Child Fund Australia (nd) and many others. The VBA and VCHW training was one such program, supported by donor funding in PNG. The interviewed VBAs and VCHWs stated that programs brought into communities were not ‘bearing the fruit of success’ because they were often not grounded in partnership models and involved no ownership by the recipients. In addition, before attaining success, the programs moved to another location or introduced new ideas, programs and projects. Participants in a PNG study that focused on the needs of rural health workers (Razee et al., 2012) suggested that sustainable change only occurs when a bottom-up approach is used, in which locals make decisions that affect the community, and community members participate in health activities. To date in PNG, as in other low-resource countries, many VBA and maternal health initiatives have lacked success and sustainability due to not being based on an initial community-needs assessment.

Worldwide health outcomes are generally attributed to a broad range of socioeconomic, educational and health-related efforts to tackle poor living and lifestyle habits (Joumard & Kumar, 2015). University A’s BCMCH program enabled students to live in villages, undertake a situational analysis, and implement projects or training according to the needs of the community. University A’s community approach to VBA and VCHW training was unique in PNG because, for the first time, students were residing in the community; conducting health needs analysis in consultation with the community; and developing implementation strategies for remote rural villages to take ownership of planned projects, such as healthy homes initiatives and road construction. For example, one of the study sites in a highlands community needed a road for transportation during emergencies, for health checks, and for delivery of supplies and
workers. After identifying the need for road access, the whole community helped build the road; however, after the students left, the road fell into a state of disrepair. This road building was not part of the community practicum; however, the results from this informed recommendations for future PNG based maternal and child health curriculum (see Chapter 9). Another example is the healthy homes project, which was introduced in direct response to diseases and problems identified in the villages. While the community was involved in this project, ensuring its sustainability would have required regular visits to the involved villages, and regular monitoring and meeting with these communities.

Another major issue identified was the rate of infertility in the community, which was discovered by students collecting health-related demographic and epidemiological data during their placement. The emerging data enabled the students, VBAs and VCHWs to conduct health education sessions with separate gender groups on HIV/AIDS and STIs. Community members gathered to discuss issues that were usually culturally prohibited, but were able to be discussed due to the gender-oriented sessions, in which male students met with male community members, while female students met with female community members, including girls who were near or had passed puberty. This approach enabled open discussion on issues related to sexual health, and facilitated community trust of the students, VBAs and VCHWs to openly discuss their personal issues (as discussed in Chapter 5).

In PNG, HIV/AIDS occurrence is high, with increasing cases in the Asia Pacific region. In this region, 49% of men compared to 35% of women know that using a condom can prevent transmission of HIV, which highlights a gender knowledge gap (The World Bank, 2011). In PNG, a high proportion of the population resides in rural communities, where the rate of STI testing and recording (particularly for HIV) is low
compared to that in urban settings (Bruce et al., 2015). However, even in urban centres, such as Port Moresby, where health protection knowledge is available (such as condom use for STI prevention), it is not adhered to (Cullen, 2006). Therefore, when the students in the current study disseminated information on HIV/AIDS and STIs, they reported that the rural communities responded with ‘open minds’ and ‘an eagerness’ to know their HIV status. After health education on STIs and HIV, the BCMCH graduates testified to the village communities gathering in large numbers to have counselling and testing for HIV and examination for STIs, which was not common in the past. Previously, people avoided being tested for HIV due to fear of violence, discrimination, stigma and rejection after receiving positive results (Lepani, 2009); however, University A’s students challenged the misconceptions and promoted the benefits of early STI and HIV testing. The increase in attendance for testing and check-ups by the individuals exposed to the BCMCH community education was also evident in the provincial report linked to the testing site (Eastern Highlands Provincial Health Authority, 2013).

When receiving education on the transmission and prevention of HIV, the VBAs and VCHWs alluded to fears of conducting village-based child delivery. The VBAs and VCHWs commented that they had used shopping plastic bags as hand gloves during emergency deliveries in the villages. One VBA stated that she had tied plastic bags to her feet and hands and made sure she had no open sores when delivering, in fear of HIV infection and to promote hygienic delivery of babies (Chapter 6). This testimony highlights the paucity of medical resources available in the villages, a common testimony in all stakeholder groups. Both the graduates and VBAs and VCHWs testified to understanding the importance of mother-to-child HIV transmission, and the importance of testing and early commencement of antiretroviral drugs. The VBAs and VCHWs from the BCMCH education testified to referring pregnant women to the
nearest health facility for further antenatal examination and routine testing for HIV status.

The BCMCH graduates stated that the curriculum knowledge taught was sufficient for their maternal and infant healthcare practise, but stated that they were unable to perform the clinical tasks due to shortage of resources. The graduates were educated in maternal and child health knowledge and skills intended for rural health post-placement; however, instead, they were allocated employment in hospital settings. The aim of University A’s BCMCH program was to educate nurses in maternal and child health, and place them in remote rural settings, where they could manage obstetric and paediatric problems interchangeably and practice in either paediatric/child health or obstetrics and gynaecology units to relieve staff shortages in the country. To date, PNG has a crucial shortage of health workers, which has affected healthcare provision in all facilities, both in rural and urban settings (Dawson et al., 2011). In 2014, a PNG study on improving paediatric and neonatal care in a rural district hospital found that around 50% of deaths in children and neonates were from pneumonia and neonatal conditions, and that many postgraduate paediatric nurses were performing administrative duties and not actively involved in clinical care (Sa’avu, Duke & Matai, 2014). In low-resource settings such as PNG, where there are few skilled birth attendants often the available community nurses are not educated in areas in maternal and child health is a considerable need to strengthen MCH target workforce and associated rural placement of the appropriate staff. University A’s program offered a new higher education nursing curriculum that aimed to reduce the shortage of the current skilled workforce. Internationally, VBAs, VCHWs and nurse aids are not recognised as ‘skilled birth attendants’ under the 2004 joint statement by the WHO, ICM and International
confederation of Gynaecology and Obstetrics (WHO, 2004) thus, multiskilling of University A’s students was deemed necessary to fill the gap in the workforce.

The cohort VBAs and VCHWs surveyed in the current study acknowledged that their newly acquired knowledge created some additional problems because, while they could more fully identify and potentially manage presenting health problems, they did not always have the equipment or support to do so. For example, one VBA witnessed a woman with vaginal bleeding at four- to five-months pregnant (spontaneous abortion) and now knew that such bleeding was abnormal; however, she had no resource capacity to intervene. For the VBAs and VCHWs, the major focus of training—in alignment with the VBA modules of University A’s curriculum—was that of referring pregnant women to hospitals, especially when they encountered an identified emergency situation. While the VBAs and VCHWs testified to having newly acquired knowledge, they also experienced insufficient resources and referral dilemmas related to cost and lack of transport. Similar to the healthy village project initiated in the community, these VBAs and VCHWs needed to have regular compliance audits and further up-skilling for them to perform their tasks effectively.

The VBAs and VCHWs used their newly acquired skills and knowledge to identify and manage health problems, which they testified to improving living standards in their communities. This also provided role models for others to implement similar changes. For example, a VBA planted a flower garden, kept her lawn short, fenced her pigs instead of letting them loose, and built small tables to store cooking utensils instead of keeping them on the ground. This motivated others in the community to do the same, and live healthier lives.

8.7.1 Postnatal women’s perspective on village birth. During interpersonal transfer of the new knowledge, the postnatal women were given health information
about the risk of delivering in the community; however, many still testified to preferring village birth, with assistance from the VBAs. In addition, recently in PNG, Vallely et al. (2013) contended that some women continue to deliver in the village due to lack of transport, considerable distances to health facilities, and labour occurring in the night. It was further contended that poor socioeconomic status, low educational level (Kirby & Garwin, 2015), poor relationship with healthcare facilitators and preferring the service of TBAs have all contributed to the incidence of village births. This was also found in a cross-sectional study conducted in southern Nigeria, where women still sought assistance for giving birth from TBAs in their community (Oshonwoh et al., 2014). Another cross-sectional study on the factors associated with rural deliveries outside a health facility found that women without formal education chose to deliver outside health facilities, compared to high socioeconomic, urban women (Mazalale, Kambala, Brenner & Chinkhumba, 2015). There was an increase in hospital births among women who had formal education on the benefits of institutional birth (Weldearegay, 2015).

In the current PNG study, despite attending antenatal clinics and receiving health information on risk factors, women in both the highlands and coastal regions chose to deliver in the village, stating that they were ‘feeling okay’ and were ‘not sick enough’ to attend a health facility. A feeling of physical wellness and absence of ill health provided an unseen barrier to health facility births, which has not previously been noted. Another PNG study examining why rural women chose to deliver in the village found that many women were confused about their date of delivery and that health centre birthing costs were expensive at ($2 to 4.50 Australian dollar) as often $1= to a days work in a village for subsistence village women (Kirby & Gawin, 2015). Another factor shared by these rural women was shame of their impoverished state and not having baby clothes, which influenced their decision to remain at home for delivery of
their baby. This finding compares to that of a qualitative study on the experience of Malawian women who delivered with TBAs, which reported that barriers to hospital-based deliveries included unsupportive and unavailable husbands, and embarrassment resulting from having less personal belongings than others (Ryan et al., 2014).

Other reasons for village-based childbirth in the PNG study included poor toilet and washing facilities, and no food for the mother or her guardian at the health facility (Kirby & Gawin, 2015). In PNG villages, families are often very close, and even extended family members contribute support during childbirth and the postnatal period. Thus, women opted to deliver in the care of VBAs due to the notion of the help and support they received, with some women stating that the ‘VBA are doing good to them’ and are a ‘great help’. A study in Tanzania on health-seeking behaviours found that women opted to deliver in a private and confidential environment with someone in their community who they trusted. The same study also found that hospital facilities did not provide social and emotional support or comfort, in contrast to care from TBAs (Bintabara et al., 2015). These findings were similar to the testimonies of postnatal women in the current PNG study. In the current study, postnatal women expressed the support received from TBAs in terms of fetching and boiling water to wash the baby after birth, cooking food to feed the mother, and making a fire for warmth in the cold PNG highlands.

In many hospital settings, especially in PNG, privacy is not always maintained, with women delivering in wards often only separated by curtains around each cubicle. This contrasts to the village setting, where women can deliver in their own homes or in a small birthing house, which are still built for cultural reasons to accommodate menstruating women and childbirth in many parts of PNG. In an effort to have women deliver at a health facility, some facilities have built a ‘waiting house’ with a similar
structure to village houses—such as at Lufa Health Centre. However, these houses are currently not used. Both the VBAs/VCHWs and postnatal women expressed a need for a similar house to be built in the village for such circumstances to create a clean environment for childbirth, instead of delivering in the bushes or other dirty areas.

8.7.2 Teenage pregnancy, village birth and the unseen risk for VBAs.

The postnatal teenagers in PNG also preferred to deliver in the village, with the assistance of VBAs; however, their reasons for this differed. They did not wish to encounter the ‘embarrassment and shame’ they would feel among midwives or other mothers in a hospital. A Malawian study also found that unmarried women were significantly more likely to deliver outside the health facility with assistance from TBAs, citing the bad reputation of formal health providers (hospital staff) as a key reason for not attending health facility birth (Ryan et al., 2015).

