Factors That Influence Papua New Guinean Young People's Sexual and Reproductive Health, Which May Affect Their Completion of Tertiary Programs: A Mixed Methods Study

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A thesis submitted for the degree of Doctor of Philosophy (Health)

College of Medicine and Dentistry

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Declaration

I declare that:

- This thesis comprises my own original work, which I undertook for the purpose of this PhD study.
- All materials contained herein have not been written or previously published by any other person for the purpose of acquiring another degree or diploma in another educational institution.
- The intellectual contributions of other persons, including the joint contributions of co-authors, are clearly acknowledged in appropriate sections of this thesis.

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Maggie Ikinue Baigry

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Statement of Contribution of Others

Intellectual Support

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Jointly Authored Work Contained in This Thesis

Thesis chapter	Detail of publication	Nature and extension of the intellectual input of each author
2	Baigry, M. I., Ray, R., Lindsay, D., Kelly-Hanku, A., & Redman-MacLaren, M. (2023). Barriers and enablers to young people accessing sexual and reproductive health services in Pacific Island Countries and Territories: A scoping review. *PLOS ONE*, *18*(1), Article e0280667. https://doi.org/10.1371/journal.pone.0280667	MIB and MRM conceptualised the study and study methodology. MIB conducted database searches, literature reviews and data extractions and analyses and wrote the original draft. MIB, MRM, RR and DL performed quality assessments of the publications. All authors were involved in writing and editing, and RR, DL, AKH and MRM had supervisory roles.

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Abstract

Good sexual and reproductive health (SRH) is reflected in physical, mental and social wellbeing. For young adults to maintain good SRH, they require understanding and support for their SRH needs. These include having the opportunity to make informed choices about when to have children and the number of children to have, and their ability to engage in safe, satisfying sexual activities. Globally, it has been shown that young people who access quality SRH services and accurate information are more likely to avoid unplanned pregnancies and sexually transmitted infections (STIs). In Papua New Guinea (PNG), young adults enrolled for tertiary education courses often experience compromised SRH because of the limited use of contraceptives, high STI transmission rates and limited access to quality SRH services, which affects their completion of university programs. This thesis addresses this gap to describe and understand factors that influence young, educated adults' SRH and its relationship to the successful completion of tertiary education at PNG's universities.

Papua New Guinea, a Pacific Island Country, encompasses the eastern half of the island of New Guinea and shares the landlocked border with the Papua Province of Indonesia. It is a hyper-diverse middle-income nation with more than 800 languages, rich cultural traditions and hundreds of Indigenous ethnic groups. However, access to quality primary healthcare services remains a challenge for many, including young adults pursuing tertiary education.

As an Indigenous woman from Yangoru in the East Sepik Province of PNG, I have spent more than a decade working as a university academic. Throughout my early career, I observed with great concern the numerous instances of young women discontinuing their studies because of negative outcomes stemming from sexual relationships. These outcomes ranged from unplanned pregnancies and STIs to sanctions and even dismissal from the university. The stories of these young women have motivated me to undertake this research.

Guided by a pragmatist worldview, I used an explanatory sequential mixed methods study design for this research. The study began with an online survey using convenience sampling to recruit survey respondents. The themes explored during the qualitative data collection were informed by the quantitative results. Qualitative data were collected in a culturally appropriate manner using a storytelling approach. A short story was written based on the survey participants' demographic characteristics and key elements of the quantitative results. This

story was shared with purposively selected participants from among the survey respondents during anonymous one-on-one telephone interviews. Quantitative and qualitative data were analysed independently and then integrated and interpreted through a visual representation of the participants' (students') experience.

In all, 228 undergraduate students from six PNG universities completed the online survey, and 12 among them also participated in the anonymous telephone interviews. Participant age ranged from 19 to 32 years, and the majority lived on university campuses. They reported a general knowledge of STIs, reproduction and contraceptives, including services from which they could obtain modern contraceptives. However, they lacked accurate understanding regarding the correct use of oral and emergency contraceptive pills to avoid unintended pregnancies. Sexually experienced participants had multiple concurrent sexual partners, and most did not use condoms regularly, including during the most recent sexual intercourse. Consequently, unplanned pregnancies were reported frequently, which mostly affected the academic progress of female students.

Less than 20% of the participants reported accessing SRH services. Fear of violating family values and expectations, and exclusionary policies that universities applied if students were found to be having sex, resulted in secretive premarital sexual activities among the participants. In addition, social stigma about sexual activities among unmarried young people was a barrier to accessing SRH services. In contrast, it was reported that a support system providing SRH services on university campuses would delay unplanned pregnancies and STIs.

Overall, the study findings provide a detailed understanding of tertiary students' challenges in utilising SRH services for information, contraceptives and proper STI diagnosis and treatments in PNG. Multi-level barriers limit opportunities for young adults to enjoy good SRH, which affects their successful completion of university programs. The socio-ecological model (SEM) was used for a detailed understanding of this study's results. This theoretical model considers the influence of the physical, social and policy environments on health outcomes.

At the intrapersonal level, young adults' SRH knowledge is shaped by their cultural and church-affiliated beliefs and their individually acquired knowledge through formal or informal education. Their SRH-seeking behaviour is influenced by household beliefs, community norms and expectations and healthcare providers' behaviours. At the interpersonal level, judgemental attitudes, and social stigma expressed through gossip primarily by friends, peers, family and

community members, including healthcare providers, have deterred young adults from seeking and accessing SRH services in PNG, but trusted friends were enablers. This finding of the effects of the collective society on individual SRH-seeking behaviour and knowledge in this study is consistent with that of studies on young people in other Pacific Island Countries and Territories (PICTs).

Institutions' regulations, policies and informal structures were reasons that young adults with SRH needs avoided accessing university campuses' healthcare clinics—that is, they feared they would be reported and face the university's disciplinary actions. Cultural and religious expectations to abstain from premarital sex have created judgemental attitudes and social stigma towards sexually active young adults, thus disempowering young men and women from seeking healthcare services within university clinics and other SRH services. Earlier studies showed that young adults raised in strict cultural and religious practices have some of the worst SRH outcomes.

Young university students need a strong political will, continuous government financing and ongoing monitoring of the health workforce to significantly reduce STI prevalence and unplanned pregnancies if the government is serious about lifting the majority of young adults out of poverty. Strengthening the implementation of youth-friendly SRH services by promoting non-judgemental care may increase young people's utilisation of SRH services. The implementation of PNG's SRH policy is stagnant because of weaknesses in the government's current structures and systems.

In conclusion, this study aimed to explore and understand factors that influenced the SRH of young people in PNG and its relationship to their successful completion of tertiary (university) education. Young university students in PNG need government action to address the primary barriers they face in maintaining their SRH. Revising student pregnancy policies and establishing user-friendly SRH clinics on university campuses could reduce students' stress associated with unintended pregnancies and STIs and improve their academic performance. This study recommends that user-friendly SRH clinics be established on university campuses for safe and easy access to contraceptives and STI diagnosis and treatment. Clear guidelines and pregnancy policies must be established to support pregnant students in completing their university education. Research is needed to explore the visibility and acceptability of establishing user-friendly SRH services on university campuses.

COVID-19 Research Impact Statement

The field work for data collection in my home country Papua New Guinea (PNG) was due to start in early 2020, the same time as the coronavirus disease (COVID-19) pandemic started. With the international travel restriction coming into effect in March 2020, I was advised to change my data collection methods from face-to-face to an online survey and telephone interviews. This change enabled the collection of sufficient quantitative and collective data for this thesis.

The major challenge created by the COVID-19 pandemic was the time lost because of the delay in obtaining ethics approval from the PNG Medical Research Advisory Committee (MRAC). Since this study focused on young people in PNG, it was a requirement from the James Cook University (JCU) Human Ethics Committee to seek approval from the country in which the study will be conducted and then secure reciprocal approval from them (i.e. JCU Human Ethics Committee). This requirement was considered necessary because Papua New Guinea MRAC would be more familiar with the ethics requirements for research conducted among young people in PNG. The enforcement of the lockdown in PNG, as in Australia and other countries, disrupted the schedules of the Papua New Guinea MRAC meetings to review study protocols, which delayed my progress with data collection. I overcame this challenge by emailing the Chairman of Papua New Guinea MRAC and requesting executive approval. I argued that the delay in reviewing my study protocol affected my scholarship as a full-time international student.

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List of Abbreviations

COVID-19	Coronavirus disease
DHERST	Department of Higher Education, Research, Science and Technology
DWU	Divine Word University
HIV	Human immunodeficiency virus
JCU	James Cook University
LGBTQIA^{+}	Lesbian, gay, bisexual, transgender, queer, intersex and asexual plus
MDG	Millennium Development Goals
MeSH	Medical subject headings
MRAC	Medical Research Advisory Committee
NDoH	National Department of Health
NEC	National Executive Council
PAU	Pacific Adventist University
PHA	Provincial Health Authority
PhD	Doctor of Philosophy
PICTs	Pacific Island Countries and Territories
PNG	Papua New Guinea
SEM	Socio-ecological model
SPSS	Statistical Package for the Social Sciences
SRH	Sexual and reproductive health
STI	Sexually transmitted infection
UNFPA	United Nations Population Fund
UPNG	University of Papua New Guinea
WHO	World Health Organization

Glossary

Term	Definition
Abortion	The termination of pregnancy by the removal or expulsion from the uterus of a foetus or embryo prior to viability.
Attitude	A person's view (value and belief) about a thing, process or person that often leads to positive or negative behaviours.
Adolescence	The period of physical and emotional change between the beginning of puberty and early adulthood.
Access to health services	The perceptions and experiences of people about their ease of reaching health services or health facilities in terms of location, time and ease of approach.
Beliefs	The acceptance that something exists or is true.
Behaviour	A person way of relating or responding to the action of others or an environmental stimulus.
Condom	A sheath made of latex rubber, plastic or silk that is fitted over the penis during sexual intercourse.
Contraception	The prevention of unintended pregnancy, which can be achieved by various means.
Contraceptive	Any behaviour, device, medication or procedure used to prevent pregnancy; also known as birth control.
Culture	The ideas, customs and social behaviours of a particular people or society.
Family planning	A process that allows people to decide when and whether to have children, using the information, means and methods they need to do so. It is achieved through the use of contraceptive methods and the treatment of infertility.
Gender	The social constructed roles, behaviours, activities and attributes that are considered by a society to be appropriate for people.
Health	A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.
Healthcare provider	A licensed doctor, nurse, nurse practitioner, nurse-midwife or physician assistant.
Healthcare services	Services performed by health professionals or by others under their direction to promote, maintain or restore health protection and promotion and disease prevention.
Intimate partner	A person with whom closeness is felt when sharing intimacy.
Intimacy	The closeness one feels when sharing one's private and personal self with someone else.

Jealousy	Feelings of anxiety about a partner or crush's attention, love or commitment. Fear that a partner has feelings for someone else.
Policy	A written statement used to guide and determine present and future decisions about standards of care.
Pregnancy	The period during which a woman carries a developing foetus normally in the uterus.
Premarital sex	Sex between people who are not married. Many people object to this term, for it implies that all people will eventually get married.
Sexual intercourse	Sexual activity involving penetration, typically by a penis or dildo; most commonly refers to vaginal or anal intercourse.
Sexually transmitted infection	Infections that are passed from one person to another during vaginal, anal or oral sex or sexual skin-to-skin contact, commonly known as sexually transmitted diseases.
Taboo	A behaviour that is outside cultural norms; something society or culture says one should not do or talk about.
Utilisation of health services	Experience of people regarding their receipt of healthcare services of different types.
Unsafe abortion	The termination of an unwanted pregnancy by persons lacking the necessary skills, or in an environment lacking minimal medical standards or both.
Unprotected sex	Having oral, vaginal or anal sex without using protection, such as condoms or birth control, which can increase the chances of STIs or unintended pregnancy.
Women of reproductive age	All women aged 15–49 years.

Prologue

Mary (not her real name) was one of the top students in my human biology class. She scored very high in her assessment tasks. In time, I noticed Mary's ongoing absence. Upon enquiry, I learned from her friends that she had given birth to a baby girl and was instructed to withdraw from her studies. Two years later, I saw Mary again in my human biology class. She had returned to pursue her dream of becoming a Health Extension Officer (Physician Assistant). During the first semester, I noticed she had started missing classes again. This prompted me to ask her why she was not attending tutorial classes. Mary confided in me that she had contracted a sexually transmitted infection. Later, I learned that her ill health had made her withdraw again. Mary has never returned to complete her studies. As a university tutor, I have encountered similar stories of other young women experiencing sexual relationship problems. Many were pregnant and were forced to discontinue their studies. Others terminated their pregnancies, whereas some attended classes with swollen eyes and broken lips. Consequently, I wondered how I could help these young, intelligent women, and the outcome is this thesis.

Standpoint: Positioning Myself in This Study

I am a proud Indigenous woman from Yangoru in the East Sepik Province of PNG, who possesses lands and natural resources. However, this sense of pride is accompanied by significant responsibilities. I am the second child of my parents and their first daughter. My parents had only two biological children (my brother and I). According to my cultural traditions, as the first daughter, I inherited my paternal grandmother's name, Ikinue, which is why it is my middle name (Maggie Ikinue Baigry). Inheriting my grandmother's name brings me a sense of pride and privilege. For instance, although I come from a patrilineal society, I enjoy the same privileges as my elder brother regarding my father's land. This special privilege (birthright) is enjoyed only by first-born daughters whose fathers are also first-born children. As the eldest daughter, I am responsible for leading a responsible life, adhering to the traditional expectations of being a strong woman and upholding my birthright privileges. This means that my actions, behaviours and conduct must reflect the traditional values of my culture.

I was born in the Autonomous Region of Bougainville and grew up living in various provincial towns in PNG. My father's occupation as a senior Magistrate required him to be posted to different provinces. Some of my earliest childhood memories and photographs from my parents' album show that when I was two years old, my father was posted to work in Minj, the provincial town of Jiwaka Province. From Minj, we moved to Mount Hagen in Western Highlands Province, followed by Lae in Morobe Province. After living in Lae for about a year, my father was posted to Port Moresby in the National Capital District. My mother decided not to live in Port Moresby with my father, and thus, my brother and I went to live with her in our traditional hamlet in Kufar, Yangoru, East Sepik Province, for about a year. Later, my father was posted to work in Daru, the provincial town of Western Province, and the three of us joined him there. From Daru, my father was transferred to Maprik, a district town in East Sepik Province. We moved to Maprik and lived there for about two years, and then, we moved to Wewak, the main town of East Sepik Province. We resided in Wewak for the longest period of my upbringing.