In PNG, with population growth of 2.1% from 2010 to 2015 (Setepano, 2013) unplanned pregnancies, particularly among teenagers, are cited as placing women at high risk of obstetric complications. The number of teenage pregnancies and deliveries has increased in the last decade, and has been colloquially termed ‘babies having babies’ because these teenagers are not physically or emotionally prepared for parenthood. In the past, teenage pregnancies brought shame, stigma and discrimination on the family. The same experiences have been noted in West Papua (Butt & Munro, 2007) and in all Pacific Island nations (Ali, 2006). Girls have access to education; however, due to lack of correct information on sexual and reproductive health being taught in schools and propagated on social media forum, many fall pregnant while at school (Ali, 2006).

Sexual education is not only lacking in schooling, but also among parents due to cultural and religious barriers. In 2012, recorded data showed that around 13% of girls
between the ages of 13 and 19 were pregnant, with the figures predicted to rise if sexual education is not prioritised in schools and homes (Setepano, 2013). Cultural barriers to sexual education include many parents fearing that giving such information will encourage sexual experimentation among school children. Ali (2006) stated that parents in PNG need to overcome this cultural fear and educate their children at home. The VBAs in this study also noted the increase in teenage pregnancy and the burden it places on these teenagers’ mothers to care for the children. The burden placed on mothers to care for unplanned grandchildren from teenage pregnancy was also experienced by women in the Papua province of Indonesia (Butt & Munro, 2007).

Not only does teenage pregnancy pose a socioeconomic burden on women and communities in PNG, but it also exacerbates the risk placed on the VBAs who have to deliver these teenagers in the village when they refuse to attend hospital birth. An example was one teenage participant who stated that she delivered at home because she did not want to go because she did not want [to]’. In such cases, VBAs are faced with a situation of helping as women when in labour and often turn up to give birth which is problematic in remote rural setting when there is no access to transport and the health facilities are far posing far greater risk for VBAs.

8.7.3 Family planning as an agent of change for women.

Health risk in child bearing is a common risk among all women. The VBAs and VCHWs in the coastal region stated that the information they had received on family planning had caused changes in their community. Many VBAs and VCHWs regretted having larger families (mostly seven to 10 children) prior to receiving information on family planning. The VBAs and VCHWs admitted that many women in their community looked much ‘younger and stronger’ due to family planning and having children three to four years apart. Contemporary family planning methods—such as
pills, injections and intrauterine devices—have been used by many women. Many women still use traditional methods or herbs for contraception, while vasectomy is becoming increasingly popular in parts of the country, such as in Goroka in the highlands region of PNG (Eastern Highlands Provincial Health Authority, 2013). Although these contraceptive methods are popular, certain religious denominations (such as the Catholic Church) do not support their use. The VBAs described the restricted use of contraceptives by the Catholic women seen to contribute to large family size and close spacing of children. Restrictions on family planning are also imposed by other religions, such as Apostolic churches, mainly in Sub-Saharan Africa (Yeatman & Trinitapoli, 2008), while religions such as Islam and Protestants churches support family planning.

While religious beliefs may contribute towards acceptance or non-acceptance of contraceptives, other factors—such as educational level, economic situation, literacy, urban and rural disparity, lack of opportunities and lack of information on family planning—all influence family size decision making (Rasooly, Ali, Brown & Noormal, 2015). VBAs in this study, especially in the coastal communities, appreciated that family planning assisted in preventing unplanned pregnancy and controlling family size, and subsequently encouraged women in the community to plan their family size.

8.8 Validity

The key approach to ensuring the trustworthiness of this study was to produce data that were credible, dependable, conformable and transferable (Richardson-Tench et al., 2011). The following sections outline the approaches undertaken to maintain rigorous data and enhance the validity and reliability of this study.
8.8.1 Transferability.

Transferability refers to the possibility of transferring or applying the same methodological approach to a similar context or group of participants (Soulé, 2014). The interview guide (three stakeholder groups) design and approaches to examine the strengths and weaknesses of the curriculum and stakeholders were triangulated to enhance rigour. The methodology and results can be transferred to similar studies in the same context, such as the Pacific region, by using the same approach.

8.8.2 Credibility.

Credibility is achieved when stakeholders in a study recognise the findings of the study as real, and have been in contact with the investigated phenomenon (Richardson-Tench et al., 2011). The credibility in this study derived from the information provided by the VBAs and VCHWs in relation to the training conducted in the community setting. This research’s supervisory committee checked and established member agreement on the major themes and subthemes from all phases in this study. A limitation was the inability to undertake participant member data confirmation for the focus groups and postnatal women due to time and AusAid budgetary constraints.

Credibility in the triangulated data was also apparent with the triangulated them from the stakeholders linking to the curriculum mapping (Chapter 4) and in the similarities and agreements in the data when triangulated (see Table 8.1). For data to show evidence of rigour, the findings must be seen to represent the truth (Silverman, 2013). In this case, the literature indicated similar findings in other studies conducted in other low-resource countries facing similar problems and situations to the VBA training.

8.8.3 Conformability.
Conformability describes the neutrality and consistency in the interpretation and analysis of information in the data (Soulé, 2014). Conformability was used during the analysis of the information obtained from the stakeholders in the last three phases, obtained via consistency, piloting and content validity member checking. The findings related to other findings in similar contexts (low resource) and circumstances (VBA training).

8.8.4 Dependability.

The piloted and content-validated interview guides used in this study produced appropriate information from the focus group discussion and face-to-face interviews. The audio recorder captured the conversations, thereby enabling data storage that could be revisited to demonstrate dependability. The use of the audio recorder in the remote locations to record exactly what the stakeholders testified became an appropriate technology to use in this study with large groups, such as focus group discussions. It provides an avenue to produce similar findings if study replication occurs (Richardson-Tench et al., 2011).

8.9 Limitations

Conducting research in resource-poor settings has many limitations, yet it is contended that these results provide rich contextual data for a unique setting in a unique time of PNG’s history, and have benefits for new initiatives in evidence-based practice to lead to improved maternal and infant health outcomes (MDGs 4 and 5). There were a number of limitations noted in the audit trail, including geographical locations and transport access resulting in complicated data collection. The main limitations noted in the study related to mapping the BCMCH curriculum, complexities in accessing participants (University A’s BCMCH graduates, VBAs/VCHWs and postnatal women) and minor variance. These limitations are now examined and discussed.
8.9.1 University A’s BCMCH curriculum.

Systematic program evaluation is much more complex than curriculum mapping and analysis (Chapter 4). This study took a modified approach, partly due to the absence of documentation in University A’s curriculum of certain mapping requirements. University A’s BCMCH was a unique program and the first of its kind to be implemented in PNG. This meant that an outcome-based program evaluation needed to be conducted when graduates had been practising for a few years rather than longer period. A comprehensive evaluation at that time would have given more comprehensive overview with multiple stakeholders’ perspectives on the strengths and weaknesses of the program. This would have enabled identification of University A’s BCMCH’s suitability for PNG, with its diverse health problems and geo-political landscape, apart from only focusing on the strategies applied to prevent maternal and infant mortality indicators, especially increasing skilled birth attendants (WHO, 2013c).

A number of limitations exist in respect to conducting a modified program evaluation. These were chiefly that the University A’s BCMCH curriculum was limited by the lack of established national nursing competency framework, and the lack of established PNG national university graduate expectations that the curriculum tool used could be measured against as a requirement for the educational program evaluation. The BCMCH curriculum mapping was therefore only used PNG Midwifery and Child Health Competency Standards to be mapped against Curtin University mapping tool (Curtin University, nd) on the learning outcomes, assessments, experiences and resources. Mapping nursing curriculums in high-resource countries draws on more extensive national and professional standards and priorities to enable a through representative and alignment to national and global health issues and expected outcomes applicable to their countries’ health workforce and university graduate competencies.
Further limitations were University A’s BCMCH VBA module for the community practicum, which differed to traditional health centre practice for midwives and general nurses in PNG. However, this thesis found that many changes occurred in the stakeholders’ health behaviours, both in terms of health seeking and health risk avoidance, both personally and professionally. The graduates identified the importance of community practice and having training in communities to enable village-based understanding of those at risk and identify their health needs. The graduates commented that, if they had been placed at the health centre, they would have limited knowledge of the origin of health problems, as well as the everyday situations and real difficulties faced by women and their families.

8.9.2 Addressing subjectivity.

Subjectivity refers to experience, exposure, involvement and manipulation of the researcher to produce intentional or unintentional bias in the study (Jootun, McGhee & Marland, 2009; Silverman, 2006). Reflexivity improves data reliability (Jootun et al., 2009); thus, the current researcher observed and avoided having any influence on the stakeholders under study during all phases in order to lessen subjective bias in the overall research process, including data collection, transcribing and analysis (Jootun et al., 2009; McNeill & Chapman, 2005).

In the current study, the primary researcher was a previous lecturer and coordinator of University A’s BCMCH program; thus, it is possible that bias may have existed in the graduate interviews, given that the primary researcher conducted these interviews, and the participants were known to the researcher. The researcher had been a educational manager at university A when the BCMCH curriculum had been in place (2006-2009). In this case, imbalanced power relationship can exist between the researcher and participants, in which participants say what they anticipate the researcher
wants to hear, and leave out the context and nature of any negative experiences that might disrupt the relationship leading to biased data (McNeill & Chapman, 2005). In order to lessen the potential bias, the participants were clearly encouraged to openly express their thoughts regarding University A’s education program, and were prompted, probed and encouraged to share their experience. The primary researcher took field notes after each interview to reflect on the experiences and possible areas of her influence. In the subsequent Phases 3 and 4, the researcher was unknown to the participants, which reduced subjective researcher bias. The convergent and divergent themes further helped lessen subjectively by imposing triangulation rigour.

In addition, the sole focus on University A’s BCMCH curriculum might indicate a selection bias, given that a similar program was offered in two other universities in PNG. However the unique rationale for selecting University A’s BCMCH program was that the focus was solely on the seven embedded modules pertaining to the transfer of knowledge and clinical skills to VBAs and VCHWs, whereas the two other universities offering maternal and child health curriculum in the same period did not have this, as indicated in Chapter 3.

**8.9.3 Complexities in data collection.**

Ethical approval is crucial to ensure no harm occurs to potentially vulnerable populations, especially among rural PNG villagers, by ensuring the confidentiality and anonymity of the data and participants. While RMIT Human Ethics Committee approval was received, further ethical approval was needed from the PNGMRAC, which was time consuming, especially when the committee did not meet as per scheduled, which caused a delay of up to six months. Another delay resulted from having to submit the proposal to the PNGMRAC a second time when told that the earlier submitted proposal had been misplaced.
In addition, there are always complexities in data collection when many different groups are involved and approaches undertaken. This was particularly the case in this study when accessing participants in remote areas with difficult modes of travel. Many hours were spent walking to reach data collection site over mountainous terrains, or awaiting transport to ride for four to six hours. Further, the researcher’s security was an issue in certain parts of PNG, especially during the local government elections in 2013. However, good community negotiation and involvement ensured safety, especially due to knowing the background of the people and involving the locals in escorting the researcher to the data collection sites.

In respect to Phase 2, a limitation may have derived from not having access to the total sample of all 105 University A BCMCH graduates from the five years of the program because many of these graduates had moved to different employment locations. However, the final sample of 16 graduates was able to achieve thematic saturation. Although 20 BCMCH graduates were recruited, data saturation was reached at only 16 interviewees, with a saturation comprising similar response to what they had taught to VBA/VCHW, their views on the importance of community practice, more repeated case study as preferred assessment and recommendation about extending the program and bringing it back on board’, as reported in Chapter 5.

An additional stakeholder limitation was the use of English language for the BCMCH graduate interviews, as this appeared to pose a barrier that was not identified during the pilot study. Given that nurses in the PNG health setting traditionally use PNG’s national language of Pidgin for daily communication, the use of English may have limited the in-depth richness of their narrative, or may have prohibited nurses from taking part in the study.
In respect to limitations when sampling and interviewing the VBAs/VCHWs, it is possible that having two groups from the highlands and one group from a coastal region might indicate gaps in thematic saturation, and concerns with maintaining heterogeneity in respect to the contextual information. Transportation and participant access posed difficulties in reaching more groups, which could only be accessed by lengthy walks (up and down mountain terrains, through mudslides and rain) due to lack of road transport. The hardest to reach and those most in need may have been excluded due to time constraints and climate and geographical difficulties for accessibility.

Further, the relatively large size of the FGP (seven people per group) meant that some members spoke less frequently, while more confident members often dominated. However, the researcher did attempt whenever possible to ensure that everyone had the chance to state their opinions about each topic of discussion.

For the VBAs and VCHWs, the training in the rural communities focused on issues relating to women and children; thus, fewer male VBAs/VCHWs participated in the FGP, which may be seen as an imbalance of female participants dominating the discussion. However, gender, language, marital status and educational background were not the purposive criterion for recruitment to the focus groups. The involvement of two male VBAs/VCHWs was seen as breaking the women-oriented culture, with the female VBA participants acknowledging their male counterparts’ support when dealing with childbirth or arranging referrals in the community.

**8.9.4 Data variance.**

Data variance was mostly noted in the fourth phase of the study. Phase 4 with the postnatal women was a small convenience sample of women who had delivered with assistance from the University A-trained VBAs when they were unable to reach a health facility. The information obtained from these postnatal women showed only
partial saturation, as full accounts of the care and advice given during the antenatal period were not sufficiently provided during the interviews, and there was insufficient time to follow this up due to time and budget constraints. The incomplete and semi-saturated data were possibly due to postnatal women not being clear about the exact role played by VBAs and VCHWs in the community. Further, it was later found that some of these postnatal women were married and living in another community, with no exposure to VBA and VCHW training, and only returning to their paternal or maternal homes (where the VBAs and VCHWs attended) to deliver their babies.

Another variance found in the data was from the teenage postnatal women, who did not wish to reveal their true ages—most likely due to anecdotal reports of stigma from other villagers relating to their age and non-married status. As such, they were reluctant to discuss their reasons for delivering in the village. Their testimonies contradicted the theme of ‘not having any problems or complications in childbirth’, in opposition to what the VBAs and VCHWs testified. These differences in the data, when transcribed, could lead to inconsistence and limitations, which could create false gaps regarding knowledge and skills transfer, especially when the data were triangulated and when identifying convergent and divergent themes.

Despite these limitations, sufficient thematic saturation in the stakeholder groups was achieved, which indicated that this research provides a rich and thick descriptive ethnographic account of the development of PNG’s higher education curriculum reform.

8.10 Summary

This discussion chapter of the four-phase exploratory study examined the strengths and weaknesses in transferring knowledge and clinical skills from PNG University A’s BCMCH program to the stakeholders (BCMCH graduates, VBAs, VCHWs and postnatal women). This chapter examined the themes of convergence and
divergence, and provided a comparison and contrast of this study with the existing international and WHO literature. In alignment with the international and regional research undertaken in low-resource countries, the current study found that, despite numerous initiatives in providing improved care to reduce maternal and infant mortality, many women still opt to deliver in their village with the aid of VBAs.

The appropriateness and sufficiency of University A’s BCMCH curriculum to meet the needs of the MDGs (WHO, 2002) and key health priorities of the PNG health sector (Chapter 1) were examined through identifying convergent and divergent data. The thematic analysis of the convergence and divergence of each phase found that, with adequate support from PNG policymakers, the National Department of Health and the OHE, sufficient knowledge and skills could be maintained and sustained to improve the health outcomes of women and children in remote rural communities—the original aim of University A’s program.

University A’s program conducted rural community practice to train VBAs and VCHWs to identify risk factors in women and children, and make early referrals to the nearest healthcare facility. In addition, the training extended to conducting situation analysis and identifying public health problems in the community. University A’s BCMCH students then initiated education to eradicate disease and illness by providing evidence-based education and training, such as education on healthy living and initiating healthy homes programs, which aimed to eradicate preventable diseases, such as malaria, pneumonia and diarrhoeal diseases. For many decades, PNG has conducted health education programs to provide safe and timely care for women and children via health facilities. However, University A’s BCMCH rural practice was the first ever program conducted onsite in the villages where the majority of women and children reside.
Providing appropriate care for these postnatal women who face difficulty reaching health facilities for childbirth requires that VBAs be supported through monitoring and up-skilling, as well as providing sustainable monetary support to help VBAs refer at-risk women and children to health facilities.
Chapter 9: Conclusion and Recommendations

9.1 Introduction

This concluding chapter first restates the aims and research questions of this study, in line with the WHO Global MDGs, on public health initiatives for low- and medium-income countries—particularly those related to maternal and child health promotion and intervention. The MDGs were in place when University A’s BCMCH program was commenced in 2005, and lasted until the study was completed in 2015. It is of note here that, in September 2015, the United Nations introduced Sustainable Development Goals (SDGs), proposing 17 goals and 159 targets for a 15-year period (2015 to 2030). Among these 17 goals is the goal that replaces MDGs 4 and 5—SDG 3, which seeks to ensure healthy lives and promote wellbeing for all ages by reducing maternal, newborn and child mortality, including eliminating preventable diseases and endemics (United Nations Department of Economic and Social Affairs, 2015).

As the MDGs are drawing to an end, when this study and the program was conducted (2005 to 2015) the current study also notes the targets in the WHO SDGs goals to include 15 years (2015 to 2030) maternal and child health would enable the implementation of the proposed recommendation this chapter will provide (Silver & Singer, 2014).

This chapter then goes on to present a summary of this study’s key findings, drawing together the analysis and discussion presented in the previous chapters to inform recommendations. The implications and recommendations focus on PNG health policy, and curriculum development and education of maternal and child health nurses, VBAs and VCHWs to meet the needs of the PNG community although improvements are currently underway in upskilling of midwives through midwifery education. The recommendations include directions for further studies of a rurally-oriented maternal
and child health curriculum that would include all PNG’s KRAs (Government of PNG, 2010a) and aim to reach the rural majority and urban disadvantaged by providing accessible, affordable, acceptable and quality healthcare (WHO, 2014b).

9.2 Aims

The purpose of this study was to examine the strengths and weaknesses of University A’s BCMCH initiative, which was designed to meet the WHO Global MDGs. University A’s BCMCH was developed in 2004 to prepare specialist nurses to undertake a clinical role in implementing strategies to meet the targets to reach remote rural and urban disadvantaged communities. A specific emphasis was on rural and remote maternal and infant health promotion and interventions—that is, transferring midwifery and child health knowledge and clinical skills from BCMCH students to three stakeholder groups (VBAs, VCHWs and postnatal women). Therefore, the aims of the study were:

- to enhance the previous University A’s BCMCH based on empirical data to inform the potential implementation of a new higher degree course that is educationally and culturally relevant to PNG universities
- to provide empirical data for the PNG Department of Health on a new model for maternal and child health graduates for remote rural health communities
- to better inform an educational knowledge and skills transfer based on sustainable and relevant partnerships with key stakeholders
- to critically evaluate the perceived strengths and weaknesses in the transfer of knowledge and skills to stakeholders (BCMCH nurses, VBAs and VCHWs).

This four-phase study critically evaluated the perceived strengths and weaknesses in the transfer of knowledge and clinical skills from multiple stakeholders.
(BCMCH graduates, VBAs, VCHWs and postnatal women) in order to address the following questions:

- What were the strengths of the previous educational module that was used to inform the training of the BCMCH student?
- What were the weaknesses of the previous educational module that was used to inform the training of the BCMCH student?
- What were the perceived strengths of the transfer of knowledge and skills to VBAs and VCHWs?
- What were the perceived weaknesses in the transfer of knowledge and skills to VBAs and VCHWs?
- What were the perceptions of the postnatal women regarding VBA training?
- What were the convergent and divergent themes identified from the different phases of the study?

The main themes from all stakeholder groups were tabulated and discussed based on convergent and divergent themes (Chapter 8) in order to address the research questions. This indicated much strength in the BCMCH program knowledge and clinical skills transfer, and a number of limitations. An important discrepancy of University A’s BCMCH curriculum identified by the stakeholders was that it was implemented in a short period and with limited resources, which resulted in adverse effects on the related stakeholders’ (graduates, VBAs and VCHWs) educational learning and clinical practice. The summary of these findings highlights the major strengths and weaknesses identified in the transfer of knowledge and clinical skills to the stakeholder groups.
9.3 Summary of Findings

Education in general is widely acknowledged to be a major contributor to improving the health literacy and health outcome of a given population (Karlsen, et.al, 2011). Health is commonly measured in low-resource countries by a reduction in the burden of disease and disability-adjusted life years, underscored by improvement in the social determinants (see Chapter 1) of the economic and social prosperity of a given nation. This summary of findings provides insight to the strengths and weaknesses of University A’s BCMCH curriculum knowledge and skills transfer from all stakeholder groups. It also outlines the program evaluation findings of the perceived benefits of the education of the stakeholders involved in the study. One such strength was the reflective community assessment, which was a new approach undertaken in rural community practice.

In addition, this section summarises the weaknesses were identified and went on to inform recommendations for a new Maternal and Child Health (MCH) programme. These recommendations are in three main target sectors to suggest how PNG’s healthcare policies, tertiary sector education and health services can be adapted to align with the new SDGs for 2015 to 2030. This chapter concludes with these recommendations to include in future programs.

9.3.1 Strengths in knowledge and clinical skills transfer.

The transfer of curriculum knowledge and clinical skills from University A’s BCMCH curriculum to the participants in Phases 2, 3 and 4 was perceived to initiate positive changes in health knowledge, clinical skills uptake, health promotion, community education, and more personalised and effective birth outcomes. The evaluation of University A’s BCMCH program produced rich in-depth contextual evidence of higher education knowledge and clinical skills transfer to VBAs and
VCHWs, which was perceived by the stakeholders to have contributed to reducing maternal and infant mortality in PNG’s rural communities. At that time, the key priorities for PNG’s National Department of Health were fulfilling MDGs 4 and 5.

The literature review indicated that previous international attempts at TBA and VBA training had not been ideal as a number of key maternal and infant health needs had not been addressed (World Bank, 2012). Similarly, the current study identified structural, organisational and inter-professional problems with sustaining and up-skilling PNG’s VBAs and VCHWs with robust knowledge and clinical skills. The VBAs’ and VCHWs’ improved birthing and child health knowledge and skills from the BCMCH program was evidenced by their perceived ability to provide safer maternal and child health outcomes. Of central importance to the findings was that PNG nurses and other healthcare professionals needed to recognise and work in partnership with PNG’s rural communities to enable better maternal and infant health outcomes.