I attended four primary schools (Table 1) and two secondary schools. After completing Grade 12, I was fortunate to be awarded the Australian Development Scholarship to study in Australia. In 2001–2004, I studied at the University of Queensland in Brisbane and graduated with a Bachelor of Science in Biomedical Science. In 2011, while working as a tutor at Divine

Word University (DWU), I applied for and was awarded another Australian Awards Scholarship for a Master of Public Health Degree (Communicable Disease Control) at James Cook University, Townville.

Table 1: Names and locations of the primary and secondary schools I attended

Grade	School	Town and Province in PNG
1	Yangoru Admin Community School	Yangoru, East Sepik Province
2–4	Daru Chalmers Community School	Daru, Western Province
4–5	Maprik Admin Community School	Maprik, East Sepik Province
6	Mongniol Primary School	Wewak, East Sepik Province
7–10	Brandi High School	Wewak, East Sepik Province
11–12	Sogeri National High School	Sogeri, Central Province

From childhood until now, I have been a member of the Seventh-day Adventist Church. My family is a close-knit nuclear one, which has constantly moved from one town to another. During my childhood days, my brother and I would pass time playing with toys under the care of our mother, who was never formally employed. When my brother and I were in primary and secondary schools, we competed in reading the few books we came across. I always tried to finish reading a book and enjoying the story before my brother found it and took it away, and I become a fast reader through that experience.

In 2003, during my third year of undergraduate study, my mother died of breast cancer. The grief of losing my mother made me return to be with my father until I was offered a job as tutor in 2009 at DWU.

What Led Me to My PhD Thesis?

I took a keen interest in young people's sexual and reproductive health (SRH) through a personal experience when tutoring first-year undergraduate students at DWU. I observed that a few young women in my tutorial classes became obviously pregnant and, soon after, were no longer present in class. The university policy at the time did not allow pregnant students to continue attending classes. Instead, they were instructed to withdraw from studies, raise the child and return after two years.

I was worried at the time, seeing the helpless situation of these young women as they negotiated their sexual relationships in a context where sex before marriage was taboo. In PNG, for a female student to become pregnant outside of marriage is considered shameful for the individual and her family. A female student's father mostly bears the family shame and, at times, forcefully arranges for a marriage or, in extreme circumstances, disowns his daughter. If the latter happens, the daughter must fend for herself and the unborn child. For these reasons of shame, embarrassment and the possibility of family rejection, many young women have resorted to unsafe induced abortion practices. Safe medical abortion, while technically legal, is highly restricted and not accessible.

From my experience, most pregnancies among young people, including university students, are unintentional. Moreover, the adults in the lives of these young women know that these pregnancies are unintended; yet they do little to prevent or help address the SRH needs of these women. I speculate that most adults, like me, cannot help young people because we lack communication skills and the information they need.

Despite all these taboos regarding talking about sex, my job as a tutor at DWU required me to contribute to and lead research. Hence, I decided I wanted to explore factors that influence young adults' SRH and its relationship to their successful completion of university education. This was in 2010, and since I had very little knowledge about epidemiology or qualitative research, I volunteered in research activities purposely to acquire research skills and knowledge. I nominated myself to be a research assistant on a study designed to understand the acceptability of medical male circumcision (MacLaren et al., 2013). During this study, I acquired research skills in conducting focus group discussions and in-depth interviews and in transcribing and translating qualitative data. I also met my primary advisor (Associate Professor Michelle Redman-MacLaren) and colleagues from James Cook University (JCU) and Pacific Adventist University (PAU; Dr Racheal Tommbe).

Building on the experience of working with the JCU research team, I applied for an Australian Awards Scholarship and was awarded a scholarship for a Master of Public Health Degree at James Cook University. With added research skills and knowledge, I wrote a concept paper about the factors that influence the SRH of tertiary students in PNG and its relationship with their successful completion of university courses—which was the start of this PhD thesis.

Insider–Outsider Research

This study describes and presents factors that affect the SRH of PNG university students and how it relates to their completion of the university courses. I developed the concept and conducted this study as a university lecturer at DWU.

In the context of being a lecturer, I see myself as an outsider, an educated, married adult (mother), and someone in an influential position in comparison to my study participants, undergraduate students. Conversely, in the context of my nationality, I see myself as an insider. My upbringing was heavily guided by the same Christian principles that dominate life in PNG and my longstanding cultural norms.

From the stance of being an outsider, I wanted to understand the SRH challenges that PNG university students experience while being enrolled as full-time undergraduate students residing on university campuses away from their home provinces. From the stance of being an insider, I understood the communication barriers surrounding conversations on sex with someone considered a young person (presumably unmarried) and collected data for the current study in a culturally appropriate manner.

Chapter 1: Introduction

1.1 Chapter Overview

In this chapter, I present this study's research problem, aim and objectives; explain how this study contributes to achieving Papua New Guinea's (PNG's) development vision (Vision 2050); and provide a brief background about the country, including its healthcare services and higher education.

1.2 Problem Statement

In PNG, young adults completing tertiary education are greatly valued as potential leaders. However, tertiary settings in PNG rarely support these young adults to avoid the negative consequences of unplanned pregnancies and untreated sexually transmitted infections (STIs). Tertiary education institutions are where many young adults venture into risky sexual behaviours as they are no longer under the watchful eyes of their parents, guardians and extended families (Mazibuko et al., 2023). Young adulthood is a stage of sexual curiosity and experimentation (World Health Organization [WHO], 2021), which can lead to risky behaviours, such as excessive alcohol consumption, casual sex and inconsistent condom use (Cassidy et al., 2018, 2019). While healthy sexual relationships yield many physical and emotional benefits, many young adults are at risk of acquiring STIs and experiencing other negative sexual health outcomes (Cassidy et al., 2018; Mazibuko et al., 2023). If young adults pursuing tertiary education in PNG are not equipped or empowered to maintain a state of healthy sexual health, many will experience the negative effects of unplanned pregnancies, unsafe induced abortions and STIs.

The literature has shown that multilayered barriers and facilitators influence young adults' use of sexual and reproductive health (SRH) services (Kennedy et al 2013; 2014; Mbengo et al., 2022). The barriers to accessing SRH services are those such as location, travel time and confidentiality. Barriers to entry into SRH services include the type of waiting environment, waiting time and the fear of being seen. Furthermore, human interaction barriers include healthcare providers' characteristics and personal stress associated with seeking SRH services (Bender & Fulbright, 2013; Kelly-Hanku, Redman-MacLaren et al., 2020). In Kenya, major barriers that prevent young people from accessing SRH services include healthcare providers' judgemental attitudes, the lack of adequate physical space and privacy, the negative perceptions

of community members, including low parental support, and young people's fear and lack of SRH information (Godia et al., 2013, 2014; Mutea et al., 2020). Similar findings were reported for Nigeria (Nmadu et al., 2020), Ethiopia (Wakjira & Habedi, 2022), Ghana (Abuosi & Anaba, 2019) and South Africa (Mulaudzi et al., 2018). The findings reported for these African countries are consistent with the findings for Malaysia (Othman et al., 2019) and the Lao People Democratic Republic (Sychareun et al., 2018; Thongmixay et al., 2019; Vongxay et al., 2019).

Significantly, access to accurate SRH information and quality healthcare services is important for preventing, diagnosing and treating STIs. Similarly, access to accurate contraception (family planning) information and contraceptives helps prevent unintended pregnancies, unsafe abortions and pregnancy-related deaths (WHO, 2023b). The lack of access to accurate information and these quality healthcare services severely affects young adults' wellbeing and that of their family and local communities (United Nations Population Fund [UNFPA], 2018). At the individual level, accessing quality SRH services means proper diagnosis and treatment and a further reduction in the spread of curable STIs (WHO, 2021). Likewise, adequate understanding of contraceptive methods enables their correct use and possible reduction in unplanned pregnancies (WHO, 2023b). Unplanned pregnancies and child rearing among unmarried young adults (especially young women, in the context of PNG), can significantly reduce their prospects of completing formal education and participating in paid employment. This factor has a negative impact not only on the individual but also on their immediate and extended families (Hukula, 2017; UNFPA, 2020).

Worldwide, STIs are among the most common curable infectious diseases reported (Fu et al., 2022). Before the coronavirus disease (COVID-19) pandemic, an estimated 375 million new curable STIs were reported annually, with a million cases acquired daily, most of which were asymptomatic (WHO, 2023c). During the COVID-19 pandemic, the coverage of STI prevention, testing and treatment services reduced, leading to a global resurgence of STIs (WHO, 2023d). Even countries with effective STI surveillance, such as the United States and Canada, have since reported the increased occurrence of syphilis and gonorrhoea (WHO, 2023d). Thus, there is a global urgency to strengthen diagnostic programs and services for addressing human immunodeficiency virus (HIV) transmission and other STIs, along with surveillance, as the COVID-19 pandemic may have obscured the true magnitude of STIs in various countries, including PNG.

Data from earlier studies and the PNG Demographic and Health Survey 2016-18 have shown that PNG had the highest prevalence of HIV and other curable STIs, such as syphilis, gonorrhoea, chlamydia, genital herpes, warts and trichomoniasis, in the Pacific region before the COVID-19 pandemic (National Statistical Office, 2019; A. Vallely et al., 2010, 2014). Given the rapid increase in the number of new HIV cases from 5,000 in 2019 to 6,500 at the end of 2022 (HIV/AIDS Data Hub for the Asia-Pacific Region, 2023; Vallely et al., 2010), the number of new cases of curable STIs post COVID-19 is expected to have been higher as of March 2024. A possible reason for this rapid incidence of HIV cases is that during the COVID-19 lockdowns, people living with HIV were sexually in contact with more people in their communities or people with curable STIs may have easily become infected with HIV because of the disruption to healthcare services (WHO, 2023c). Moreover, a study similar to the last systemic review in 2010 that established the prevalence of STIs in PNG (A. Vallely et al., 2010), is yet to be conducted in PNG.

Notably, the SRH status of young adults in PNG is somewhat poor. Although the median age for first sexual intercourse is 19 years, and women have their first intercourse much earlier than men (National Statistical Office, 2019), the support to maintain a state of high sexual health is inadequate. Empirical evidence justifying this argument is lacking because not much has been documented about young adults' SRH status in PNG. However, from anecdotal data and from studies on key populations and on women who visit antenatal clinics for routine checks in PNG, it is evident that young adults' sexual health is affected by the HIV epidemic in PNG and by curable STIs and that they have high unmet contraceptive needs (Kelly-Hanku, Weikum et al., 2020; National Statistical Office, 2019; L. M. Vallely et al., 2016, 2017; Weikum et al., 2022). For instance, observations have revealed that among all the women who visited antenatal clinics for routine healthcare checks, women aged less than 25 years who were pregnant for the first time had a higher incidence of more than one curable STI (chlamydia, gonorrhoea and trichomoniasis) than did older women with more than one pregnancy (L. M. Vallely et al., 2016, 2017; Wangnapi et al., 2015). These infections have been linked to adverse pregnancy outcomes and have contributed to poor maternal and neonatal health in PNG (L. M. Vallely et al., 2016, 2017; Wangnapi et al., 2015).

In addition, specialised healthcare services, including SRH services, are limited in PNG (Saweri et al., 2022). The two prominent specialised SRH services operating under government jurisdiction are the antenatal and postnatal healthcare services, following the need to reduce

PNG's high maternal and neonatal morbidity and mortality rates (Dennis, 2018; Saweri et al., 2022; Tynan et al., 2014). Despite the higher rates of unplanned pregnancies and STIs among young adults in PNG, the government is yet to establish youth-friendly sexual and reproductive healthcare clinics, let alone specialised services targeting men's health. For example, a study conducted among university students about the acceptability of male circumcision found that many young adult male students desiring this operation did not have it performed in a healthcare clinic (MacLaren et al., 2013).

Moreover, young tertiary students in PNG have unmet contraceptive needs because of their inability to access contraceptive services and commodities. Access to contraceptives is particularly challenging among young unmarried women because their access and use would be regarded as their intention to engage in seemingly 'promiscuous' relationships, that is, sex outside of marriage (Hemer, 2019; Keck, 2007). Only 18% of sexually active unmarried women, including educated young adults, used some form of contraceptives in 2016-18 (National Statistical Office, 2019). In comparison, married couples have easier access to contraceptive services because of social norms (Keck, 2007). Furthermore, the lack of friendly SRH services for young people in PNG places them at higher risk of adverse health consequences. Therefore, this thesis addresses this knowledge gap to understand factors that influence young, educated adults' SRH and its relationship to their successful completion of tertiary education at PNG's universities.

1.3 Research Question

What factors influence Papua New Guinean tertiary students' sexual and reproductive health and its relationship to their successful completion of university education?

1.4 Study Aim and Objectives

1.4.1 Aim

The aim of this study is to describe and understand factors that influence the SRH of young people in PNG and its relationship to their successful completion of tertiary (university) education. This aim was achieved through the objectives presented in the next section.

1.4.2 Objectives

1. Describe the SRH knowledge and practices of university students.

2. Explore and explain the individual, social and cultural factors that influence the SRH of university students.
3. Analyse barriers to, and enablers of, university students' willingness to access SRH services, including the influence this may have on program (course) completion.
4. Apply the socio-ecological model to identify and map key recommendations that will inform and improve the SRH of university students.

Note: The data and interpretation of the findings in this thesis predominantly relate to heterosexual gender relationships. I acknowledge the lesbian, gay, bisexual, transgender, queer, intersex and asexual (LGBTQIA+) population in PNG and that the LGBTQIA+ population have specific sexual and reproductive health needs that may not be represented in the findings reported in this study.

Next, Section 1.5 describes how the information generated from this thesis contributes to PNG development priorities in SRH areas.

1.5 How Does This Study Contribute to Achieving Papua New Guinea's 'Vision 2050'?

For PNG to achieve its Vision 2050 of being a healthy, wealthy and wise nation (National Government of Papua New Guinea, 2011), all its citizens must play a role in its development strategies. Thus, this thesis contributes to an informed improvement in the PNG population's health and wellbeing.

First, the findings of this study contribute to the existing knowledge required to improve SRH and higher education policies in PNG. Data from the 2016-18 National Demography Health Survey indicated that almost half of PNG's population were young people aged less than 25 years (World Bank, 2022; National Statistical Office, 2019). While the current health system provides specific health services for pregnant women and infants, such as antenatal and postnatal clinics (National Department of Health [NDoH], 2021), specialised healthcare services that cater to the SRH needs of young people are still unavailable. This study evidence context-specific barriers to and enablers of university students' willingness to access existing SRH services in PNG.