The increased morbidity and mortality currently occurring in mothers and infants include deaths from preventable diseases, which are mainly due to a lack of timely care, referrals to hospital, transportation difficulties and a paucity of clinical resources and infrastructure. This modified MCH program evaluation indicated that theoretical knowledge and clinical skills can be transferred to a community, particularly through sustained community placement. University A’s BCMCH graduates witnessed the importance of bringing the service closer to the community through education and placements in rural health outposts, or through training VBAs and VCHWs to create avenues for partnership in health service provision.

The specifically identified strengths of University A’s maternal and child health program included the changes made to the clinical practice of the graduate nursing professionals. Of importance to all stakeholders were the professional and personal
changes that this new and more directly targeted curriculum created. Many of the BCMCH graduates testified to changes in their attitudes and behaviour towards clients as a result of the remote rural clinical placement and knowledge of the VBA and VCHW training. The remote rural community practice was a considerable departure from previous student placements at health centres.

The perceived transfer of knowledge from University A’s BCMCH educational curriculum that arose from the curriculum mapping and graduate testimonies (regarding community-based learning) enabled the graduates to identify health-related problems that they would have missed if not had such a programme and the associated community placement. The seven units on community rural/urban maternal and child health education and promotion (Chapter 3) with an embedded focus on VBA/VCHW up-skilling was identified as enabling students to plan and implement strategies to improve the lifestyle of rural remote the communities. The fact that graduates lived and worked with the people in the villages and participated in their daily life overtime gave the community the confidence and trust needed to reveal their hidden concerns. New knowledge learnt from the community placement regarding sexual and reproductive health issues, such as STIs, in particular HIV was put into practice due to long-term engagement and establishing rapport in the villages. The graduates admitted that knowledge taught about sexual and reproductive health, HIV and family planning had broadened their understanding of the health risks of people in rural remote communities. This resulted in a perceived reduction of sexual and reproductive risk behaviours, and increase in community members’ health-seeking behaviours—particularly seeking early healthcare when required.

This transfer of knowledge and skills taught by University A’s BCMCH students converged with that from the Phase 4 data, with postnatal women testifying that the
BCMCH-educated healthcare workers (VBAs and VCHWs) provided conducive, client-focused practice. The postnatal mothers testified to witnessing the effect of the ‘healthy homes’ project on enabling better preparation for their baby’s birth, and the timely care and support they had received, especially during childbirth. This occurred as a direct result of the BCMCH graduate nurses’ community placement and training of semi-skilled VBAs and VCHWs. The involvement and education of the VBAs and VCHWs was also perceived by the graduates to counteract the workforce shortage in remote rural areas, where clinical maternal and infant care was optimised for a more targeted approach through community partnerships.

Another convergent multiple stakeholder theme was the transfer of knowledge related to the ‘healthy homes’ projects. The BCMCH education of VBAs helped recognise the misconceptions that sorcery and witchcraft were responsible for adverse birth outcomes. The village mothers acknowledged the benefit of receiving evidence-based information about their own health and prevention of diseases.

9.3.2 Benefits of acquired knowledge and skills.

The interviewed VBAs and VCHWs testified to the benefits of learning skills from the BCMCH students in perinatal prevention of injury, with a specific focus on early recognition of mothers at risk and management of high-risk factors. The VBAs testified to gaining new knowledge focused on evidence-based chains of events, associated with signs and symptoms that occur during the ‘mechanism of labour’ (Chapter 6), such as observing the ‘head on view’ prior to asking birthing women to ‘push the baby out’. The BCMCH curriculum content on birthing preparation and procedures was found to have transferred to the VBAs and VCHWs through watching demonstrations to reinforce learning. For the VBAs and VCHWs, the birthing procedures and preparations, as well as the indications that women were ready to
deliver, constituted new knowledge, as opposed to historical beliefs that any pain indicated that the birthing woman should start pushing to expel her baby.

Additionally, the VBAs and VCHWs also stated that they were now able to clinically identify babies who were sick, and could tell the difference between those who were ‘just sick’ and ‘very sick’. This knowledge enabled the VBAs and VCHWs to make timely referrals. Therefore, the knowledge and skills transferred between the BCMCH students and village health workers created a platform for improved maternal and infant mortality outcomes. In addition, in response to their new skills, the BCMCH graduates believed that they could now perform specific skills with confidence, such as manual removal of a retained placenta; delivery of twins, triplets and breech births; and follow HIV protocols to deliver HIV-negative babies.

For some graduates, applying this new knowledge in their postgraduate employment was impeded due to their previous job descriptions and designated postgraduate employment location. For example, stakeholders in Phase 2 stated that they were employed post-graduation in antenatal clinics, child outpatient clinics or management positions dealing with administrative responsibilities. The graduate destination employment demographic data showed that many BCMCH graduates were offered careers in either the educational sector as lecturers and tutors, or in the clinical setting as managers, supervisors or team leaders due to the higher degree they had completed (Chapter 5). The work allocations encountered in their post-graduation employment prompted these nurse graduates to testify to wanting an additional module in management and leadership. Placing most of the graduates in administrative or teaching positions leaves a vacancy for a skilled workforce in areas of critical maternal and child needs, such as rural community health centres, rural labour wards and children’s wards.
9.3.3 Importance of reflective assessment.

Another major strength identified in Phases 1 and 2 was use of reflective assessment for the purpose of identifying whether knowledge and skills were passed onto VBAs and VCHWs during the community practice component through using return-demonstration. This demonstration consisted of oral questions regarding procedures such as preparing birthing equipment, in which clean birthing kits were displayed and questions were asked regarding the use and purpose of these. The successful performance of these reflective assessments indicated effectiveness of the knowledge and skills passed to the recipients (VBAs and VCHWs). The testimonies on the knowledge and skills received were critiqued further in Chapter 6 to reflect the successful transfer of knowledge and skills.

The formal assessment of the BCMCH students consisted of a variety of approaches. In Phase 2, the means of assessment that was seen as the most able for learning was the case study on high-risk planning. For example, in the current research, conducting additional focus group interviews with community members apart from the VBAs, VCHWs and postnatal women would have given a broader view more inclusive of the multiple stakeholders of the implementation of community practice by University A’s students.

9.3.4 Weaknesses of the knowledge and skills transfer.

University A’s BCMCH curriculum and remote rural placement not only promoted positive outcomes for stakeholders, but also raised a number of concerns. In particular, the students highlighted the paucity of clinical resources, such as clean birthing kits, for the VBAs to continue clean birthing practice during emergencies. The 16 modules (Chapter 4) taught during University A’s BCMCH were seen to be generally relevant for both the midwifery and child health strand; however, sustained
planning and key education textbooks, mannequins and medical teaching resources were needed to gain the full benefits of the curriculum. The acknowledged lack of equipment and learning resources—such as mannequins for stimulated learning, textbooks and computers to access data—posed a significant concern. However, the hands-on practice in the hospital and community clinical setting was seen to be of considerable value.

Another recognised limitation in the perceived educational outcomes of the curriculum delivered to the end stakeholders (rural women) was the lack of funding for VBA work, and to facilitate patient transport and mobile telephones to connect to urban health services. In PNG, where the rural majority depend on farm-based enterprises, it is unrealistic to expect communities to have adequate financial support to access healthcare in town health facilities.

The BCMCH graduates further stated that a limitation in the education related to the inability to extend the training of the VBAs and VCHWs in their provinces. In PNG, health workforce employment is allocated according to funded positions, which does not provide flexibility for nurses to work in emerging and critical areas of health need and rural/remote locations. For example, nurses attached to a hospital-funded position can only serve upon graduation in their previous hospital, and not participate in rural health service programs.

9.4 Recommendations for Policy Changes

Based on the data from the three stakeholder groups, this section provides recommendations of improvements that should be made to enable the effective transfer of knowledge and skills to improve maternal and infant health outcomes. The curriculum mapping and stakeholder interviews highlighted many strengths and weaknesses, which inform recommendations for PNG health policy, tertiary education
curriculum development and health services to target future nursing and health workforce planning.

In addressing the research questions, this modified program evaluation design found that the implementation of University A’s BCMCH produced evidence of merit (quality) and significance (Koplan, 1999; Owens, 2006) in addressing PNG’s KRAs and National Development Goals as well as the WHOs MDGs 4 and 5 (Chapter 1). The focus of this research was on the importance of providing safe maternal and child health care to the rural majority—particularly the most vulnerable to enable accessible, affordable and acceptable healthcare. To develop consultative, sustainable policy, it is important that policy developers, education implementers and health service providers work in partnership with health service recipients. This must be ensured with sustained financial support and inbuilt regular process and outcome evaluations. While recognising the significant maternal and child health outcomes gained from the previous University A’s BCMCH program, the stakeholders in this study also made many recommendations for policy improvement, as follows.

9.4.1 Consultative policy.

In PNG, as elsewhere, health and education policy initiatives are developed to respond to the unique and specific needs of the country. Policy development must be supported with sustainable evaluation and ongoing financial commitment; however a major flaw in the current policies for MCH and VBA/VCHW training was the lacking of regular evaluation and on program and inbuilt sustainable funding. Thus, this study recommends that the PNG health sector have a 10-year policy plan when implementing any higher degree accredited health service programs, with ongoing long- and short-term evaluation components. This is particularly significant when targeting remote rural maternal and infant healthcare recipients.
Of critical importance to policy implementation is that the end recipients take ownership of the program. Such as initiative colloquially termed ‘seeing it bear fruit’ was suggested by VBAs and VCHWs. This study recommends the development of a sustainable rurally-focused community health program with prioritised entry for nurses employed in rural health facilities, in line with the proposed SDGs targeting maternal, newborn and child health. Another recommendation is to increase PNGs current rural financial hardship allowances to attract more nurses to work in rural community posts. These initiatives would align with the 2009 PNG health policy developed in Goroka for community health posts to be established under the mandate of a ‘going back to basics’ approach, and having skilled attendants at each community post (National Department of Health, 2013).

The data derived from this thesis indicates that a bottom-up approach is needed for new maternal and child health tertiary education, and education for VBAs and VCHWs from the village upwards. To ensure that funded projects are beneficial and reaching end users, it is critical to involve the community in the monitoring and outcome evaluation particularly the community leaders.

9.4.2 Policy for program development and evaluation.

Historically in PNG, many government policies have been developed without ensuring adequate consultations and planning to benefit end users by listening to their needs (Razee et al., 2012). One classic example is the policy informing educational nursing programs in PNG. Many nursing educational programs are targeted at improving the knowledge and skills of healthcare professionals for safe care delivery at health facilities. However, little evaluation has occurred on the chain of stakeholders involved in the delivery of the care, such as practising nurses post-graduation. Policy
regarding program evaluation needs to encompass both formative and summative outcome targets for the purpose of improvement.

Therefore, the PNG health sector needs to have a 10-year plan for the implementation of any higher education, especially if offered for the first time—such as the studied maternal and child health education program. Recommended short-term progress evaluations should be made every three years. Policy needs to mandate a program evaluation framework, especially for public health programs (Koplan, 1999), to guide evaluation, and needs to provide funding for ongoing process and outcome evaluations of all allied health educational programs.

Further, the Nursing Council of PNG needs to develop a competency-based framework for any new programs developed. This is so that licensing and registration is not delayed, as caused by the lack of appropriate registration for BCMCH maternal and child health graduates in the current study. A further recommendation is that, if the previous maternal and child program is to be redeveloped with changes that align with this thesis’s major recommendations. The curriculum must contain competencies that can be achieved in the rural health facility and community setting, such as situational analysis, health promotion, and VBA and VCHW training. A clear achievable assessment criterion for all stakeholders must also be included to provide evidence of learning outcomes.

9.4.3 Education and curriculum development.

The PNG nursing education sector has historically used a traditional colonial-informed medical model to develop nursing curriculums, with little contributions from allied stakeholders. A carefully planned educational program would considerably inform the long-term health goals and policies of the country. This study also recommends developing a national higher education curriculum that targets all
stakeholders (student nurses, VBAs, VCHWs and women) at the community level. Of importance is that the level of funding to be increased for university maternal and child health programmes with rural component. These programmes would have the substantial inclusion of components of VBA, VCHW education HIV/AIDS, health education and promotion in maternal and child health issues and rural community practice embedded into the curriculum.

Another recommended inclusion in a new maternal and child health curriculum is a module on basic adult teaching and assessment style. The interviewed graduates found that they needed to be taught basic teaching and assessment methods for use during clinical mentoring, classroom teaching and health education in the community. Depending on their location of employment, the graduates also found that some skills were not taught in detail, such as undertaking lumber puncture for babies and children, neonatal resuscitation, research proposal writing skills and palliative skills. These need to be taught in detail for application to clinical practice.

Another particularly important module is project management to undertake nursing responsibilities in rural communities and how to initiate small public health community projects. This study particularly recommends a component on health entrepreneurship/management that would enable initiation of small-scale self-help projects to empower VBAs and VCHWs to provide income and money for referrals (transportation). The VBAs, VCHWs and postnatal women testified to difficulties encountered financially when mothers and babies were referred to healthcare facilities.

The addition of extra modules to the previous 16 embedded modules suggests that the new national MCH curriculum needs to have an extended time frame of more than two years, including the previous community practice practicum. This study also recommends including increased university learning resources (such as textbooks and
simulation equipment) and increased clinical resources (such as blood pressure
drugs and baby measuring scales) to enhance learning. The modified rural
community practicum component could also be undertaken by other postgraduate
students undertaking midwifery and paediatric studies with an national emphasis on
saving the lives of mothers and babies in low-resource settings.

Many of PNG’s current tertiary nursing curriculums have hospital-based training
and practice, with minimal focus on community engagement during health promotion
and education. Thus, universities must consider a curriculum with a unique remote and
rural public health and maternal and child health focus. This would include in-depth
evidence-based curriculum strands on safe motherhood and associated midwifery
practice, childhood infection and diseases, the social determinates of disease, the
promotion and prevention of diseases across the lifespan, VBA and VCHW education,
rural and remote feedback, and return evaluation assessment.

University A’s 2005 to 2009 BCMCH curriculum was unique in the history of
PNG’s nursing education service curriculums, when compared with the previous two
decades of PNG midwifery, child health, mental health and acute care nursing
curriculums. These previous curriculums tended to be largely hospital focused, and
targeted healthcare predominantly towards the urban residents who were able to reach
these services. Thus, a rural community-oriented curriculum would benefit the
unreached and disadvantaged as seen in University A modified programme evaluation
outcome.

From the feedback provided by the BCMCH graduates, this study strongly
recommends that any BCMCH curriculum continue case study assessments, as these
improved both clinical practice and knowledge about planning care for high-risk clinical
conditions. In addition, the participants viewed the case study assessment as being able
to instil confidence in public speaking; thus, this study recommends that the curriculum include more clinical case studies in which students are required to present.

Further, in respect to assessments and feedback for the community practice component, the student BCMCH nurses and VBAs and VCHWs were given the opportunity to demonstrate their acquisition of knowledge and skills. The graduates recommended that this feedback be provided by community leaders and teachers to give an overview of the effect of the community practice on the community.

9.4.4 Health services.

As stated in Chapter 5, it is imperative that health services are brought into rural communities by improving the current curriculum and providing ongoing education to nurses in remote health settings. Also important is increasing the wages of nurses in community locations to make community settings more professionally desirable. This study also recommends improving rural and hospital clinical training facilities to enhance students’ learning in both midwifery and child health. In addition, equipping VBAs and VCHWs with sound education, skills, resources and financial support would enable targeted, localised and more responsive (to emergency reporting) community services, and bring health services closer to rural populations.

The graduates also testified to not having proper supervision at their allocated health and education facilities. Thus, this study recommends up-skilling clinical staff to have the appropriate knowledge and clinical skills to supervise the core competency levels required in rural health facilities, obstetrics and gynaecology units, and paediatric units. In addition, it is critical to include a regular compliance audit, overseeing the operational standards of safe practice of the potentially up-skilled VBAs and VCHWs. In addition, a regular in-service education needs to be organised by VBA trainers in collaboration with health facility staff, such as refresher courses for VBAs and VCHWs.
9.4.5 Providing accessible health services.

In PNG, with many health services currently either closed or functioning with limited resources (equipment, staff and pharmaceutical drugs), the focus of the health service needs to be on the consumers who most need healthcare, encompassing health promotion, healthy communities, and healthy mothers and babies. It is important to relocate health provision to locations where the most disadvantaged and high-risk mothers and children reside in PNG—the remote communities. All stakeholders recommended reintroducing a similar university-based maternal and child health education curriculum, with enhanced embedded VBA and VCHW modules for rural communities.

In respect to providing accessible and affordable health services, this study recommends revisiting the ‘waiting room’ project initiated by the WHO in 1998, and established in many regions of PNG (WHO, 1996). A waiting house was built at the health facility in each districts provide access to health for women with financial or geographical difficulty (lack of roads, cost of transport and distance) to await childbirth.

This study also recommends providing financial incentives to assist VBAs and VCHWs to escort and refer pregnant women and sick babies to enable safe health outcomes. Financial support has had a successful effect in other parts of the world, such as India and Africa (Pereira et al., 2015). Thus, the same approach is recommended to support PNG mothers and children. This study recommends that the PNG Health Department negotiate with other government sectors—such as provincial and local governments to seek information on how PNG village councillors were included in government a salary. A similar approach could be made for VBA and VCHW payment allocations to be included in the local government payroll for every referral undertaken in the local council ward of each district.
When recruiting nurses for new community posts, the National Department of Health has advocated for new health positions to be made available, thereby creating employment opportunities for maternal and child health graduates. A clear graduate job description for BCMCH needs to be established by the human resource division of the National Department of Health, supported by attractive terms and conditions of employment, especially hardship allowances. This will improve village mothers’ and babies’ access to timely, skilled healthcare at remote rural facilities.

9.4.6 Establishing effective partnerships with communities, VBAs and VCHWs.

The substantial communal tie created with the students in the rural community practicum and community members enabled VBA’s role to become more effective in previous studies, as outlined in Chapters 6, 7 and 8. This was evident when the VBAs and VCHWs stated that the villagers recognised their titles and status, which enabled them to encourage families to take unwell patients to the hospital. The postnatal women knew that if they were escorted to the hospital by the VBAs and VCHWs, their hospital waiting time would be reduced and they would receive priority care by a health worker or doctor. This study recommends for health facilities to have more effective communication with VBAs, VCHWs and other village-based health workers. Further recommendation would be the development of simple clear protocol guidelines for evacuation of medical emergencies and triaging priorities for VBA and VCHW. These might be in a form of a short checklist or mobile phone devise.

9.5 Recommendations for Future Studies

When a new national rural-based maternal and child health curriculum is developed to incorporate the recommendations from this study with evidence-based knowledge and clinical skills applicable for VBA and VCHW adult education and a
new community module—an intervention study is needed. The future intervention study test pre- and post-program knowledge clinical skills and satisfaction from the perspective of all stakeholders. Such a pre- and post-intervention study would evaluate changes in knowledge and attitudes, as well as qualitatively assessing the satisfaction of the associated stakeholders. A baseline study needs to be undertaken during the first year of study, and then post-graduation. This could be followed up by a three-year repeated measures testing with new graduates in their assigned communities.

9.6 Conclusion

University A’s BCMCH program implemented from 2005 to 2009 was perceived by the interviewed stakeholders to generally facilitate the sound transfer of educational knowledge and clinical skills from the BCMCH students to the VBAs and VCHWs, and ultimately to rural women and their children and communities. This was contended towards improving PNG’s escalating maternal and infant morbidity and mortality rates, although this study did not examine the direct linkages or association of cause and effect. Instead, it provided an in-depth examination of the complexities of educational curriculum knowledge and clinical skills transfer in a critical area of public health in a low-resource context. This study has captured an overview of the complexities of maternal and infant health education and service delivery in contemporary PNG including the effect of geographical terrain on accessing health services and the unmet need to timely emergency evacuation. This study also captured insight to the health workforce, health workforce sustainability, and context of rural and remote village women’s health-seeking behaviours. In addition, it highlighted the current accessibility to health services, especially for mothers and children.
University A’s BCMCH community education of VBAs and VCHWs was seen to assist those women who were unable to reach health facilities. More community-based services provided by an up-skilled health workforce (including VBAs and VCHWs), with protocols and procedures for timely care, would improve the health of remote and rural mothers and children (MDGs 4 and 5). This would address concerns raised on accessibility and involve the community (PNG KRA 1) to create partnerships with community stakeholders (PNG KRA 2). Meeting other PNG KRAs (Chapter 3) were seen in the reduction of disease by conducting situational analysis and initiating building proper toilets to prevent diarrhoeal diseases (KRA 6), as well as promoting a healthy lifestyle by introducing the ‘healthy homes’ program (KRA 7). KRA 8 was seen to be effectively addressed when there was an outbreak of cholera in 2009—particularly in the community where the graduates were sent for community practice. Due to prior community education in hand washing and food preparation, people in the community were able to prevent the further spread of disease.

Therefore, University A’s 2006 to 2009 BCMCH was seen by stakeholders as a contributing to improving the health of the remote rural PNG population, which was not isolated solely to improving the health of women and children. The strengths of the program indicated the importance of having a curriculum like the previous University A program; however, it should also include changes in terms of future program planning and implementation. It is critical that health services be driven by long-term policy and education workforce planning that aims to reach the most disadvantaged in the rural and remote parts of PNG in order to enable ‘accessible, affordable, acceptable and quality’ people-focused healthcare (WHO, 2014b).
References


Victoria Australia: Compass Women’s and Children’s Health Knowledge Hub, Burnet Institute Medical Research & World Vision Australia.