Further, the findings of this study would contribute to achieving Key Strategic Area 6.2 in the PNG Development Strategic Plan 2010-2030, Part 6 of the Cross-Cutting Policy, which aims to reduce the number of teenage (young adult) pregnancies and childbearing from the baseline

of 13% to less than 5% by 2030 (Unintended pregnancies are also linked to unsafe induced abortion, which results in maternal death among adolescent girls and female youth (Government of Papua New Guinea, 2010). Family planning (contraceptive) services must be easily accessible and effectively used to avert unintended pregnancies.

Last, the goal of Key Strategic Area 6.4 in the PNG Development Strategic Plan 2010-2030 Part A: Cross-Cutting Policy is to have a healthy population free from the threat of STIs and HIV/AIDS (i.e. acquired immunodeficiency syndrome). Most PNG citizens are aware of the consequences of STIs, including HIV infection (NDoH, 2021). However, PNG's STI and HIV infection rates are still high compared with the rates in neighbouring Pacific Island Countries and Territories (PICTs). Thus, the findings of this study add to the existing knowledge on STIs and inform policymakers on the types of specific barriers and possible enablers that can help reduce and prevent STIs.

In the following subsections of this chapter, I present a brief background about PNG, the setting of this study, in terms of its geography, people and culture, religion, politics and additional characteristics, which would help in the interpretation of the findings.

1.6 Papua New Guinea: A Brief Background

PNG is an independent nation situated in the Southern Pacific Ocean (island of New Guinea) and shares a landlocked border with Indonesia (Standish & Jackson, 2023). The National Statistical Office and the UNFPA estimated its population to be approximately 12 million using the Population Modelled Estimate for 2021(National Statistical Office, 2023). Because of the absence of written records, such as hospital records, the numbers of births and deaths that occur in isolated rural communities are not documented. Therefore, population estimates are used. Furthermore, the last general census was conducted in 2011, and the next one is scheduled for 2024 because of the COVID-related and other delays in 2021. Out of this population, 50% consists of young people who are less than 24 years old (World Bank, 2022). In addition, 85% of the total population resides in rural communities.

1.6.1 Geography

PNG is located a few degrees south of the equator in the Southwestern Pacific. Its shares its western land border with the Papua Province of Indonesia. To the south lies Australia, along with the Coral Sea, while to the east, across the Solomon Sea, is the sovereign state of the

Solomon Islands. Surrounding mainland PNG are several large islands, including New Britain, New Ireland, Bougainville to the east, and Manus to the north (Standish & Jackson, 2023).

PNG has a land area of 462,860 square kilometres and boasts rugged mountains predominantly known as the Central Cordillera, located within the interior of the mainland (Klootwijk et al., 2003). These mountains give rise to numerous streams that converge to form mighty rivers, which nourish vast swamplands as they wind their way through wide valleys and plains and eventually reach the sea. Notable rivers in the country include the Sepik River in the north and the Fly River in the south. Much of the country, excluding the cold, mountainous areas of the Highlands, is covered by dense tropical rainforests (Standish & Jackson, 2023).

Figure 1.1: Map of Papua New Guinea

1.6.2 People, Culture and Population

Archaeological evidence suggests that humans arrived in New Guinea, including the West Papua Province of Indonesia, more than 70,000 years ago (Bulmer, 1975). Some of these individuals migrated inland and settled in the fertile valleys of the mountainous interior, such as the Waghi Valley in the Western Highlands Province of PNG (Bourke & Harwood, 2009; Golson et al., 2017). Some of the earliest agricultural practices in the world originated in this region (Golson et al., 2017). These inland communities remained largely isolated from external

contact until the early 1900s when Christian missionaries from the northern coast embarked on journeys on foot into the mainland's interior (Turner & Moore, 2003).

Portuguese and Spanish explorers Jorge de Menezes and Yñigo Ortiz embarked on the first recorded visit to the island of New Guinea (the eastern half of PNG's mainland) in the 16th Century (Papua New Guinea Tourism Promotion Authority, n.d.). These early European explorers named the island New Guinea owing to the physical resemblance of the native population to the dark-skinned, frizzy-haired people of Guinea in Africa (Florek, 2015). However, it was not until approximately three centuries later that Christian missionaries and traders began to take a greater interest in New Guinea and its inhabitants (Gibbs, 2006).

The arrival of Catholic missionaries can be traced back to 1847, when they first landed at Woodlark Island off the coast of Milne Bay in eastern New Guinea (Gibbs, 2006). However, the prevalence of malaria and other insect-borne tropical diseases that affected their mission work resulted in the closure of the Mission Station at Woodlark Island after a few years. Nearly 50 years later, in 1896, the Society of Divine Word, a Catholic missionary group, established a new mission station at Alexishafen in Madang Province. From this base, the missionaries, with the help of local guides, ventured into the mountainous interior and went on foot patrols, making contact for the first time with the local tribes of the PNG Highlands (Gibbs, 2006).

Europeans established a lasting presence on the island of New Guinea towards the end of the 19th century. The Portuguese occupied the western half of New Guinea, known as Dutch New Guinea at the time. Meanwhile, the eastern half of the island was divided among different powers. The German New Guinea Company, operating under the authority of the German Government, occupied the northern part, while the southern part was under the control of England and its former colony, Australia (Hempenstall, 2016). Historically, the northern half of PNG was referred to as German New Guinea or Kaiser William's Land, named after the German ruling leader (Sack, 1985). Similarly, the southern half was known as British New Guinea, later renamed the Territory of Papua when the British Government granted Australia full authority over that part of the island and its inhabitants (Thomson, 1892). Following the Portuguese occupation, the western half of New Guinea became part of Indonesia.

The Indigenous people of PNG are part of the larger Melanesian Islander group, including the Solomon Islands, Vanuatu, Fiji and the Papua Province of Indonesia. Melanesians typically have dark skin and black frizzy hair. However, apart from the majority who are Melanesian,

some Indigenous people have Polynesian ancestry, characterised by fair skin tones and wavy hair. This diversity in complexion helped inform understanding about the early migrations of people across the Pacific (Standish & Jackson, 2023).

In PNG, people in rural areas typically reside in villages or hamlets and rely on subsistence farming. Kin groups usually own most of the land and allocate it based on the family's necessities. This model of customary land ownership accounts for 97% of PNG landmass (Wangi & Ezebilo, 2017). The right to the custody and use of the land is usually passed down from the mother or father, and the intended heirs must provide substantial support and gifts to become the next custodian of the land. Children born outside of a recognised marriage (customary or religious) do not have the same land privileges as those born within it (Matane, 2018).

In most cultural groups or clans, households consist of a husband, wife, unmarried children, young people and, sometimes, the husband's parents. Extended families reside in houses nearby and frequently gather for meals, work parties, ceremonies and companionship within the clan. Typically, young men live in the same house as their unmarried male family members, such as cousins and nephews, while their mothers, fathers, unmarried sisters and younger siblings live in a separate house. Respect for elders is preserved in extended families, and they provide the framework within which kin obligations are met and resources are shared. Families are the primary source of emotional and spiritual support (Hukula, 2017; Matane, 2018). Heterosexual relationships are the norm, with sexual relations between consenting adult men still illegal under section 210 of the *Criminal Code Act 1974* (Human Dignity Trust, 2024).

PNG is renowned for its rich diversity of Indigenous cultures and languages (Standish & Jackson, 2023; World Bank, 2022). Because of its diversity, many different types of cultural expression have emerged. For instance, each cultural group has developed unique forms of art, weaponry, architecture, costume, music, dance and much more. More than 800 *tok ples* (literally, a language of the place—*ples*—of origin) are spoken in PNG, and it has three national lingua franca: Tok Pisin (Pidgin English), Motu and English (Matane, 2018; Mühlhäusler et al., 2003; Volker et al., 2008).

The cultural significance of seashells as currency remains evident in local traditions, despite these rarely being used as currency in PNG at present. Colonisers from Germany, England and Australia introduced cash into the PNG economy, and PNG adopted its own currency on Kina

Day, 19 April 1975, the year the country celebrated its independence from Australia (Matane, 2018; Yakham, 2018). In some parts of the country, a groom is still required to pay a bride price for the wedding ceremony, which may include items such as gold-edged clam shells or tabu shells (found in the East New Britain Province), food, pigs, cassowaries, cash and other goods (Matane, 2018).

In the 2011 census, it was reported that there were 108 males for every 100 females. The population's median age was 21.8 years, and the number of children aged less than 15 years was just under 3 million. On average, a household in PNG consisted of five people, and less than 15% of the population lived in urban centres. There has been a notable annual increase in migration from rural to urban areas, which has resulted in the expansion of settlements around towns and cities. People migrating into urban areas struggle to find employment, thus contributing to the country's high unemployment rates. People in rural areas predominantly engage in subsistence lifestyles, supplemented by the sale of garden produce or cash crops to agricultural exporters (National Statistical Office, 2011).

1.6.3 Religion and Society

Christianity, which was introduced by the colonisers and was enshrined in the Constitution at independence in 1975, is the dominant religion in PNG (Turner, 2001). However, traditional rituals of animism and ancestor worship are still prevalent in the country. According to the 2011 census, 96% of citizens identified themselves as members of a variation of the Christian faith (National Statistical Office, 2011). Roman Catholicism remains the major Christian denomination in PNG, accounting for 26% of the population, followed by the Evangelical Lutheran (18%) and Seventh-Day Adventist (13%) denominations. Less than 2% of the population identified as non-Christians, and 3% did not indicate a religion in the 2011 Census. Non-Christians include the Mormons, Jehovah's Witnesses and those of the Baha'i faith. Because of the missionary influences in the past (Turner, 2001), there are major concentrations of particular Christian denominations in some provinces. For example, in the 2011 Census, 68% of the people in the Autonomous Region of Bougainville identified as Roman Catholic, 67% in the Morobe Province identified as Evangelical Lutheran and 61% in the Northen (Oro) Province identified as Anglican (National Statistical Office, 2011).

Prior to colonisation, some ethnic groups in PNG had a distanced approach to worshipping a higher being (Manineng, 2019). For instance, the Huli people of the Highlands practised the

worship of a deity referred to as Datagaliwabe in their native language (Wakia, 2016). Datagaliwabe was regarded as the source of all things, similarly to how Christians describe God as the 'alpha and omega' (Arabagali, 2022). Therefore, Arabagali (2022) asserted that Christian worship was seamlessly embraced into Huli culture because of this parallelism. The Huli were able to rationalise that what the Christians, predominantly the Catholics, sought to establish was essentially the same as what they had been practising. However, this time, it would be formalised and led by specially trained priests and missionaries. A good example of the parallels between Christian beliefs and cultural norms (practice) is the expectation to abstain from premarital sex. Christians believe that sexual intercourse outside of marriage is a sin (fornication), while in many traditional societies in PNG premarital sex reduces the bride price and family wealth. While this a common approach to understanding the acceptability of sex before marriage, this is not a uniformly held belief system. For example, in the Trobriands, there are times when sex between young unmarried people is sanctioned (Lepani, 2012)

1.6.4 Politics

PNG's political system operates on a parliamentary representative democratic multi-party model. The prime minister is the head of government, and the country is a sovereign Commonwealth nation with the monarch as the head of state. The monarch is represented by a governor-general nominated by the National Parliament of PNG and receives guidance from the prime minister and the Cabinet. The members of the Cabinet, known as the National Executive Council (NEC), include the prime minister and the ministers of executive departments, and they are accountable to parliament. The prime minister, elected by the parliament, is responsible for selecting the other Cabinet members (Department of Foreign Affairs and Trade, 2023; Howes & Pillai, 2022).

The National Parliament is a single-chamber legislature responsible for creating laws in PNG. It consists of 89 members elected from open electorates and 22 governors elected from provincial electorates. There are currently two women in the parliament; PNG is one of the only three countries worldwide with such limited female representation (Sepoe et al., 2022). Citizens aged more than 18 years can directly vote for a total of 111 members who represent the PNG provinces and districts. After an election, the political party with the most seats is invited by the governor-general to form a new government. According to the PNG Constitution, the maximum term of a parliament is five years (Kabuni et al., 2022).

Prime Minister and the National Executive Council

All executive power within the government is held by the NEC, which includes all state ministers. Unlike Australia, where the Cabinet is responsible for political decisions and the Federal Executive Council handles formal decisions, the NEC follows the model of the Cabinet and makes policy decisions (Department of Foreign Affairs and Trade, 2023). The NEC must always consist of at least a quarter of the parliament's total number of ministers. A Secretary to the NEC is responsible to the prime minister and oversees the council secretariat (Kabuni et al., 2022).

As in other Commonwealth nations, in PNG, the party or coalition that holds the majority of seats in parliament is invited by the governor-general to form a government. The winning party's leader becomes the prime minister and subsequently appoints the Cabinet from among fellow parliament members (Kabuni et al., 2022).

Role of Governor-General

The governor-general appoints the Chief Justice of the Supreme Court, after taking advice from the prime minister and the opposition leader. Similarly, the governor-general chooses other court judges with the assistance of a judicial commission. The highest appellate court is the Judicial Committee of the Privy Council, and the National Parliament is the unicameral national legislature in the country. It was created in 1964 as the House of Assembly of Papua and New Guinea but gained its current name after the nation attained independence in 1975.

The government has executive power, while legislative power is vested in the government and parliament. Constitutional safeguards include freedom of speech, press, worship, movement and association. The judiciary operates independently of the executive and legislature (Kabuni et al., 2022).

Function of Health Ministry

The PNG Government, under the leadership of the Minister for Health and HIV/AIDs, governs the function of the Health Ministry through the NDoH. The NDoH provides leadership, advocacy and coordination for the PNG's health sector guided by a corporate plan. For instance, the Corporate

Plan 2022–2026 is a strategic guide for the NDoH to establish and strengthen relationships with various stakeholders towards achieving the objectives of the National Health Plan 2021–2030.

Function of Ministry of Higher Education, Research, Science and Technology

The Ministry of Higher Education, Research, Science and Technology operates under the Department of Prime Minister and the NEC. The functions of this ministry are governed through the Department of Higher Education, Research, Science and Technology (DHERST, 2021). The head of the DHERST is the Secretary for Higher Education, Research, Science and Technology, an appointed government officer.

The Secretary of the DHERST reports directly to the Minister of Higher Education, Research, Science and Technology. Their primary responsibility is to provide strategic leadership and ensure the provision of effective and efficient corporate and support services to the minister, the NEC, ministerial committees and the DHERST (2018).

The *Public Service Management and General Orders Act* mandates certain services that are administered through executive divisions and supported by four divisional wings. This strengthens the operational links between the departments, the PNG Government and the PNG higher education sector. The executive team is committed to maintaining regular high-level political contact within the government, as well as supporting the minister's and secretary's relationship with the department (DHERST, 2018).

1.7 Healthcare Services

PNG faces challenges in providing primary healthcare services because of its geographic remoteness, rugged terrain and diverse population. Understanding the structure and delivery of primary healthcare in PNG is necessary to understand the challenges of accessing these vital services. Here, I present information about the primary healthcare system in PNG, beginning with a brief history, followed by the healthcare system structure, workforce and service delivery.

The hyper-diverse peoples of PNG had their own traditional beliefs about the cause of diseases and ways of treating them, and in many ways, they still do (Pilang et al., 2017). Before colonisation, traditional health knowledge and skills were passed orally from generation to

generation, and only those competent in these practices were allowed to attempt specific cures and rituals (Manineng et al., 2017; Pilang et al., 2017). Explanations about the causes of diseases vary among the different cultural groups (Sharp, 1982). For example, some cultural groups believe that the spirits of dead relatives cause serious illness, and others believe that sorcery and the breaching of traditions and cultures lead to disease and death (Lepowsky, 1990; Sharp, 1982). Diseases were (and still are) treated using local herbs and remedies and the sacrifice of animals based on the perceived origin of the disease (Hauck, 2010; Pilang et al., 2017). Because of the verbal and observational way of acquiring traditional health knowledge and skills, information is lost when a traditional healer dies, if it has not already been passed on by word-of-mouth. Currently, many traditional beliefs about the origin of illness and about healing practices have been lost or replaced by modern medicine, but some traditional practices are still combined with Western diagnosis and treatment (Lepowsky, 1990; Pilang et al., 2017; Sharp, 1982).

With the arrival of the foreigners to PNG, the focus of these explorers, and traders were mostly economic and political. There was little interest in the health and wellbeing of the Indigenous population despite the foreigners introducing infectious diseases such as measles, smallpox, dysentery and tuberculosis (Maddocks, 1974, 1975; Pilang et al., 2017). Western healthcare services were initially available only to foreigners, and to the few PNG labourers who were used for commercial enterprise. However, over time, Western healthcare was provided more broadly to combat the spread of infectious diseases and to gain the support and confidence of the people of PNG (Lepowsky, 1990; Pilang et al., 2017; Sharp, 1982). Thus, Western healthcare diagnosis and treatment for the Indigenous population began to be delivered alongside existing practices of traditional medicine. According to Pilang et al. (2017), Western doctors from the missions and colonial governments begun training local PNG men in 1903 to administer intravenous injections and other primary health treatments although these men were unable to read and write. These first PNG healthcare workers were called medical *tul-tuls*, *liklik* doctors or doctor boys.

Prior to PNG's independence in 1975, the public healthcare system under the colonial administration of Australia operated under centralised governance (Grundy et al., 2019). Following independence, the NDoH was established. Healthcare service delivery continued under centralised governance until the creation of the Provincial Health Authorities (PHAs) following the passing of the *Provincial Health Authorities Act* in 2007 (Howes et al., 2022).

The PHA in each province is now responsible for the operations of the primary healthcare facilities and programs (Compos-Outcalt & Newbrander, 1989). For example, PHAs have increased flexibility to manage their staff and finances per the needs of the local population, while relying on the funds from the government to deliver these services (Howes et al., 2014; NDoH, 2021).

Primary healthcare services in PNG are provided through a hierarchical structure of six levels of healthcare facilities organised in a pyramidal fashion with Level 1 Community Health Posts, Level 2 Health Centres, Level 3 District Hospitals, Level 4 Provincial Hospitals and, the highest, Level 5 National Referrals Hospital in Port Moresby, the capital city of PNG (NDoH, 2023; Wiltshire et al., 2020; WHO, 2020). A recent NDoH (2023) report revealed that PNG has 40 community health posts, 732 health centres, 14 district hospitals and 21 provincial hospitals. Health centres offer various services, including outpatient care, maternal and child health care and basic diagnostic facilities. District hospitals provide more specialised care and serve as referral centres for health centres (Grundy et al., 2019)

Primary healthcare services in PNG are largely provided by either the government-run systems or Christian churches (Grundy et al., 2019). Church-run health facilities play a crucial role in the country's health system and deliver nearly half of the primary healthcare services nationwide. Although these facilities operate somewhat independently from government-run facilities, they receive substantial financial support from the government; approximately 80% of the operational costs of church-run facilities are subsidised by the PNG Government (Wiltshire et al., 2020).

The health workforce in PNG includes medical doctors, dental professionals, health extension officers, nurses, midwives, community health workers, pharmacy professionals, medical laboratory staff and allied health professionals (WHO, 2020). The country faces a shortage of trained health professionals, given its aging workforce particularly in rural and remote areas (Grundy et al., 2019). Improvement in the deployment and management of the health workforce is a concern because of the uneven distribution of healthcare providers across provinces. For example, the National Capital District has the highest proportion of healthcare providers and the Western Province the lowest (WHO, 2020). Health extension officers and community health workers serve 87% of the total PNG population of 7.8 million living in rural and remote settings (Grundy et al., 2019; Pilang et al., 2017; WHO, 2020).

Primary healthcare funding is derived from government allocations, donor support and out-of-pocket patient payments. The government is the primary contributor to healthcare funding, and donors cover 21% of the government-managed healthcare system costs (Grundy et al., 2019). PNG partners with international organisations, non-government organisation, faith-based organisations and bilateral partners to strengthen its primary healthcare system. Australia provides the majority of donor funds, but other donors have increased their aid in recent years (WHO, 2020). These partners provide financial assistance, technical expertise and capacity-building support to improve healthcare delivery and address public health challenges (Grundy et al., 2019)

To promote the use of healthcare services, the government has implemented a policy of free primary healthcare and subsidised specialist services. Primary healthcare services provided by the government or church-run aid posts and health centres should be freely accessible. User fees are only required for certain specialised hospital services. However, delays in the disbursement of funds to frontline health facilities means many centres experience delays, which affects the implementation of the free healthcare policy (Grundy et al., 2019).

Despite the decentralised governance of the healthcare system to serve the local populations' health needs, PNG has consistently faced health challenges, such as a high burden of communicable diseases including malaria, tuberculosis, and STIs including HIV. These service delivery challenges can be attributed to declines in the quality of health service delivery (Howes et al., 2014, 2022). In addition, the country has widespread social problems, including high rates of teenage pregnancy, and its unacceptable high rate of maternal mortality remains unchanged (Howes et al., 2022). Furthermore, the incidence of non-communicable diseases such as diabetes and cardiovascular diseases are increasing, which further strains the healthcare system (Grundy et al., 2019; WHO, 2020)

1.7.1 Sexual and Reproductive Healthcare Services in Papua New Guinea

Papua New Guinea has a national SRH policy design to create an enabling environment to improve all its citizens' quality of life by reducing morbidity and mortality among the sexually active population (NDoH, 2013). The components of the SRH policy that relate to young people are shown in Figure 1.2.

- Promotion of healthy sexual maturation as from pre-adolescence, responsible and safe sex throughout the lifetime, gender equity and equity
- Elimination of harmful practices such as early marriage, domestic and sexual violence against women
- Family planning counselling, information, and services
- Prevention and management of complications of abortion
- Provision of safe abortion services where the law permits.
- Prevention and management of reproductive tract infections, especially STIs, including HIV infections.
- Parental care, safe delivery, essential and emergency obstetric care, perinatal and neonatal, postnatal care, and breastfeeding
- Preventions and management of infertility and sexual dysfunction in both men and women

Figure 1.2: Components of Papua New Guinea Sexual and Reproductive Health Policy (National Department of Health, 2013, p. 132)

The SRH policy objective for user-friendly services allows sexually active young people, regardless of their marital status, to access family planning (contraceptive) information, condoms and hormonal contraceptives at the family planning (antenatal) clinics. The SRH services provided by the government through PHAs within the hospital settings are obstetrics and gynaecology services, family planning (antenatal) and STI clinics (NDoH, 2013). Other SRH services are provided by non-government organisations. Marie Stopes PNG provides a range of short-term, long-term and permanent methods of contraception as well as counselling to understand lifestyle preferences and needs, medical eligibility and future pregnancy aspirations. During the COVID-19 pandemic, the International Planned Parenthood Federation supported PNG Family Health Association and extended essential SRH services from its static clinics in hard-to-reach communities through mobile clinics (International Planned Parenthood Federation, 2022). this section, I have briefly described the history, structure and delivery of the healthcare system in PNG. Next, I discuss the structure of its higher education system, which is relevant since this study explores factors that influence the SRH of the country's young people who are in tertiary education settings.

1.8 Lower Education System in Papua New Guinea

The formal education system in PNG comprises several lower levels, including elementary (prep, Grades 1 and 2), primary (Grades 3–8), lower secondary (Grades 9 and 10) and upper secondary schools (Grades 11 and 12; Department of Education, 2017). To advance from Grades 7 and 8 to Grades 9 and 10, as well as from Grade 10 to Grades 11 and 12, students are required to pass a national examination. Students reaching Grade 12 must take another national

examination to secure a place in tertiary education institutions, including universities and technical education institutions The stringent selection and examination process ensures that only the most qualified students gain admission to universities. Parents and extended families often provide financial support to university students, recognising that their investment in education will benefit not just these students but also the family as a whole once these students complete their course.

1.9 Higher Education in Papua New Guinea

The DHERST (2022) is responsible for the coordination of higher and technical education, research, science and technology.

In 2017, PNG's NEC directed that post-secondary educational institutions transfer their regulatory system to DHERST. This means that most tertiary institutions are now regulated by the DHERST (2022), guided by the *Higher and Technical Reform Act 202*0. This transfer to the DHERST was made possible by amending the *Higher Education (General Provision) Act 2020*. The approval of DHERST's (2022) transition to a five-year Higher and Technical Education Sector Plan and Budget (2021–2025) through NEC Decision NG179/2019 marked a significant step towards the funding of higher education institutions. This transition involved a shift from the current fragmented funding systems of universities, teacher colleges, nursing colleges, technical and business colleges and various church-run colleges to a unified, organised sector-wide funding system. Next, I present a brief history of higher education in PNG, followed by an introduction to each of the established universities operating in PNG.

1.9.1 Brief History of Higher Education in Papua New Guinea

After World War II, the Australian colonial administration directed resources towards formal primary education in PNG (McGavin, 1991). In the early 1950s, it also established secondary education using the Australian curricula. The United Nations supervised all these education developments through a committee on non-self-governing territories. During the early 1960s, in preparation for PNG's self-government and independence, the Australian colonial administration established diploma-level medical and dental schools and allowed churches to establish seminaries, teachers' colleges and various vocational and technical training institutes (McGavin, 1991).

In 1959, the colonial administration assessed the effectiveness of their training arrangements with the University of Queensland and formed an inquiry to explore further opportunities for training national officers in the upper levels of the Public Service of PNG (Pacific Institute of Leadership and Governance, 2022). The findings of this inquiry resulted in the Willoughby Report of 1961, which recommended the establishment of a specialised residential institute for advanced training in finance and related fields, practical training in clerical and administrative methods, community development and library work. An interim council was formed in 1962–1963 to plan the development of the Administrative College, which was eventually founded in August 1963. Courses commenced the following year (Pacific Institute of Leadership and Governance, 2022). The Pacific Institute of Leadership and Governance, as the Administrative College is now known, still plays a unique role in providing vocational, diploma and degree-level training tailored to the specific needs of employers in the public sector (Pacific Institute of Leadership and Governance, 2022).

In addition to the Pacific Institute of Leadership and Governance, at present, there are eight universities in PNG. In the early post-independence years, tertiary institutions reflected ideas then current in Australia, where universities were being developed as centres of diverse teaching and research and new colleges or institutes of advanced education were being formed to prepare graduates in professional areas, such as teaching, accounting and engineering (McGavin, 1991).

1.10 Study Population

The target population for this study are unmarried young adults aged 18 to 30 year who were born and raised in one of the twenty-two provinces of PNG. Young adults are a subset of young people who are transitioning between adolescence and adulthood. In PNG, young adults, adolescents, and children make up 60% of the population, a significant proportion contributing to the Pacific region's youth bulge (Lee, 2019). Unlike children and early adolescents, young adults in PNG are often referred to as youth (Lee, 2019). Youth in the PNG context are individuals recognised as unmarried and often live within their communities as dependents, relying on their parents and extended families for shelter, food and security (Hukula, 2017). In exchange, youths are expected to adhere to familial and societal norms and contribute to the maintenance of harmony within both the family and the broader community through their labour or financial support. In this thesis, I refer to PNG’s youth as young adults.

Young adults in PNG and the neighbouring Pacific Island countries and territories (PICTs) constitute a reservoir of potential (Miller, 2013). They contribute to community development, shape lives, and form identity, distinguishing their contributions from those of children and early adolescents. Therefore, it is essential to guide and empower these individuals so that they can make informed decisions, take proactive measures, and assume responsibility for their futures. However, the potential of young adults in PNG is often not fully realised. Young adults face various social and economic challenges that hinder their ability to thrive and contribute positively to society (UNFPA, 2024).

Factors contributing to the social and economic challenges faced by young adults include insufficient access to formal education, a lack of appropriate facilities and activities, limited opportunities for vocational training and high unemployment rates (UNFPA, 2024). In rural communities, many young adults do not complete primary and secondary education due to a shortage of teachers and teaching resources compared to urban communities. The recent PNG Demographic Health Survey revealed that one-third of women and one-quarter of men aged six and older have never attended school (National Statistical Office, 2019). Those who completed formal education often struggle with communication skills because they are taught in local vernacular languages (Tok Ples) or Tok Pisin (PNG's lingua franca). This limits their ability to find jobs in the scarce formal employment market. Also, many young adults with formal education are further hindered from securing formal paid employment due to widespread corruption and nepotism (Melpa, 2022).

Insufficient access to formal education is further exacerbated by gender injustice. Gender injustice refers to the unequal treatment of individuals based on their gender (Douglas, 2007). In PNG, many girls and young women are not given equal opportunities for formal education because of societal preferences that prioritise the dominance of boys and men in all aspects of life (Goro, 2021). This preference is rooted in the predominantly patrilineal structure of society across PNG's nineteen provinces, compared with only a small number of matrilineal communities in three provinces. Consequently, boys and men benefit from improved access to formal education and are more often positioned in higher-status roles, while girls and women are frequently assigned roles that are viewed as less valuable. Furthermore, girls often start elementary school at an older age, usually around eight or nine. Many do not complete primary education due to the onset of menarche and a lack of menstrual hygiene facilities in schools (Goro, 2021). Cultural taboos surrounding menstruation can lead to girls missing classes and

ultimately dropping out (Maulingin-Gumbaketi et al., 2022). Also, sexual harassment by older male students has been shown to discourage girls from attending school (Wilson, 2019; Goro, 2021).