Appendices

Appendix 1: PNG Health Structure

Government of PNG—Minister for Health and HIV

PNG National Department of Health—Secretary for Health

Deputy Secretary—National Health Planning and Cooperate Services

Deputy Secretary—National Health Service and Standards

Office of Higher Education, Science and Technology

Executive Manager—Strategies Policy Division

Executive Manager—Cooperate Service Division

Executive Manager—Medical Standards Division

Executive Manager—Public Health Division

Department of Planning, Policy, Industrial Relations and Legal Cooperate Performance

Department of Finance, Human Resources, Infrastructure and Major System Commercial Support

Department of Clinical Standards, Health Facilities, Medical Standards and Health Sector

Department of Family Health, Emergency Preparedness and Response, Central Public Health, Health Promotion, Protection and Disease Control

Health Training and Education

Provincial Health Office

National and Provincial Hospitals

Churches’ Medical Council and Health Service

Rural Health

Sub-health Centres and Aid Post
Appendix 2a: Human Research Ethics Committee Approval from RMIT University’s CHEAN and PNGMRAC

30th July 2012

Eleanor Holroyd
Building 201 Level 6, Room 11
School of Health Sciences
RMIT University

Dear Eleanor

BSFIIAPP 32 – 12 HOLROYD A Maternal and Child Program Outcome

A Maternal and Child Program Outcome

Evaluative Study: Examining the Knowledge transfer of a targeted Village Birth Attendant Education in PNG

Thank you for submitting your amended application for review.

I am pleased to inform you that the CHEAN has approved your application for a period of 6 Months to January 2013 and your research may now proceed.

The CHEAN would like to remind you that:

All data should be stored on University Network systems. These systems provide high levels of manageable security and data integrity, can provide secure remote access, are backed up on a regular basis and can provide disaster recovery processes should a large scale incident occur. The use of portable devices such as CDs and memory sticks is invalid for archiving, data transport where necessary and for some works in progress.

The authoritative copy of all current data should reside on appropriate network systems; and the Principal Investigator is responsible for the retention and storage of the original data pertaining to the project for a minimum period of five years.

Annual reports are due during December for all research projects that have been approved by the College Human Ethics Advisory Network (CHEAN).

The necessary form can be found at: http://www.rmit.edu.au/governance/councils/hrec

Yours faithfully,

Phillip Maude
Acting Chair, Science Engineering & Health
College Human Ethics Advisory Network ‘B’

CC CHEAN Member: Margaret Leck School of Electrical & Computer Engineering RMIT University

Student Investigator: Jula Kambijambi Kep School of Health Sciences RMIT University

Other Investigator: Linds Joss School of Health Sciences RMIT University
Dear Mrs Kep,

This is to certify that the proposal:

"A Maternal and Child Health Program Outcome Evaluation Study: Examining the Knowledge transfer of a targeted Village Birth Attendant Education in PNG" submitted by you to the MRAC was discussed and deliberated on. However, MRAC resolved that your Explanatory statement for participants need to be translated to talkplain.

Otherwise, your research proposal has been examined by the Medical Research Advisory Committee of Papua New Guinea and assigned MRAC No. 12.28. The proposal was approved and given ethical clearance for it to be carried out in Papua New Guinea.

The Medical Research Advisory Committee of Papua New Guinea act as the National Ethical Clearance Committee and as the Institutional Ethical Committee for the Papua New Guinea Institute of Medical Research and so there is no further bar to this project being carried out in Papua New Guinea.

Investigators are reminded of the importance of keeping provincial health and research authorities informed about their study and its progress, and of submitting progress and outcome reports to the Medical Research Advisory Committee.

With best wishes.

Yours sincerely,

Mr. Ken Wai
Chairperson

SERVICE DELIVERY TO THE RURAL MAJORITY AND URBAN POOR
Appendix 2b: Request Letters and Approval from PNG Health Authorities for Access to Data Collection Settings

The Chairperson
Medical Research and Advisory committee
Department of Health
P.O.Box 807
Waigani, National Capital District.

Dear Sir/Madam

Subject – Seeking permission for data collection in PNG health settings

I Julie Kamblijambi Kep, a PhD candidate studying at RMIT university, Discipline of Nursing and Midwifery; School of health science Melbourne, would like to seek the committee’s approval to use the selected health setting within PNG for purpose of data collection.

The RMIT University Ethics Advisory Committee (CHEAN) after reviewing my application asked me to produce an approval letter from Medical Research Advisory committee and the Health setting giving the authority for me to use the setting for the purpose of data collection.

I have already written letters to CEOs and Health Advisors seeking their permission to the setting and the participants working within their health facilities (see attached letter) which is still pending. Attached for your information is a proposal on the scope of study which was submitted to RMIT Ethics Committee.

Provided are my contact details.
Mailing address: ____________________________
Email: ____________________________
Phone: ____________________________

Thank you,

Julie Kamblijambi Kep (Ms)
PhD Candidate
The Hospital Administrator
Kudjip Nazarene Hospital
Jiwaka Province

Dear Dr Dooley

Subject – Seeking permission for data collection statement at your hospital setting

I Julie Kamblijambi Kap, a PhD student currently studying at RMIT university, Discipline of Nursing and Midwifery: School of health science, Melbourne would like to seek your permission to use the hospital setting for purpose of data collection. The data for the purpose of the study will be collected on the graduates of the Bachelor Clinical Maternal and Child from Goroka University from 2006-2009 employed at your hospital.

The purpose of the study is to evaluate the strength and weakness of the perceived transfer of knowledge and skills to the village birth attendants and onto the postpartum women resulting from the University of Goroka, BCMCH 2005-2009 training. The process of investigation will involve face to face interviews will be conducted with a cohort of selected graduate who have provided informed consent. This will take place in a private room and takes approximately 30 mins.

The aim of the study is to rigorously evaluate the strength and weakness of previous program based on empirical data from the identified stakeholder. This knowledge will inform the potential implementation as new high degree course for PNG University with the Bachelor Maternal and child health as single strand

A secondary aim is to provide empirical data for the PNG Department of Health on a new clinical position for maternal and child health graduate through more sustainable and relevant partnership with community ultimately contributing to addressing maternal and infant morbidity and mortality. A copy of the completed work will be supplied to your organization for your reference upon completion of the thesis.

This is now pending approved by RMIT, SHE Research Ethics Committee

Provided are my contact details.
Mailing address:
Email: Phone:

Your support will be fully appreciated.
Thank you,

Julie Kamblijambi Kap (Ms)
PhD Candidate
Date: 13/06/12

Victoria, Australia

Dear Ms Kep,

Subject – Seeking Permission for Data Collection

The Hospital Administration Team had met and approved your request for Data Collection in Nazarene hospital.

Yours Faithfully,

Dr. Scott Dooley
Hospital Administrator
17th May, 2012

The Chief Executive Officer
Mendi General Hospital
Free Mail Bag
Mendi, Southern Highlands Province

Dear Mr Turian

Subject – Seeking permission for data collection statement at your hospital setting

I Julie Kambiljambi Kep, a PhD student currently studying at RMIT university, Discipline of Nursing and Midwifery, School of Health Science, Melbourne would like to seek your permission to use the hospital setting for purpose of data collection. The data for the purpose of the study will be collected on the graduates of the Bachelor Clinical Maternal and Child from Goroka University from 2006-2009 employed at your hospital.

The purpose of the study is to evaluate the strength and weakness of the perceived transfer of knowledge and skills to the village birth attendants and onto the postpartum women resulting from the University of Goroka, BCMCH 2005-2009 training. The process of investigation will involve face to face interviews will be conducted with a cohort of selected graduate who have provided informed consent. This will take place in a private room and takes approximately 30 mins.

The aim of the study is to rigorously evaluate the strength and weakness of previous program based on empirical data from the identified stakeholder. This knowledge will inform the potential implementation as new high degree course for PNG University with the Bachelor Maternal and Child Health as single strand.

A secondary aim is to provide empirical data for the PNG Department of Health on a new clinical position for maternal and child health graduate through more sustainable and relevant partnership with community ultimately contributing to addressing maternal and infant morbidity and mortality. A copy of the completed work will be supplied to your organization for your reference upon completion of the thesis.

This is now pending approved by RMIT, SHE Research Ethics Committee

Provided are my contact details.
Mailing address:
Email ____________________________ Phone ____________________________

Your support will be fully appreciated.
Thank you,

Julie Kambiljambi Kep (Ms)
PhD Candidate
The Chief Executive Officer  
Mendi General Hospital  
Free Mail Bag  
Mendi, Southern Highlands Province

Dear Mr Turian

Subject – Seeking permission for data collection statement at your hospital setting

I Julie Kamblijambi Kep, a PhD student currently studying at RMIT university, Discipline of Nursing and Midwifery; School of health science, Melbourne would like to seek your permission to use the hospital setting for purpose of data collection. The data for the purpose of the study will be collected on the graduates of the Bachelor Clinical Maternal and Child from Goroka University from 2006-2009 employed at your hospital.

The purpose of the study is to evaluate the strength and weakness of the perceived transfer of knowledge and skills to the village birth attendants and onto the postpartum women resulting from the University of Goroka, BCMCH 2005-2009 training. The process of investigation will involve face to face interviews will be conducted with a cohort of selected graduate who have provided informed consent. This will take place in a private room and takes approximately 30 mins.

The aim of the study is to rigorously evaluate the strength and weakness of previous program based on empirical data from the identified stakeholder. This knowledge will inform the potential implementation as new high degree course for PNG University with the Bachelor Maternal and child health as single strand

A secondary aim is to provide empirical data for the PNG Department of Health on a new clinical position for maternal and child health graduate through more sustainable and relevant partnership with community ultimately contributing to addressing maternal and infant morbidity and mortality. A copy of the completed work will be supplied to your organization for your reference upon completion of the thesis.

The RMIT University Ethics Advisory Committee (CHEAN) after reviewing my application asked me to produce an approval letter from the Health setting giving the authority for me to use the setting for the purpose of data collection. Attached please find the Ethical clearance notification letter from the Medical Research Advisory Committee.

Provided are my contact details.
Mailing address:  
Email –  
Phone –

Your support will be fully appreciated.
Thank you.

Julie Kamblijambi Kep (Ms)  
PhD Candidate
The Chief Executive Officer - Mr Ben Hailie  
Eastern Highlands Health Services  
P.O.Box 392  
Goroka, 441, Eastern Highlands Province

Dear Mr Hailie

Subject – Seeking permission for data collection statement at the health setting

I Julie Kamblijambi Kep, a PhD student currently studying at RMIT university, Discipline of Nursing and Midwifery; School of Health Science, Melbourne would like to seek your permission to use the clinic setting for purpose of data collection. The data for the purpose of the study will be collected on the graduates of the Bachelor Clinical Maternal and Child Care from Goroka University from 2006-2009 employed at the clinics and health setting within Eastern Highlands.

The purpose of the study is to evaluate the strength and weakness of the perceived transfer of knowledge and skills to the village birth attendants and postpartum women resulting from the University of Goroka, BCMCH 2005-2009 training. The process of investigation will involve face to face interviews will be conducted with a cohort of selected graduate who have provided informed consent. This will take place in a private room and takes approximately 30 mins.

The aim of the study is to rigorously evaluate the strength and weakness of previous program based on empirical data from the identified stakeholder. This knowledge will inform the potential implementation as new high degree course for PNG University with the Bachelor Maternal and Child Health as single strand

A secondary aim is to provide empirical data for the PNG Department of Health on a new clinical position for maternal and child health graduate through more sustainable and relevant partnership with community ultimately contributing to addressing maternal and infant morbidity and mortality. A copy of the completed work will be supplied to your organization for your reference upon completion of the thesis.

The RMIT University Ethics Advisory Committee (CHEAN) after reviewing my application asked me to produce an approval letter from the Health setting for the purpose of data collection.