Limited opportunities for vocational training and the high unemployment rate among young adults have made many feel they cannot contribute meaningfully to their communities. As a result, many felt disengaged, and some turned to criminal activities and acts of violence, including rape, prostitution and the use of drugs. Also, the lack of age appropriate sexual health facilities and activities is among the causes of the higher rate of teenage pregnancies and higher pregnancy-related mortality and morbidity among young women in PNG (Agyekum et al., 2022). Without investments in the wellbeing of this population, their potential to contribute to this nation's development will not be realised. Thus, this study contributes to enhancing young adults' wellbeing, especially for young women, by describing their SRH needs and challenges, focusing on individuals in tertiary education.

1.11 Study Setting

There are currently eight universities operating in PNG (see Figure 1.3), five and two of which are run by the government and the church, respectively. The eighth university is a business entity, that is, a chartered university. I present a brief description of these universities, beginning with the oldest, more established institutions through to the most recently established ones.

Figure 1.3: Locations of universities in Papua New Guinea

1.11.1 University of Papua New Guinea

The University of Papua New Guinea (UPNG) was established by the Australian colonial administration in 1966, and its main campus is located in Port Moresby, National Capital District. The first group of students graduated from UPNG in 1970. This university has five schools and open campuses throughout PNG, which offer 53 undergraduate and 33 postgraduate programs (DHERST, 2022).

Every year, more than 15,000 students attend the different campuses of the UPNG. Most students are from PNG, but there are also international students from other Pacific Nations, with a significant number from the Solomon Islands. Interestingly, the UPNG School of Law is the only law school in PNG. The School of Business and Public Policy provides master's programs in business administration and in economics and public policy programs. On-campus accommodation is made available to students who require it, and boarding fees are charged

accordingly. Alternatively, students may choose to reside off campus and pay only their tuition fees (UPNG, 2023).

1.11.2 Papua New Guinea University of Technology

Papua New Guinea University of Technology (UNITECH) was established two years after UPNG as its sister university. The university is in Lae, Morobe Province, and provides 31 postgraduate and 30 undergraduate programs (DHERST, 2022). While UPNG teaches arts, pure science, law and medicine, this university focuses on research and teaching technological or applied subjects (Papua New Guinea University of Technology, 2023b).

The university also welcomes 100 international students from neighbouring PICTs every year (Papua New Guinea University of Technology, 2023a). It offers undergraduate and postgraduate programs in agriculture, applied physics and science, architecture and construction management, business studies, communication and developmental studies, civil, mechanical, mining, electrical and communication engineering, mathematics and computer science, surveying and land studies. Similarly to the UPNG, the university provides on-campus accommodation for students who require it (Papua New Guinea University of Technology, 2023a).

1.11.3 University of Goroka

The University of Goroka is in Goroka, Eastern Highlands Province. It is the third largest of the eight universities in PNG and the largest teacher education institution. In 1997, the university was established by merging two faculties of the UPNG, namely, Goroka Teacher's College and the Faculty of Education. Since then, it has undergone integration and expansion, which has facilitated the continuous review and enhancement of its programs. The university provides a range of teaching training programs, including pre-service and in-service programs and diploma and postgraduate programs. These programs cater to primary and secondary teachers, primary teacher educators and educational administrators (University of Goroka, 2021).

1.11.4 Divine Word University

Divine Word University (DWU) is a privately owned institution operated by Roman Catholic Divine Word Missionaries. It was founded in 1996 through parliamentary legislation and has

four campuses, one each in East New Britain Province, East Sepik Province, National Capital District and Madang Province. Its main campus is in Madang Province. DWU has five faculties—arts, business and informatics, education, health sciences and theology—and it offers undergraduate, master's, and Doctor of Philosophy (PhD) programs. It offers training programs for health extension officers, physiotherapists and, since recently, medical doctors. DWU places great emphasis on providing equal opportunities for higher education to learners of all genders. Its mission is to deliver quality education, research and community engagement underpinned by Christian values. The majority of undergraduate students are provided with on-campus accommodation (DWU, 2018).

1.11.5 Pacific Adventist University

Pacific Adventist University (PAU) is situated 14 miles away from Port Moresby City. The Seventh-Day Adventist Church owns and operates this university. It was founded in 1984 and originally known as Pacific Adventist College. In 1997, the PNG Government passed the *Pacific Adventist University Act* (Act No.34, 1997) and granted it university status. PAU offers bachelor's and master's degrees in various fields, including business, education, science, health science (nursing), theology and humanities. It enrols more than 1,000 students from various parts of PNG and the PICTs. While the main campus is just outside Port Moresby, the capital of PNG, PAU also has a campus in the East New Britain Province (Sonoma Adventist College) and one in the Malaita Province of the Solomon Islands (Atoifi Adventist Nursing College). The university is committed to providing quality education to its students in a Christian-friendly environment. Similarly to other universities in PNG, PAU offers on-campus accommodation to its students. Married students are provided houses in student villages and are encouraged to live with their spouses (PAU, 2021).

1.11.6 Papua New Guinea University of National Resources and Environment

The Papua New Guinea University of Natural Resources and Environment is in East New Britain Province. It was founded in 1965 as Vudal Agricultural College, a male-only college under the Department of Agriculture, Stock, and Fisheries (Papua New Guinea University of Natural Resources and Environment, 2023). In 1975, the college began enrolling female students. It provided a two-year certificate and three-year diploma training in tropical agriculture. In 1992, it was merged with the Papua New Guinea University of Technology. However, in 1997, the college was transformed into an independent higher education

institution, known as the University of Vudal, through an Act of Parliament passed in January 1997.

In 2005, Sir Julius Chan, the former prime minister of PNG, and the current Governor of New Ireland Province, led the university's council to change its name to Papua New Guinea University of Natural Resources and Environment and expand its focus from a single-discipline institution to a multi-discipline one with an international presence. Currently, this university provides a range of undergraduate programs in agriculture, fisheries and marine resources, tropical forestry, livestock production and international tourism. It provides on-campus accommodation for its students who require it (Papua New Guinea University of Natural Resources and Environment, 2023).

1.11.7 Institute of Business Studies University

The Institute of Business Studies University (IBSU) is in Port Moresby, previously known as the Institute of Business Studies (IBS). It provides academic and professional courses in accounting, business, and information technology. Initially, the institute offered revision classes for the Papua New Guinea Institute of Accountants (PNGIA) professional exams when no such classes were available. At its founding, there were only nine qualified Papua New Guinean accountants out of more than 300 Commerce/Accounting graduates from UPNG and Unitech.

In response to the demand for Certificate Courses among Grade 10/12 School Leavers, IBS created a Certificate in Accounting program in 2002. This program was based on the syllabus of Accounting Technicians of the United Kingdom. The Certificate in Computing course was established the following year, and both programs became the foundation of IBS. Many school leavers enrolled in these courses at Saraga Campus, leading to IBS becoming a Study Centre of UPNG in 1995. In 1995, IBS offered the two-year Diploma in Commerce (Diploma in Accounting) until 2016. In 1999, IBS partnered with Southern Cross University to offer bachelor's degree programs in Business and Information Technology through an educational collaboration agreement.

1.11.8 Western Pacific University

On April 24th, 2015, the NEC of PNG approved the creation of a new university in the Ialibu Pangia District located in the Southern Highland Province (NEC Decision No.299/2013). The

Western Pacific University was built on customary land adjacent to Ialibu Township, and the land acquisition process was successfully concluded in 2016. As a newly established university, Western Pacific University commenced its academic journey in 2021 with an inaugural cohort of forty students. The university offers foundational studies alongside degree programs in several disciplines, including Arts in International Business Management, Science in Computer Programming, Science in Computer Networks, and Science in Cybersecurity.

1.12 University Policies Regarding Romantic Relationships and Pregnancy

All universities in PNG prioritise the wellbeing of their students through various institutional policies, including those related to romantic relationships (and staff), marriage, pregnancy and wellbeing. Policies are defined as written statements used to guide and determine present and future decisions about standards of care (NDoH, 2014), and procedures are defined as an established way of doing something (Merriam-Webster Dictionary, 2024). These include polices that relate to the intimate elements of a student's life, but that, as in other parts of the Pacific (Mitchell & Bennett, 2020a), reflect dominant social expectations regarding appropriate behaviours by unmarried people in PNG. The public universities have policies that reflect the social and cultural norms of the country. For example, male and female students are accommodated in separate dormitories, but may mingle freely unlike in the Christian universities.

PAU (2024), a private Christian university, promotes sexual morality and abstinence outside of marriage in line with Christian values and local cultural norms. It expects students to maintain a respectful environment by not engaging in unacceptable public displays of affection, such as kissing, cuddling and fondling or being alone in dark or isolated locations. Students are advised against getting married during the semester, as the university does not guarantee that it will provide on-campus student accommodation for all married couples. The university does not usually accept married individuals as students if it means the student will be separated from their spouse (PAU, 2023). Similarly, the student pregnancy and pastoral care policy at DWU (2023), a private Christian university, adheres to Christian teachings that advocate marriage as the preferred context for sexual intimacy and childbirth. At DWU, pregnant students must inform the dean of women students on DWU's respective campuses about their pregnancy, specifically the gestational stage, to receive appropriate pastoral care. If a student's pregnancy is within the first trimester (12 weeks), they may finish their current semester and then withdraw from their studies. However, if a female student fails to disclose her pregnancy to the

dean or is dishonest about her stage of pregnancy, she will be automatically withdrawn from her studies for a full academic year if it is discovered. For unmarried students, the customary rights of the student's parents will be respected when making decisions about reenrolment into the university program (DWU, 2023).

This outline of the SRH-related policies of the universities in PNG provides context for the experience of the single (unmarried) student who participated in this study, how the findings were interpreted and how recommendations were generated in this thesis.

1.13 Thesis structure

This thesis is composed of seven chapters.

Chapter 1: Introduction

In Chapter 1, I outlined the context of this study, beginning with the research problem, aim, and objectives. I also explained how this study will contribute to achieving PNG's development vision (Vision 2050) and provided a brief background about PNG, including its people, culture and population, religion and society, and politics. I also described PNG's healthcare and lower and higher education services.

Chapter 2: Literature Review

In Chapter 2, I presented the literature review conducted as a scoping review about young people's barriers and enablers to accessing sexual and reproductive health services in Pacific Island Countries and Territories. The findings were published in PLOS One Journal on 26 January 2023.

Chapter 3: Methodology and Methods

In Chapter 3, I described my philosophical stances and reasons for applying the explanatory sequential mixed method study design for data collection, analysis, and reporting. I described the steps taken to collect quantitative and qualitative data and how these two data sets were integrated to arrive at mixed methods results.

Chapter 4: Results

Chapter 4 is the first results chapter. I present the first set of integrated results related to objective one, which was to describe SRH knowledge and practices of university students. This chapter is written as a journal article manuscript intended for publication.

Chapter 5: Results

Chapter 5 outlines the results that address the second and third objectives of the study. These objectives aimed to explore the social and cultural factors affecting university students' SRH, including the barriers and enablers to accessing SRH services and their effects on course completion. Similar to Chapter 4, this chapter is structured as a manuscript intended for journal publication.

Chapter 6: Discussion

In Chapter 6, I situated and discussed this study's results using the Socio-Ecological Model. The discussion begins at the intrapersonal level and progresses to interpersonal, institutional, community, and public policy levels. Similarly, recommendations were made based on intrapersonal through to the public policy level. I also outline the steps taken to ensure the quality of the research findings and present this study's strengths and limitations and the conclusion.

Chapter 7: Reflection on My PhD Journey

In chapter 7, I present my reflection as a PhD candidate using the analogy of a butterfly's life and ending with the epilogue.

1.14 Chapter Summary

In this chapter, I have presented the context, rationale and justification for undertaking this study along with a summary about PNG's specific characteristics, including information on the country, the health system, the higher education system and specific policies that influenced the study design and the interpretation of results.

In the following chapter, I present a scoping review conducted to examine existing literature, in order to inform this study. This review was published on 26 January 2023 in *PLOS ONE*.

Chapter 2: Literature Review

2.1 Chapter Overview

To research the SRH of young tertiary students PNG, I first needed to review the existing literature about the access of young people to SRH health services. This process helped me to identify the current knowledge and areas with the knowledge gaps. After conducting a literature search specifically for PNG, I realised there was limited literature on the narratives of young people's SRH challenges. Therefore, I expanded the scope of my research to include other PICTs in order to provide a more comprehensive analysis of the SRH issues faced by young people in the region.

I conducted the literature review during the COVID-19 pandemic lockdown, meaning the search was limited to online databases and publications. The published literature review (see Figure 2.1) is included verbatim in this chapter.

Figure 2.1: Scoping review details

RESEARCH ARTICLE

Barriers and enablers to young people accessing sexual and reproductive health services in Pacific Island Countries and Territories: A scoping review.

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2.2 Abstract

Background: The number of young people utilising sexual and reproductive health services in Pacific Island Countries and Territories remains poor despite the availability and the existence of the fundamental rights to access these services. Adolescents and youths need accurate information and timely access to contraceptives to prevent adverse consequences of unintended pregnancies, abortion, childbirth, and untreated sexually transmitted infections. This scoping review identifies and analyses factors contributing to young people's low access to sexual and reproductive health services in this region.

Methods: Guided by the PRISMA Scoping review guidelines, we searched three databases (Medline Ovid, Scopus and CINAHL Complete) for peer-reviewed articles published between 1st January 2000 and 31st August 2020 that reported on factors, including barriers and enablers, affecting access to sexual and reproductive health services by young people living in Pacific Island Countries and Territories. We assessed the quality of each study according to the study designs, methods of data collection, data analysis and ethical considerations. All information were sorted and organised using an Excel Spreadsheet. Text data from published articles were charted inductively using thematic analysis with no predetermined codes and themes.

Findings: Five hundred eighty-nine articles were screened, and only eight met the inclusion criteria outlined in this scoping review protocol. These eight articles reported studies conducted in four Pacific Island Countries and Territories: Cook Islands, Fiji, Papua New Guinea, and Vanuatu. Factors such as lack of accurate sexual and reproductive health knowledge and social stigma were the leading causes of young people's limited access to sexual and reproductive health services. Cultural and religious beliefs also invoked stigmatising behaviours in some family and community members.