Provided are my contact details.
Mailing address:
Email - Phone -

Your support will be fully appreciated.
Thank you,

Julie Kamblijambi Kep (Ms)  
PhD Candidate
Ms Julie Kumblijambi Kep

Australia

Dear Ms Kep

SUBJECT: YOUR REQUEST TO COLLECT BASELINE DATA ON MATERNAL HEALTH IN EASTERN HIGHLANDS

Thank you for your interest in Eastern Highlands to collect Data as part of your study.

We urge you to follow the country’s protocol as Health Research and that is to get ethical clearance from the PNG Research Council for their approval, before we can accept you to Eastern Highlands.

Contact address is:

The Chairman
Research Council
National Department of Health
P O Box 807
WAIGANI. NCD

Yours sincerely

[Signature]

Chief Executive Officer - PHA
Appendix 3a: Stakeholder A—BCMCH Graduates’ Explanatory Statement

Thesis Title: A Maternal and Child Health Program Outcome Evaluation Study: Examining the Effect of a Targeted Village Birth Attendant Program in Papua New Guinea

Dear Colleague,

My name is Julie Kamblijambi Kep, and I am a PhD candidate, conducting research as part of my PhD thesis in nursing studies, conducted at RMIT University, Victoria, Australia.

The research is titled ‘A Maternal and Child Health Program Outcome Evaluation Study: Examining the Effect of a Targeted Village Birth Attendant Program in Papua New Guinea’.

The participants will be graduates from the Bachelor of Maternal and Child Health, including village birth attendants and communities involved in village birth attendant training and community practice. The benefits will be to better inform long-term maternal and child health outcomes through improved educational knowledge transfer in PNG.

Please be reminded that you have the choice to decline to participate in this research and/or not answer any questions in the semi-structured interview. You will not be penalised for not participating in this research. For privacy purposes, no names will be used that will identify the participants. For those willing to participate, I very much appreciate your participation. Any information obtained will be confidential. Your participation will be beneficial to the country as we collaborate to seek solutions to providing safe maternal and child healthcare, and reducing infant and maternal and infant mortality.

For any enquiries and information concerning this research, please contact the student researcher’s supervisors on the following address.

Professor Eleanor Holroyd
Discipline of Nursing and Health Science
RMIT University—Bundoora West Campus
Building 202.06.11, Bundoora, 3080
Victoria, Australia
Phone: +61399257179

Dr Linda Jones
Discipline of Nursing and Health Science
RMIT University—Bundoora West Campus
Building 202.06.09, Bundoora, 3080
Victoria, Australia
Phone: +61399257417

Thank you,

Julie Kamblijambi Kep (Ms)
PhD Candidate—RMIT University
Appendix 3b: Stakeholder A—Consent Forms for BCMCH Graduates

Thesis Title: A Maternal and Child Health Program Outcome Evaluation Study: Examining the Effect of a Targeted Village Birth Attendant Program in Papua New Guinea

1. I have had the project explained to me, and I have read the information sheet.

2. I agree to participate in the research as described.

3. I agree to participate in the interview as explained to me, and that my voice will be audio recorded.

4. I acknowledge that:

   (a) My participation is voluntary and I am free to withdraw from the project at any time, and to withdraw any unprocessed data previously supplied (unless follow-up is needed for safety).

   (b) The project is for the purpose of research. It may not be of direct benefit to me.

   (c) The privacy of the personal information I provide will be safeguarded and only disclosed when I have consented to the disclosure, or as required by law.

   (d) The security of the research data will be protected during and after completion of the study. The data collected during the study may be published, and a report of the project outcomes will be published and given to AusAID and the National Department of Health in PNG, as the sponsors of the study. Any information that will identify me will not be used.

Participants’ Consent

Signature ____________________________ Date ____________________________
Appendix 3c: Demographic Data for Stakeholder A—BCMCH Graduates

Dear Participant,

Please read and fill in or circle the demographic information as requested.

Code No________________ Date __________________ Province of origin ____________

Age ______________ Gender: male/female (circle one)

Marital status: single, married, widow/separated/divorced (circle one)

Highest educational level: below Grade 10, Grade 10, Grade 11, Grade 12, matriculations studies, other (circle one)

Year completed general nursing ___________ Years of nursing service________

Year completed BCMCH degree _________________________________

Number of years working as BCMCH graduate ______________________________

Current designation _________________________________

Field of employment (hospital, health centre, NGO, etc.) _______________________

Name of village/province for community training _____________________________

Number of VBAs trained___________ Number of weeks for community training __________
Appendix 3d: Semi-structured Interview Guide for Stakeholder A—

BCMCH Graduates

Brief Information

This research is a four-phase study on the transfer of knowledge and skills by graduates from the Bachelor of Clinical Maternal and Child Health to village birth attendants and village child health volunteers in a program conducted at University A. A total of 17 questions were developed through review of the curriculum during Phase 1. The instrument was tested for validity and through pilots and independent member checking prior to the interviews. Each interview will take approximately 30 to 35 minutes.

<table>
<thead>
<tr>
<th>Question no</th>
<th>Question</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Part A: Training module (level of learning for appropriateness and relevance)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>What were the strengths of the BCMCH modules that prepared you for your role as a BCMCH nurse in relation to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Knowledge?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Skills?</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>What were the weaknesses of the BCMCH modules that you would like to see improved or changed in relation to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Content?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Skills?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>What is your perspective on the value of VBA/VCHW training included in the BCMCH curriculum in PNG?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part B: Professional experience placement (PEP) in hospitals (competencies)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>What were the strengths (things that you were able to do) of the previous clinical nursing practice (PEP) when compared with your current practice?</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>What were the weaknesses (things that you were not able to do) in your previous clinical nursing practice (PEP) when compared to your current practice?</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>What new skills did you learn during the PEP in the course you undertook that changed your current practice?</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Now that you are practising, Is there anything that you think could have been included for improved practice?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part C: PEP in the community (competencies)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>What information did you pass onto the village birth attendants and village child health volunteers that you were involved in training in relation to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Knowledge?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Skills?</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>What were the strengths/weakness of your rural community practice when compared to your previous health centre practice that changed</td>
<td></td>
</tr>
</tbody>
</table>
your current practice?

10 Maternal and infant mortality is high in our country, as you are aware. What were you anticipating while you were training the VBA/VCHW in the community?

11 Was there any other information that you feel you could have passed onto your village birth attendants and village child health volunteers that you did not?

Part D: Assessment

12 What methods of assessment helped you to learn better during your training in:
   (a) Classroom settings?
   (b) Clinical settings?

13 How were you assessed on the transfer of knowledge and skills to VBAs and VCHWs in the community?

14 What other ways of assessment would you have liked to see included in your assessment task?

Part E: Learning experience

15 What methods of learning helped you identify your strengths and weaknesses, and enhanced your learning?

Part F: Resources

16 What resources did you want to see included in your learning that were not provided in the:
   (a) Classroom setting?
   (b) Clinical setting?

Part G: Recommendations

17 What would you suggest for future similar training if it is offered in PNG?

Thank you very much for your time in participating in this research,

Julie KambiljambiKep (Ms) (PhD Candidate)
Appendix 4: Stakeholder B—VBAs and VCHWs Explanatory Statement

Thesis Title: A Maternal and Child Health Program Outcome Evaluation Study: Examining the Effect of a Targeted Village Birth Attendant Program in Papua New Guinea

My name is Julie Kamblijambi Kep, and I am a PhD candidate conducting research as part of my PhD thesis in nursing studies, conducted at RMIT University, Victoria, Australia.

The research is titled 'A Maternal and Child Health Program Outcome Evaluation Study: Examining the Effect of a Targeted Village Birth Attendant Program in Papua New Guinea'.

The participants will be graduates from the Bachelor of Maternal and Child Health, including village birth attendants and communities involved in village birth attendant training and community practice. The benefits will be to better inform long-term maternal and child health outcomes through improved educational knowledge transfer in PNG.

Please be reminded that you have the choice to decline to participate in this research and/or not answer any questions in the semi-structured interview. You will not be penalised for not participating in this research. For privacy purposes, no names will be used that will identify the participants. For those willing to participate, I very much appreciate your participation. Any information obtained will be confidential. Your participation will be beneficial to the country as we collaborate to seek solutions to providing safe maternal and child healthcare, and reducing infant and maternal and infant mortality.

For any enquiries and information concerning this research, please contact the student researcher’s supervisors on the following address.

Professor Eleanor Holroyd
Discipline of Nursing and Health Science
RMIT University—Bundoora West Campus
Building 202.06.11, Bundoora, 3080
Victoria, Australia
Phone: +61399257179

Dr Healther Pisani
Program and Course Development Coordinator
Lecturer in Nursing
RMIT University, Building 201.2.8

Thank you,

Julie Kamblijambi Kep (Ms)
PhD Candidate—RMIT University
Appendix 4a: Stakeholder B—VBAs and VCHWs Consent Form

CONSENT FORM FOR VBA/VCHW

Thesis Title: A Maternal and Child Health Program Outcome Evaluation Study: Examining the Effect of a Targeted Village Birth Attendant Program in Papua New Guinea

I ___________________________________________ of _________________________ in PNG

(participant) (setting)

agree to take part in the RMIT University research. I have had the purpose of the research explained to me and have read the explanation statement. I understand that agreeing to take part means that I am willing to:

1. be interviewed by the researcher
2. allow the interview to be tape recorded
3. provide relevant information to the student researcher.

I understand that any information I provide will not involve discussion of any individual graduate’s personal information.

Signature __________________________________________

Date ________________________________________________
Appendix 4b: Stakeholder B—VBA and VCHWs (Back-translation of the Information Sheet and Consent Forms)

**TOK SAVE BILONG OL VBA NA VCHW**

**HET TOK: WOK PAINIM AUT LONG AUSIT OL NES MERI NA MAN LAINIM OL VBA NA VCHW INSAIT LONG KOMUNITI LONG PAPUA NUIGINI**

Dia VBA/VCHW

Nem bilong mi, Julie Kamblijambi Kep, Mi wapela sumatin long RMIT Univesiti long Australia. Mi wokim wok painim aut long hausit ol nes sumatin long Goroka Univesiti i bin lainim ol VBA na VCHW insait long komuniti bilong yupela.

Dispela wok painim aut bai kamap namel long yupela ol VBA, VCHW na mi. Dispela wok painim aut em bilong helpim mipela ol tisa and wokman bilong hausik long painim sampela gutpela rot bilong giving gupela skul long ol wok man meri bilong hausik na tu ol lain long komuniti.

Mi laik toksave olsem, sapos yu no laik stap insait long dispel wok painim aut em i orait yu ken lusim and no nogat man bai koros long yu. Mi amamas long yu bai stap insait long dispel wok painim aut na tu toksave olsem olgeta toktok you mekim bai mi tasol bai save na holim. Helpim bilong yu long dispel wok painim aut bai helpim yumi long painim rot bilong stopim ol mama bai ol i no ken dai long taim ol i gat bel na karim na tu ol bebi ol i karim mas noken dai.

Sapos yu gat sampela askim or laik save moa long dispel wok painim aut plis you can rin or rait long ol tisa meri i go pas na wok wantaim me long adres i stap ananit.