Conclusion: This scoping review revealed that social stigma and judgemental attitudes imposed by family and community members, including healthcare providers, hinder young unmarried individuals in Pacific Island Countries and Territories from accessing sexual and reproductive health information and contraceptives. But on the other hand, a non-judgmental healthcare provider is perceived as an enabler in accessing sexual and reproductive health information and services**.** Moreover, given that only a few studies have focused on young people's sexual and reproductive health needs in the region, more research is required to fully understand the health-seeking behaviours of young people in their specific contexts.

2.3 Introduction

Timely access to sexual and reproductive health (SRH) information and services by young adults in Pacific Island Countries and Territories (PICTs) remain low despite the availability of SRH services (Harrington et al., 2021). Globally, young adulthood is a critical time of development where many opportunities and challenges exist. One such challenge is access to healthcare services (The Society for Adolescent Health and Medicine, 2017). The Society of Adolescent Health and Medicine has identified from over 40 publications in the United States that young adults (between 18 and 25 years of age) experience higher rates of mortality, and unintended pregnancies and have lower access to healthcare services compared with those immediately younger (10–17 years of age) and those immediately older (26-30 years of age) (The Society for Adolescent Health and Medicine, 2017). Moreover, with unique sexual health needs, young adults need accurate information and timely access to contraceptives to prevent adverse consequences of unintended pregnancies, abortion, childbirth and untreated sexually transmitted infections (STIs) (United Nations Population Fund, 2020; World Health Organization, 2018, 2020, 2023c).

In the Pacific region, multiple factors determine people's access to SRH information and services, including culture, economic and geographical location (Secretariat of the Pacific Community, 2015). For example, a report aimed at better understanding Papua New Guinea's allocation and spending of public funds; found a shortage of healthcare providers, delay or lack of funding, including payments of healthcare providers, and a limited supply of drugs (Howes et al., 2014) hinders service delivery and accessibilities. People most likely to experience difficulties accessing SRH services are those living in rural and remote areas and populations with specific needs, such as young people, persons with disabilities and people living with HIV and LGBTQI (Secretariat of the Pacific Community, 2015). Consequently, the global effects to ensure SRH rights to quality and accurate SRH information and services are undermined (Sciortino, 2020), resulting in instances such as low contraceptive prevalence rate and high unmet need for contraceptives among young sexually experienced women in some PICTs (United Nations Population Fund, 2013).

Unintended pregnancies and STIs are common among young women (Clarke & Azzopardi, 2019). In five PICTs (Papua New Guinea, Solomon Islands, Vanuatu, Nauru and the Marshall Islands), young women's fertility rates remain high, at over 50 live births per 1,000 women aged 15-19 years (United Nations Population Fund, 2013). It is widely acknowledged that

many unintended pregnancies are terminated using unsafe abortion practices (Secretariat of the Pacific Community, 2015), as evidenced in studies from Papua New Guinea (L. M. Vallely et al., 2014; Vallely et al., 2015). The most prevalent STI among young women in the Pacific region is *Chlamydia trachomatis*. A study of 1,618 pregnant women in six PICTs (Fiji, Kiribati, Samoa, Solomon Islands, Tonga, and Vanuatu) between 2004 and 2005 shows that 26.1% and 11.9% of women under 25 years and women aged 25 years, respectively, were infected with *Chlamydia trachomatis* (Cliffe et al., 2008). In Fiji, a recent study shows that 38.8% of young women aged 18-24 years were infected with *Chlamydia trachomatis* (Takeshi et al., 2020), while in the Solomon Islands, the prevalence of *Chlamydia trachomatis* was 20% among women aged 16-49 years attending female clinics in Honiara (Marks et al., 2015).

Several studies have previously explored young people's sexual risk behaviours in PICTs (Mitchell & Bennett, 2020b; Peltzer & Pengpid, 2016; Suzuki et al., 2006), including the use of condoms and contraceptives (Cammock et al., 2017; Cammock et al., 2018; McMillan & Worth, 2011). Some studies have explored young people's SRH issues related to HIV testing, treatment and prevention (Andajani-Sutjahjo et al., 2018; A Kelly-Hanku et al., 2020; Kelly et al., 2010; MacLaren et al., 2013; Manineng et al., 2017). Other studies have explored access to family planning services and antenatal clinics (Sanga et al., 2014). However, to the authors' knowledge, there has been no systematic review of the literature to determine the perceived barriers and enablers of young adults accessing SRH information and services in the PICTs. Thus, this scoping review seeks to answer two main questions:

1. What has been reported about the SRH of young people in PICTs?

2. What has been reported on young people's perception and practices of accessing and using sexual and reproductive health services?

2.4 Methods

Protocol

A scoping review was conducted following the guidelines for the preferred reporting items for systematic reviews and meta-analysis extension for scoping review (PRISMA-ScR) (Tricco et al., 2018). With the increase in the number of published scoping reviews and the lack of consistency in the methodology and reporting of results, the PRISMA-ScR checklist was developed following the guidelines of Levac, Colquhoun and O'Brien (Levac et al., 2010), who

built upon the scoping review methodology of Arksey and O'Malley (Arksey & O'Malley, 2005). A protocol was written (unpublished; Appendix S1) to guide the search for both qualitative and quantitative studies that would help answer our review questions. Medline (Ovid), CINAHL Complete and Scopus databases were searched using keywords and medical subject headings (MeSH) terms between 7th and 18th September 2020 (Appendix S2). These three databases have a comprehensive overview of global literature in the fields relating to human life.

Eligibility criteria

Eligibility criteria are as follows;

1. Peer-reviewed articles that explore young people's responses concerning sexual and reproductive health information and services
2. Articles with young people aged 10 – 24 years as the main study participants living in one of the PICTs, namely American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis and Futuna. Studies of young Pacific Islander adolescents and youth living outside PICTs were not considered based on socio-economic and cultural differences.

We limited our search to include articles published in English between 1st January 2000 and 31st August 2020. We were interested to understand what had transpired in the Pacific region during these twenty years, as there had been targeted SRH service activity linked to the Millennium Development Goals (MDG) and, more recently, the Sustainable Development Goals (SDG). In 2000, the United Nations Member States embarked on eight MDGs to fight poverty and combat issues hampering human development progress (Sciortino, 2020). In these MDGs, goal five aimed to improve maternal health through two indicators; reduction of maternal mortality by three quarters and access to reproductive services.

Data screening and charting process

The literatures identified using keywords and MeSH terms were downloaded into an Endnote library (Version 9) and screened using the established inclusion and exclusion criteria (Appendix S1). After the screening process, we assessed the quality of each peer-reviewed

article in our inclusion list according to the types of study design, methods involved in data collection and analysis and ethical consideration (Joanna Briggs Institute, 2020). We then extracted data from the included studies using a standardised template in an Excel spreadsheet and organised text data according to; the age and gender of the participants, location of the study, study design, method of data collection, ethical consideration and SRH issues such as access to contraceptives and condoms and access to STIs, including HIV treatments. Our text data were analysed inductively using thematic analysis (Braun & Clarke, 2006). The results sections of each included article were read several times for familiarisation with no predetermined codes. Finally, codes were created using NVivo (12 Plus version) software and linked together using thematic maps (Braun & Clarke, 2006) to determine the themes related to barriers and enablers to young people's access to SRH information and services in PICTs.

2.5 Results

Identification of records

Titles and abstracts of 1265 articles were screened, resulting in the exclusion of 1230 articles, with 35 articles considered eligible for full-text screening. After the full-text screening, 27 articles were removed, and the remaining eight were included for evaluation in this scoping review (See figure 1). These are the reasons for the removal of the 1257 articles. Our search had; 676 articles as duplicates; 474 articles had titles with study settings outside of PICTs; 80 articles did not contain information about access to SRH information and services; 13 articles did not have young people aged 10-24 years as study participants, and 14 articles did not specifically report access to SRH services in PICTs.

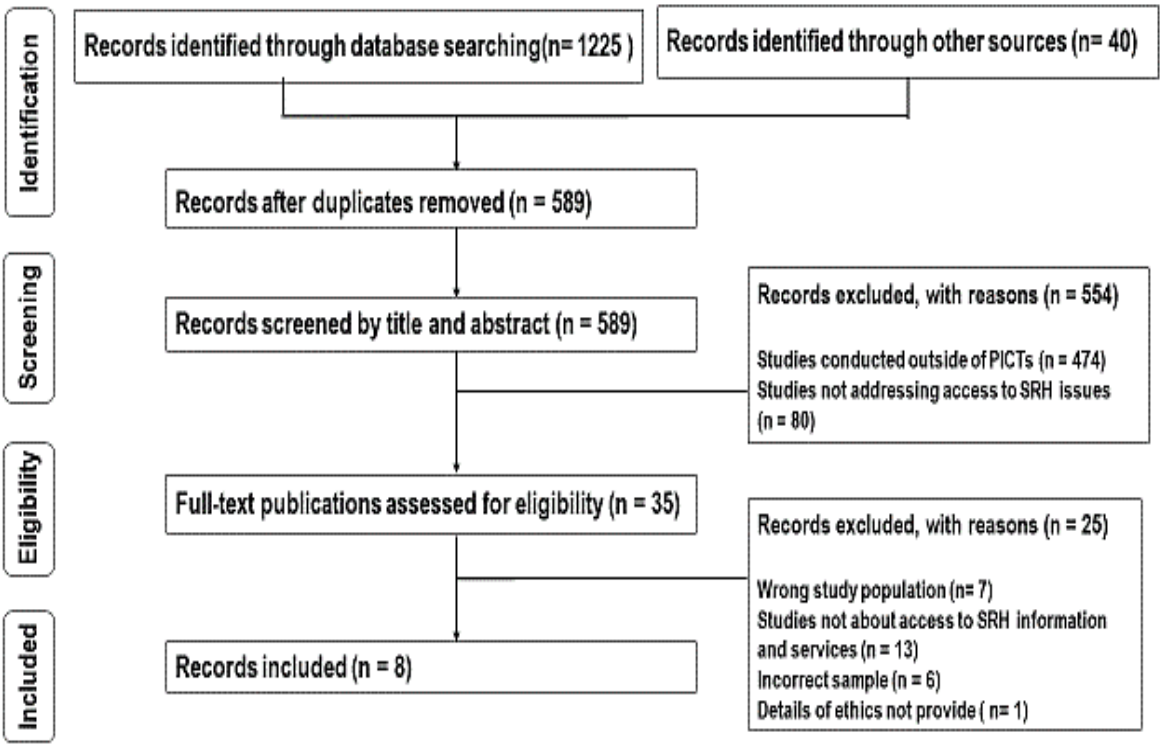

Figure 1. PRISMA-ScR flow diagram of the scoping review process

Characteristics of sources of evidence

The eight articles (Hemer, 2019; Keck, 2007; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; O'Connor et al., 2019; White et al., 2018a, 2018b) included for evaluation were studies conducted in PICTs with young people aged 10 – 24 years as main study participants, and reported on young people's responses of access to SRH information and services, thus meeting the inclusion criteria for this scoping review. Table 1 presents a summary of the studies' characteristics. All eight articles employed a qualitative design, of which two articles (Hemer, 2019; Keck, 2007) were from studies conducted in Papua New Guinea. Two articles (Mitchell & Bell, 2020; O'Connor et al., 2019) were from studies conducted in Fiji, two articles (Kennedy et al., 2013, 2014) were from one study conducted in Vanuatu, and the final two articles (White et al., 2018a, 2018b) were from one study conducted in the Cook Islands.

Four (Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; O'Connor et al., 2019) of the eight articles reported data collected using focus group discussions and semi-structured interviews. In three articles (Keck, 2007; White et al., 2018a, 2018b), data were collected using only semi-structured interviews. The remaining article (Hemer, 2019) reported observation and storytelling as data collection methods. Study participants for six articles (Hemer, 2019; Keck, 2007; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; O'Connor et al., 2019) were males and females, while two articles (White et al., 2018a, 2018b) had females only as study participants.

Two articles reported on young people's barriers and enablers to accessing SRH information and services (Kennedy et al., 2013, 2014). The other six articles reported some elements related to SRH information and services access. Two articles (Hemer, 2019; White et al., 2018a) explored issues of contraceptive use, including access to contraceptive information and services, while two articles (Keck, 2007; O'Connor et al., 2019) reported on HIV knowledge and explored condom use in premarital sex. Two articles (O'Connor et al., 2019; White et al., 2018b) reported on the experiences of young people regarding health-seeking behaviour for SRH information and services.

Table 1. Summary of the included publication.

Citation	Study setting	Type	Study design	Method of data collection	Age range in years (10 -24; ≥ 80% under 24)	Sex	Focus of the study
Hemer (2019)	Papua New Guinea	Peer- reviewed	Qualitative	Lived experience and observation of the author.	15-25	Males Females	Issues of contraception and contraceptive advice and family planning services in an isolated community
Keck (2007)	Papua New Guinea	Peer- reviewed	Qualitative	Semi-structured interviews Author's field notes and observation	15-30	Males Females	HIV/AIDs knowledge, access and usage of condoms among a young rural, remote population.
Kennedy et al., (2013)	Vanuatu	Peer- reviewed	Qualitative	Focus groups discussion and semi-structured interviews	15 - 19	Males Females	Perceptions of youth-friendly sexual reproductive health services
Kennedy et al., (2014)	Vanuatu	Peer- reviewed	Qualitative	Focus groups discussion and semi-structured interviews	15 -19	Males Females	Adolescent's excess sexual and reproductive health information
Mitchell & Bell (2020)	Fiji	Peer- reviewed	Qualitative	Focus group discussion, interviews	18 - 29	Males Females	Understandings of premarital sex and condom use practices among young people in Fiji

O'Connor et al., (2019)	Fiji	Peer- reviewed	Qualitative	Focus group discussion and key informant interviews	15 -19	Males Females	Adolescents' emotional experiences and health-seeking behaviours in Fiji
White et al., (2018a)	Cook Islands	Peer- reviewed	Qualitative	Individual in-depth interview	14 -19	Female	Contraceptive knowledge, attitude and use among young women in the Cook Islands
White et al., (2018b)	Cook Islands	Peer- reviewed	Qualitative	Individual in-depth interview	14 -19	Female	Narrative of young women who become pregnant before the age of 20 years.

Young people's barriers to accessing sexual and reproductive health services

Lack of sexual and reproductive health knowledge

Young people reported not accessing SRH services because they were not aware of such services (Kennedy et al., 2014). For example, information about sex, including SRH services, was not always available to young unmarried men and women in many communities in PICTs because parents believed young unmarried people were too young to receive such information (Kennedy et al., 2013, 2014). Thus, young people also perceived that they were too young to access SRH services (Kennedy et al., 2013). Young people believed SRH services, especially family planning services, were for married men and women and were unavailable to them (Kennedy et al., 2013; White et al., 2018a). In addition, the actions of healthcare providers giving condoms and contraceptives to only married men and women affirmed the perception that only married people were eligible to access family planning services (Keck, 2007; Kennedy et al., 2013).

A lack of understanding about puberty and reproduction has created fear in young people about accessing SRH services. Young men and women stated that not knowing what to ask for or discuss with a healthcare provider was a reason for not accessing a SRH service (Kennedy et al., 2014). As a result, many unmarried individuals have not attended a SRH service (Kennedy et al., 2013; White et al., 2018b). In addition, reports from their friends or other young people about being scolded or lectured by healthcare providers further discouraged their access (Kennedy et al., 2013).

Cultural and religious practices

Lack of SRH knowledge and misconceived ideas about the purpose of SRH services also stemmed from cultural communication practices that restricted intergenerational dialogue between young people, parents, and other adults about sex or sexual health education (Mitchell & Bell, 2020). The notion that premarital sex is taboo and teaching young men and women about sex would encourage them to engage in premarital sex is the basis for which parents, older relatives and other members of communities were reportedly uncomfortable discussing sexual issues with young, unmarried individuals (Keck, 2007; Mitchell & Bell, 2020). Moreover, young individuals and healthcare providers were both reluctant to discuss SRH problems (Kennedy et al., 2013, 2014). Young men and women expressed anxiety when discussing sexual matters and were worried about physical examinations (Kennedy et al., 2013,

2014). Healthcare providers, who are in the position to provide advice and treatment, are uncomfortable discussing sex with unmarried young people (Kennedy et al., 2013, 2014; O'Connor et al., 2019).

Attitudes of healthcare providers

Many young unmarried men and women described healthcare providers as having a judgmental attitude toward them (Keck, 2007; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; O'Connor et al., 2019; White et al., 2018a, 2018b). In nearly all eight studies, participants feared healthcare providers lecturing and scolding them publicly (Hemer, 2019; Keck, 2007; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; O'Connor et al., 2019). In addition, participants do not trust healthcare providers to maintain their privacy, as healthcare providers were among some community members involved in orchestrating their public shame and humiliation (Keck, 2007; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; White et al., 2018a, 2018b). Young people in rural communities feared healthcare providers as some were relatives and neighbours (White et al., 2018a, 2018b).

Location of sexual reproductive health facilities

The location of SRH facilities, such as hospitals and clinics, has encouraged and discouraged accessibility. Young, unmarried people mentioned they preferred accessing SRH facilities that were not within their communities to avoid the judgmental attitudes of people they know (O'Connor et al., 2019). For example, rural adolescents considered urban areas to offer greater anonymity (O'Connor et al., 2019). Furthermore, in many rural communities, there are limited healthcare infrastructures. For instance, there is often only one healthcare facility for all healthcare needs (Hemer, 2019; Keck, 2007). This resulted in a lack of privacy for young people needing confidential SRH services. Young people mentioned the lack of privacy at healthcare facilities has made them reluctant to access services offered (Keck, 2007; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; O'Connor et al., 2019; White et al., 2018a, 2018b).

For those young unmarried people who did access SRH services, the cost of travel and service fees were additional barriers (White et al., 2018a, 2018b). Many young adults in PICTs relied on their parents and families for financial support and could not afford fees. They recommended that services and commodities such as condoms and contraceptives be freely accessible as they were necessary for health and well-being (Kennedy et al., 2013, 2014).

Keep the premarital sexual activities hidden

Young, unmarried men and women in many PICTs kept their sexual relationships hidden from their parents, older relatives, and other members of their communities for fear of gossip, public shame, and embarrassment (Hemer, 2019; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; O'Connor et al., 2019; White et al., 2018a, 2018b). Young men and women have stated that when people in their communities have discovered or suspected that they have had sex, people (especially their friends and peers) tease and spread gossip about their sexual behaviours (Kennedy et al., 2014; Mitchell & Bell, 2020; O'Connor et al., 2019). Gossiping and teasing tarnish the reputation of young people in the community and reduce their chance of having a good married life (Mitchell & Bell, 2020; O'Connor et al., 2019). Young men and women were also afraid that exposure to their premarital sexual behaviours would disgrace themselves and their families (Keck, 2007; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; O'Connor et al., 2019; White et al., 2018a, 2018b). For these reasons, young unmarried people in the Pacific were not accessing SRH services because they did not want other people to know that they were sexually active (Kennedy et al., 2013, 2014; O'Connor et al., 2019; White et al., 2018a). To be seen at a family planning or a STI clinic is an indirect, non-verbal expression understood by the people in their communities to indicate that they have engaged in sex (White et al., 2018b).

Enablers of access to sexual and reproductive health services for young people

Increase sexual and reproductive health knowledge

To overcome the hurdles associated with opposition and disapproval for young people accessing SRH information and services, young men and women in PICTs reported that greater awareness was needed to increase parents' SRH knowledge (Kennedy et al., 2013). Parents' lack of sexual health education was a reason for poor parent-adolescent communication, opposition and disproval of accessing SRH services for counselling, commodities, and STI treatment (Kennedy et al., 2013, 2014; O'Connor et al., 2019). Workshops using drama that target parents, community elders, and leaders may increase sexual health knowledge in the communities (Kennedy et al., 2013, 2014; White et al., 2018a) In addition, some young unmarried people reported that some mothers are supportive (Mitchell & Bell, 2020; White et al., 2018a, 2018b); however, they need accurate sexual health information.

Many young men and women mentioned that lack of SRH knowledge and fear of not knowing what to ask for or discuss with healthcare providers was why they did not seek access to a SRH service when needed. To overcome this hurdle, young people have proposed ways to increase their own SRH knowledge. One way was for peer educators and nurses to visit schools and share sexual health information (Kennedy et al., 2014). Another way was for teachers to teach the sexuality education curriculum at primary and secondary schools (Kennedy et al., 2014). Young people describe nurses as the trusted source to deliver SRH information (Keck, 2007; Kennedy et al., 2013, 2014) because they are trained professionals who can provide advice and treatment (Kennedy et al., 2014). Other ways to increase SRH knowledge included posters, comics, pamphlets, and radio programs (Hemer, 2019; Keck, 2007). Young people reported they also obtained SRH information from Facebook (Kennedy et al., 2014).

Encouragement and support from parents and friends

Young men and women's personal barriers of fear, shame and embarrassment were reasons for not seeking access to a SRH services. However, encouragement, emotional and financial support from friends, parents and community members made it easier to seek and access SRH services (Kennedy et al., 2013; White et al., 2018a).

Friendly, non-judgmental, and kind healthcare providers

Young unmarried people described their preferred feature of a SRH service as that of a healthcare provider who is friendly, non-judgmental, and kind (Kennedy et al., 2013, 2014). A professionally trained person who understands young people's SRH rights and maintains patient confidentiality (Kennedy et al., 2013, 2014). In addition, a stand-alone SRH clinic is desirable (Kennedy et al., 2013, 2014).

2.6 Discussion

This scoping review sought a narrative of young unmarried people's challenges when seeking access to SRH information and services. Specifically, we wanted to know: 1) what has been reported about SRH of young people in PICTs; 2) what was reported on young people's perception and practices of accessing and using SRH services? To answer these questions, we conducted a systematic literature review of relevant databases, identified relevant studies, and examined young people's responses published in peer-reviewed articles.

Barriers to accessing SRH information and services among young people included a lack of SRH knowledge and social stigma associated with premarital sexual practices. Social stigma in the context of SRH is disapproval of or discrimination against individuals or groups based on social norms and affects the recipients of SRH services (Cook & Dickens, 2014). Findings showed that young person's fear, shame, and embarrassment were brought on by the judgmental attitudes of healthcare providers, parents, and members of their communities. Sexual and reproductive health information were not always communicated to young unmarried men and women in PICTs because of restrictive cultural communication practices. Thus, growing up, adolescents and youths had limited access to accurate SRH information within family units and had misconceived ideas of SRH services (Ram et al., 2020).

These findings are consistent with the Secretariat of the Pacific Community's report on barriers and enablers to SRH services in the Pacific region (Secretariat of the Pacific Community, 2015) and other studies conducted in the Pacific region and similar settings. For example, a study in Tonga shows that young people feared shame and embarrassment associated with possessing items such as condoms or being seen in venues such as family planning clinics (McMillan & Worth, 2011). In Kenya and Nigeria, young unmarried people also suffer the same burden of social stigma as recipients of SRH services (Mutea et al., 2020; Nmadu et al., 2020). Similarly, young people in Malaysia, Nepal, and Iran have expressed fear and shame as barriers to accessing SRH services (Othman et al., 2019; Regmi, Teijlingen et al. 2010; Shariati et al., 2014). Socio-cultural norms were considered deterrents to young people's access to contraceptives and STI treatments (McMillan & Worth, 2011; Munro, 2012).

Currently, young men and women in PICTs lack the resources to help them avoid unintended pregnancies and the acquisition of STIs. Evidence shows that this region's high rate of adolescent pregnancies and STIs stems from failures to address the young people's access to accurate information and quality healthcare services (Secretariat of the Pacific Community, 2015). In addition, youth-friendly services are still lacking in rural and remote communities and on outer islands in many PICTs (Clarke & Azzopardi, 2019; Secretariat of the Pacific Community, 2015; United Nations Population Fund, 2013). At the same time, healthcare providers' judgemental attitudes are rife toward providing emergency contraceptives and confidential counselling (Clarke & Azzopardi, 2019; United Nations Population Fund, 2013) to sexually experienced adolescents and young adults.

The International Conference on Population and Development, held in Cairo in 1994, recognised SRH rights as a cornerstone for population and development programs (United Nations Population Fund, 2014b). Despite this commitment, we found that young unmarried people's SRH rights for universal access to SRH service are not fully recognised in many PICTs (Dawson et al., 2021). Perhaps, insufficient and inadequate laws, policies, and guidelines may have contributed to discrimination and prevented access to SRH services (Secretariat of the Pacific Community, 2015). Our findings indicate the urgent need for tailored SRH services that young unmarried people may easily access (United Nations Population Fund, 2014a). A tailored sexual health service may assist in achieving the sustainable development goal 3.7; *Ensure universal access to SRH care services, including family planning, information, and education, by 2030* (United Nations, 2020). Some PICTs have developed SRH policies (Ministry of Health, n.d; National Department of Health, 2013). However, implementing these policies was problematic for various in-country reasons, such as the shortage of healthcare providers, lack of political will and resource constraints (Howes et al., 2014). The findings in this scoping review are crucial to informing some of these policies for better, more impactful implementation, such as supporting user-friendly healthcare services.

In PICTs, more research is required to understand the drivers of young adults' health-seeking behaviours, access to SRH information and services, types of SRH services accessed, and unmet need for services (Harrington et al., 2021). Evidence from this scoping review shows that there are limited data available on the health-seeking behaviours of young adults in PICTs, perhaps because of the sensitivities around socio-cultural expectation and premarital sexual behaviours (United Nations Population Fund, 2013; World Health Organization, 2018). In the present age of widespread use of information technology and mass movement of people away from their local Indigenous communities, further research into the SRH issues affecting young adults' quality of life must be carried out. For example, more research is required in Papua New Guinea to understand the drivers of risky sexual behaviours and the context in which unintended pregnancies occur among young people (Bell et al., 2018).

This scoping review has limitations. Firstly, we limited our search to those studies published in English, which may have limited numbers of articles retrieved from our search. Secondly, we searched only peer-reviewed articles and did not include grey literature, which may have precluded some data reported from young people in PICTs. Nevertheless, we sought to include the highest quality of evidence available to answer our review questions.

2.7 Conclusion

This scoping review found that social stigma and judgemental attitudes imposed by family and community members, including healthcare providers, hinder young unmarried individuals in PICTs from accessing SRH information and contraceptives. But on the other hand, a non-judgmental healthcare provider is perceived as an enabler in accessing SRH information and services**.** Therefore, changing policies for a tailored, user-friendly SRH service will help reduce adolescent pregnancies and STIs. In addition, only a few studies have focused on young people's SRH needs in the region. Therefore, more research is required to describe context-specific health-seeking behaviours of adolescents and youths in each PICTs to guide policy change and implementation.

Acknowledgement

The authors would like to thank Dr Karen Cheer for her support in reviewing the search strategy (review protocol) and the first draft of this article.

2.8 Chapter Summary

In this chapter, I presented the published scoping review. In the following chapter, I will present my philosophical stance and the research question that guided choice of methodology—an explanatory sequential mixed methods study design. I also include detailed information about the methods, including the steps taken for data collection and analysis, and the ethical approvals.

Chapter 3: Methodology and Methods

3.1 Introduction

To research the SRH knowledge, attitudes and practices of young people in PNG, I needed to implement a research methodology appropriate to the sociocultural context. I also needed a research methodology that best answered my research question. I explored the following philosophical positions for this study: postpositivism (the world exists apart from our understanding of it), constructivism (the world is created by our conceptions of it), transformative (emphasis on fairness and freedom from oppression) and pragmatism (beliefs more directly connected to actions) (Morgan, 2014). I concluded that pragmatism was the best fit because of its focus on the interaction between the nature of, and the methods of obtaining, knowledge (Creswell & Plano Clark, 2018). Therefore, I used pragmatism to inform my study design, analysis and interpretation.

I also adapted Saunders et al.'s (2019) research onion model to guide my implementation of the research methodology: explanatory sequential mixed methods and my descriptive and inferential statistical analysis of quantitative data and thematic analysis of qualitative data (Figure 3.1). Although Saunders et al. developed the research onion model to support research in a business discipline, researchers have applied it across a wide range of disciplines, including health research. As Figure 3.1 shows, the adapted research onion model has an outer layer of philosophy, an inner layer of approaches to theory development, followed by methodological choices and the innermost layer of techniques and procedures (Saunders et al., 2019). I explain the methodology of this study, starting with pragmatism as my philosophical stance. I then describe the rationale for using both deductive and inductive approaches, followed by an explanation of my choice to employ explanatory sequential mixed methods for data collection and analysis.