**Professor Eleanor Holroyd**  
Discipline of Nursing and Health Science  
RMIT University—Bundoora West Campus  
Building 202.06.11, Bundoora, 3080  
Victoria, Australia  
Phone: +61399257179

**Dr Heather Pisani**  
Program and Course Development Coordinator  
Lecturer in Nursing  
RMIT University, Building 201.2.8  
Ph +61399257448

Tenkiu,

Julie Kamblijambi Kep (Ms)  
PhD Candidate—RMIT University
Tok orait Pepa bilong ol VBA na VCHW

Het Tok: Wok painim aut long ausit ol Nes meri na man long Goroka univesiti lainim VBA na VCHW

Mi ____________________________ bilong ____________________________ long PNG

Nem bilong yu Ples

Tok orait bilong mi long hia i min olsem, mi harim pinis long as tingting long wok painim out. Mi yet mi ridim tu dispel tok save long wok painim out wantain dispela sumatin bilong RMIT univesti. Tok orait bilong mi long hia i min olsem mi tok orait long:

1. Stap insait long dispel wok painim aut
2. Mi tok orait long sumatin bai usim tape rekoder long kisim toktok bilong me
3. Mi bai givim wanem kain toktok em i askim mi long mekim.

Mi luk save tu olsem wanem kain toktok mi mekim mi bai toktok long samting em i kamap long me tasol.

Mak bilong mi ____________________________

Date ____________________________
Appendix 4c: Demographic Data for Stakeholder B—VBAs and VCHWs (Interviewer Filled Prior to Focus Group Interview)

Code No_________________________ Date ______________________

Age __________________ Gender: male/female (circle one)

Marital status: single, married, widow/separated/divorced (circle one)

No of your own children ___________________________

Highest educational level: did not go to school, Grade 1–6, Grade 7–10, above Grade 10 (circle one)

Village _____________________________ Year of VBA training __________

Number of years you have worked as VBA __________________________

Number of women referred or escorted to hospital __________________

Number of children referred or escorted to hospital __________________

Number of women you delivered in the village ____________________________

Number of women who died in the village from childbirth after your training as VBA __________

Number of babies who died after your training as VCHW ______________

Number of sick people from your community you referred or escorted to the hospital_____  

Number of adults you escorted to hospital __________________________

Previous work experience in pregnancy, childbirth or care of newborn prior to VBA or VCHW training ___________
Appendix 4d: Semi-structured Interview Guide for Stakeholder B—VBAs and VCHWs

**Brief Information**

This research is a four-phase study on the transfer of knowledge and skills by graduates from the Bachelor of Clinical Maternal and Child Health to village birth attendants and village child health volunteers in a program conducted at University A. A total of 11 questions were developed through thematic analysis of face-to-face interviews with Stakeholder A—graduates of the Bachelor of Maternal and Child Health. The instrument was tested for validity and through pilots and independent member checking prior to the interviews. The focus group interview will take approximately 1.5 hours and will be translated to PNG’s national language (Pidgin).

<table>
<thead>
<tr>
<th>Question no.</th>
<th>Question</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A: Knowledge and skills impartation (VBA and VCHW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>What knowledge did you learn that was relevant to your practice as a VBA? And why?</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>What knowledge did you learn that was relevant to your practice as a VCHW? And why?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>What skills were relevant to your practice as a VBA? And why?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>What skills were relevant to your practice as a VCHW? And why?</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>What were you not taught that should have been included in this training?</td>
<td></td>
</tr>
<tr>
<td>Part B: Knowledge transfer for positive community health outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>How did you use the knowledge and skills you were given as a VBA in the community?</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>How did you use the knowledge and skills you were given as a VCHW in the community?</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>What effect did your training as a VBA and VCHW have in your community?</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>How did health students living in the community, and training you as a VBA and VCHW, help you in your learning?</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>What support would you require for your work to continue as a VBA and VCHW?</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>What do you think could be improved or applied further regarding this type of training in your community in the future?</td>
<td></td>
</tr>
</tbody>
</table>

Thank you,

Jkamblijambi Kep (PhD Candidate/ Researcher)
### Appendix 4e: Emerging Themes for Focus Group Discussion with Stakeholder B—VBAs and VCHWs

#### Emerging Themes

Nine main themes emerged from the data, which had multiple subthemes, as presented in the table below.

Table A.1

<table>
<thead>
<tr>
<th>Study Themes and Subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Themes</strong></td>
</tr>
<tr>
<td>-----------------</td>
</tr>
</tbody>
</table>
| Comparing past to present in ‘village mama and papa’s’ perspectives | • New knowledge for better practice  
• Clean living, not witchcraft and sorcery  
• From ‘not have to have’ and from ‘not doing to doing’  
• Sharing paid knowledge  
• We could live like they did |
| Losing blood and saving lives: recognising the problems and their effect on women | • Fare distance, no transport  
• Understanding and knowing the reason for referrals |
| Banana/palm leaves and birth | • Learning how to check pregnant women  
• Using ‘CLEANS’ when preparing and caring  
• No pain, don’t push |
| Saving babies’ lives by looking for ‘too sick’ signs | • Having doctor’s eyes to recognise ‘too sick’ and ‘not too sick’  
• ‘Telling the difference’—what sick signs to find in different age groups |
| Trust and recognition for better birth outcomes | • Community trust and hospital recognition |
| Going the extra mile to reach the unreached | • Needing the ‘paddle’ to reach inland community  
• Bring it back and let it bear fruit of success |
| Unplanned pregnancies and family planning | • Teenage pregnancy; trust and home birth  
• Family planning—‘new change’ |
| Limited knowledge and new encounters | • New knowledge brings new problems  
• Learning through self-checking and self delivery |
| Promoting growth and protection for health outcomes | • Grow well and be educated  
• Immunisation as a ‘fence or banis’ for disease |
Appendix 5: Explanatory Statement for Stakeholder C—Postnatal Women (Tok save bilong ol Mama Karim Pinis Bebi)

HET TOK: WOK PAINIM AUT LONG AUSIT OL NES MERI NA MAN LAINIM OL VBA NA VCHW INSAIT LONG KOMUNITI LONG PAPUA NUIGINI

Dia sista,

Nem bilong mi, Julie Kamblijambi Kep, Mi wanpela sumatin long RMIT Univesiti long Australia. Mi wokim wok painim aut long hausit ol nus sumatin long Goroka Univesiti i bin lainim ol VBA na VCHW insait long komuniti bilong yupela.

Dispela wok painim aut bai kamap namel long yupela ol mama husait ol VBA I bin helpim you Inog taim bilong you gat bel and karim Pikinini. Dispela wok painim aut em bilong helpim mipela ol tisa and wokman bilong hausik long painim sampela gutpela rot bilong giving gupela skul long ol wok man meri bilong hausik na tu ol lain long komuniti.

Mi laik toksave olsem, sapos yu no laik stap insait long dispel wok painim aut em i orait yu ken lusim and no nogat man bai koros long yu. Mi amamas long yu bai stap insait long dispel wok painim aut na tu toksave olsem olgeta toktok you mekim bai mi tasol bai save na holim. Helpim bilong yu long dispel wok painim aut bai helpim yumi long painim rot bilong stopim ol mama bai ol i no ken dai long taim ol i gat bel na karim na tu ol bebi ol i karim mas noken dai.

Sapos yu gat sampela askim or laik save moa long dispel wok painim aut plis you can rin or rait long ol tisa meri i go pas na wok wantaim me long adres i stap ananit.

Professor Eleanor Holroyd
Discipline of Nursing and Health Science
RMIT University—Bundoora West Campus
Building 202.06.11, Bundoora, 3080
Victoria, Australia
Phone: +61399257179

Dr Healtfer Pisani
Program and Course Development Coordinator
Lecturer in Nursing
RMIT University, Building 201.2.8
Ph +61399257448

Tenkiu,

Julie Kamblijambi Kep (Ms)
PhD Candidate—RMIT University
Appendix 5a: Consent Form for Stakeholder C—Postnatal Women

(Tok orait Pepa bilong ol Mama Karim Pinis Bebi)

Het Tok: Wok painim aut long ausit ol Nes meri na man long Goroka univesiti lainim VBA na VCHW

Mi _____________________________ bilong _____________________________ long PNG

Nem bilong yu Ples

Tok orait bilong mi long hia i min olsem, mi harim pinis long as tingting long wok painim out. Mi yet mi ridim tu dispel tok save long wok painim out wantain dispela sumatin bilong RMIT univesti. Tok orait bilong mi long hia i min olsem mi tok orait long:

1. Stap insait long dispel wok painim aut
2. Mi tok orait long sumatin bai usim tape rekoder long kisim toktok bilong me
3. Mi bai givim wanem kain toktok em i askim mi long mekim.

Mi luk save tu olsem wanem kain toktok mi mekim mi bai toktok long samting em i kamap long me tasol.

Mak bilong mi _____________________________

Date _____________________________
Appendix 5b: Demographic Data for Stakeholder C—Postnatal Women (Interviewer Filled Prior to Focus Group Interview)

Code no ___________________________ Date ______________________

Age ___________________________

Marital status: single, married, widow/separated/divorced (circle one)

Highest educational level: did not go to school, Grade 1–6, Grade 7–10, above Grade 10 (circle one)

Village ___________________________ Date of delivery of child assisted by VBA ________________

Number of your own children alive ___________________________

Number of your own children who died ___________________________

Location that you attended antenatal clinic—village or health facility (hausik) ___________________________

No of children delivered by VBA ___________________________

No of children delivered in the hospital ___________________________

Which part of the baby came first when you delivered? ___________________________

Did you face any problems while you were pregnant? If so, what? ___________________________

Did you have any problems during the time of childbirth? If so, what? ___________________________

Did you have any problems after delivering your baby? If so, what? ___________________________

What steps did the VBA take to help you in these problems? ___________________________

RMIT UNIVERSITY
Appendix 5c: Semi-structured Interview Guide for Stakeholder C—
Postnatal Women

Brief Information

This research is a four-phase study on the transfer of knowledge and skills by graduates from the Bachelor of Clinical Maternal and Child Health to village birth attendants and village child health volunteers in a program conducted at University A. A total of nine questions were developed through thematic analysis of focus group interviews with village birth attendants and village child health workers. The instrument was tested for validity and through pilots and independent member checking prior to the interviews. Individual interviews will take approximately 20 to 30 minutes, and will be translated to PNG’s national language (Pidgin).

<table>
<thead>
<tr>
<th>Question no.</th>
<th>Part A: Before birth of baby</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What advice did the VBA give you on how to care for yourself and your baby when you were pregnant?</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>What help did you receive from the VBA during your pregnancy?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part B: During birth</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Why did you choose to have your baby in the village instead of hospital?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>What preparation was done by the VBA for you to deliver in the village?</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Did the VBA identify any problems in you before, during or after birth? If yes, what help did you get from the VBA?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part C: After birth of baby</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>What other advice were you given by the VBA on how to care for yourself and your baby after the baby was born?</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Did having the VBA take you to a health facility help you? If so, how?</td>
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<td></td>
<td>Part D: Role of VBA in the community</td>
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<tr>
<td>8</td>
<td>How did having the VBA in the community help?</td>
<td></td>
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<tr>
<td>9</td>
<td>What else might you suggest would be helpful support from your community for the VBA?</td>
<td></td>
</tr>
</tbody>
</table>