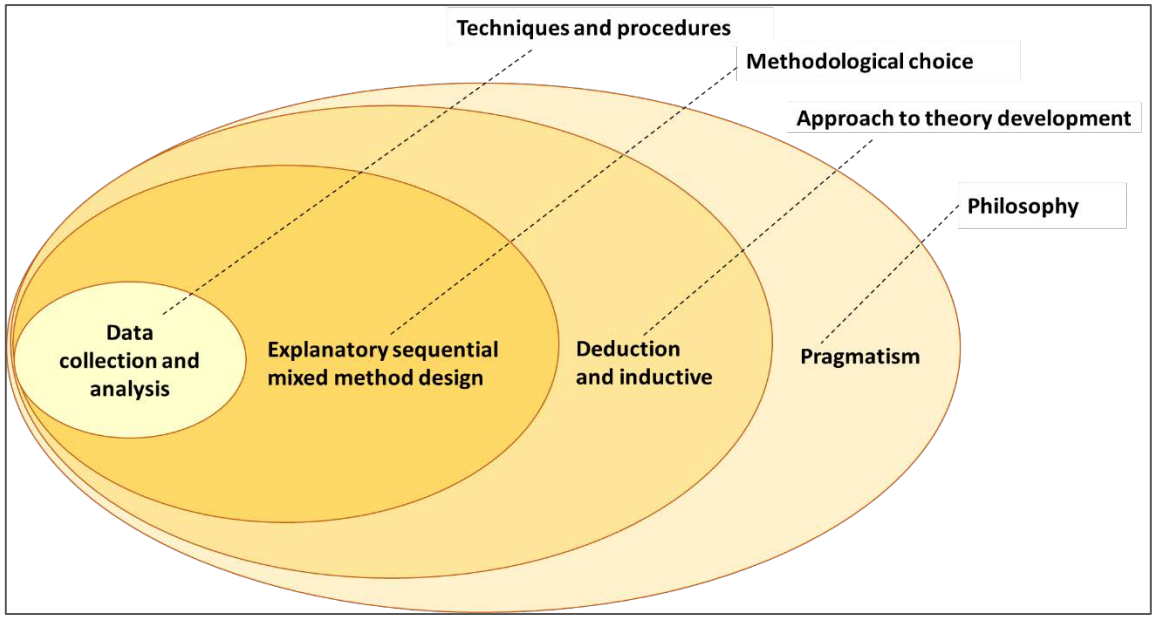

Figure 3.1: Research onion model showing the pragmatism philosophical stance (adapted from Saunders et al., 2019)

3.2 Pragmatism: My Philosophical Stance and Its Relationship to the Research Methodology

As shown in Figure 3.1, I began with my philosophical stance and reasons for adopting pragmatism. Pragmatism is a practical approach to problems and affairs; it is generally associated with mixed methods research, focuses on the research consequences, primarily the importance of the research question rather than on the methods, and allows the use of multiple data collection methods to inform the problems under study (Creswell & Plano Clark, 2018; Morgan, 2014)

The evolution of mixed methods research since the late 1980s has been influenced by ongoing debates about underpinning philosophical positions. First, the complexity of research problems calls for answers beyond simple numbers in a quantitative sense or words in a qualitative sense—beyond a positivist/postpositivist positioning. Combining both forms of data provides a complete analysis of complex problems with traditional different philosophical underpinnings about the ways that knowledge is created (Creswell & Plano Clark, 2018). For example, quantitative researchers situate numbers in the context and words of study participants, and they frame the words of participants with numbers, trends and statistical

results. Thus, these researchers recognised that qualitative (quantitative) data could play an important role in quantitative (qualitative) research. Moreover, audiences such as policymakers, practitioners and others in applied areas also needed multiple forms of evidence to document and inform research problems. When using the pragmatist approach, the important determinant in the research design and strategies is the research problem or question that a researcher tries to address (Saunders et al., 2019)

During the 1970s and 1980s, qualitative researchers were adamant about the differences in quantitative and qualitative research assumptions. They argued in the debate about research paradigms that mixed methods research was untenable because it requires researchers to combine different types of paradigms (Creswell & Plano Clark, 2018). Ultimately, Denzin and Lincoln (2005) and Mertens and Tarsilla (2015) advanced the idea that different types of methods could be associated with different philosophies. For example, *situationists* adapt their methods to the situation, and *pragmatists* believe multiple paradigms could be used to address research problems (Creswell & Plano Clark, 2018). Although the paradigm debate has continued, calls have been made to embrace pragmatism as the philosophical foundation for mixed methods research, honouring dominant research paradigms (postpositivism and constructivism). I sought to expand the sum of these paradigms by being explicit about when I used each while finding workable approaches to problem-solving for answering the research question (Morgan, 2014).

The SRH issues and subsequent problems of young people in PNG that are considered in this study are multifaceted and are influenced by the changing environmental circumstances. For example, the majority of young people in PNG are moving away from their local cultural settings, predominantly villages, to pursue higher education in larger urban cities, such as Port Moresby, Lae and Goroka. Therefore, by singularly applying a postpositivist or, in contrast, a constructivist worldview, I may not adequately understand the full extent of young people's challenges in accessing SRH services in PNG. The postpositivist objectively gathers high-quality quantitative data because of the rigour and thorough steps in data collection; however, this approach lacks the study participants' words, experiences and context and presents only a numerical description of the problem. Similarly, the constructivist subjectively gathers rich evidence, but these rich pieces of evidence may not be generalisable to a broader PNG population. Thus, the philosophical assumptions in pragmatism allow me the flexibility to

gather evidence objectively and subjectively in ways that work to address the multifaceted SRH challenges of young people in PNG (Creswell & Plano Clark, 2018).

The critical determinant in adopting the research design and strategies is the research problem or question that a researcher tries to address (Saunders et al., 2019). Next, I present the reasons for the different approaches I applied in data collection, analysis and interpretation.

3.3 Deductive and Inductive Approach

In the steps leading to evidence gathering, I began with a deductive approach and then applied an inductive approach using the explanatory sequential mixed methods study design (Creswell & Plano Clark, 2018; Saunders et al., 2019). This study design was culturally appropriate for collecting sensitive sexual health information from young university students in PNG. In PNG and other PICTs, namely, Fiji, Solomon Islands and Vanuatu, cultural communication practices together with church affiliation practices have restricted intergenerational dialogue about sex and sexual health education between an individual considered a young person and an adult (Kelly et al., 2010; Mitchell & Bell, 2020; Mitchell & Bennett, 2020b). Thus, it was culturally inappropriate for me, an adult insider Indigenous researcher, to directly interview or talk with a young person about sex without a platform (baseline) to start the conversation. Therefore, I began by inviting young university students to complete a self-administered structured questionnaire. Then, I used the results as the platform to open further discussions with the study participants through an anonymous story-based telephone interview.

Having described the approaches, next, I present the deductive and inductive data collection steps I took using the explanatory sequential mixed methods study design.

3.4 Explanatory Sequential Mixed Methods Study Design

The explanatory sequential mixed methods study design has two phases of data collection: an initial phase (Phase 1) and a follow-up phase (Phase 2; Creswell & Plano Clark, 2018). Phase 1 involves the collection of quantitative data, and Phase 2 involves the collection of qualitative data to explain and clarify the results on analysing the quantitative data. In this study, in addition, the Phase 1 participants were invited again to complete Phase 2. I collected the quantitative data through a quantitative cross-sectional survey. Then, I conducted anonymous story-based telephone interviews to collect qualitative data. Figure 3.2 shows the data collection steps I implemented.

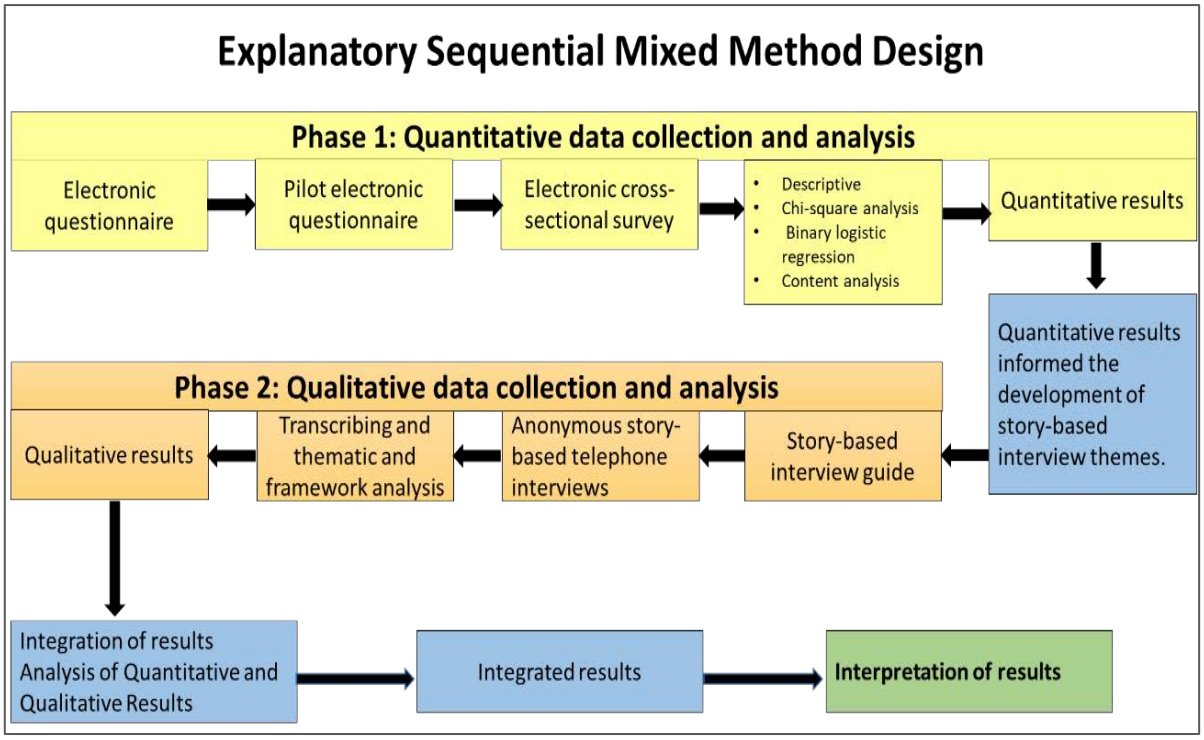

Figure 3.2: Explanatory sequential mixed methods study design (adapted from Creswell & Plano Clark, 2018)

Having summarised the explanatory sequential mixed methods study design, in the next section, I discuss Phase 1 in detail.

3.5 Phase 1: Quantitative Data Collection and Analysis

This section describes the questionnaire development process, the calculation of the minimal sample size, the participant recruitment process and the quantitative data analysis.

3.5.1 Data Collection Tool: Questionnaire

I adapted questions from the WHO's Illustrative Questionnaire for Interview-Survey with Young People, designed by Cleland (2001). The WHO developed this data collection tool as an instrument for investigators wishing to study young people's SRH. Researchers can adapt and modify questions to meet local circumstances and priorities and, wherever possible, use them in conjunction with qualitative methods of investigation (MacLaren et al., 2013). The Illustrative Questionnaire has questions designed to document SRH knowledge, beliefs, behaviours and outcomes and to assess the needs and problems of young people (see Figure 3.3; Cleland, 2001).

- Sources of information on sexual and reproductive health,
- Sexual and reproductive health knowledge,
- Sexual conduct, including the number and types of sexual partners and details of first sexual partnership,
- Sexual ideology/attitudes to gender,
- Protective, or risk, behaviours; condoms (knowledge, attitudes, use),
- Characteristics of current (most recent) boy/girlfriend,
- Sexual and reproductive health services (knowledge, use, evaluation),
- Sexual and reproductive health outcomes,
- Background characteristics.

Figure 3.3: Overlapping sexual and reproductive health themes taken from the Illustrative Questionnaire (Cleland, 2001)

From the content of the Illustrative Questionnaire (Cleland, 2001), I selected and modified questions based on my research objectives. I created a structured questionnaire with four sections (see Appendix 1): demography, SRH knowledge, sexual experience/conduct and access to SRH services. The questionnaire had 68 questions with single responses, multiple responses and free-text responses. The respondents did not answer all of the 68 questions because I included a skip logic to the questions that enabled respondents to answer only the questions that were relevant to them. For example, a respondent who had not engaged in sexual intercourse in their lifetime did not answer questions on their sexual conduct and experience.

3.5.2 Study Participants and Study Setting

The initial plan was to recruit young adults for this study from five tertiary institutions in Madang Town, PNG: Divine Word University, Madang Technical College, Marine Time College, Lutheran School of Nursing, and Madang Teachers College. There are two main reasons for choosing tertiary students as a sample of young adults in PNG.

First, tertiary students in PNG are well-known for their diligence and intelligence. Obtaining a tertiary education in PNG is challenging and involves navigating multiple examinations at various educational levels. For instance, I successfully passed four national exams to enter university. The first exam was taken at the end of grade 6 to qualify for secondary school. Following a secondary school curriculum change, I completed a second examination at the end of grade 8. After grade 10, I passed another exam to progress to grades 11 and 12, where

competition for placement is intense. Finally, I passed the grade 12 national examination, securing my place at a tertiary institution. Thus, an individual, especially a female student with a tertiary education qualification, is highly valued by her family and clan.

Secondly, I wanted to understand why an educated cohort of young adults in PNG could not access SRH information and services for their SRH with existing services in Madang Town. It is anticipated that tertiary students will have acquired some level of SRH knowledge, such as knowledge of HIV/AIDs and the importance of condom use through prior formal learning. Thus, the question is: Why were they not able to complete tertiary education because of unintended pregnancies and STIs despite the availability of SRH services in Madang Town?

With the COVID-19 restrictions that were in place during the period intended for data collection, the method of recruiting participants using probability sampling based on student registry as the sampling frame was changed to convenience sampling, and information was collected using an online survey instead of a paper-based survey. Also, I as the researcher, was not physically in PNG to collect data because of international travel restrictions. Hence, it was decided that the researcher must broaden the scope of the study and include all universities in PNG, then collect data using online surveys and telephone interviews from Australia. In hindsight, the change in the data collection method benefited the researcher because of the cultural and religious sensitivity in collecting personal SRH information from young adults using face-to-face approaches.

Only tertiary students who were born and raised in one of the twenty-two Provinces of PNG were included in the study. Papua New Guinean young adults who spent more than five years living outside of PNG and international students were not included in the study because their experiences with SRH information and services reflected those of other countries.

3.5.3 Sample Size

I used the Cochran formula for sample size calculation for the prevalence of an attribute present in a large population to calculate the sample size required to complete my survey (Buttner & Muller, 2012). This formula allows an estimation of 50% prevalence to be used for an attribute when the actual prevalence of the desired attribute is unknown (Buttner & Muller, 2012). In PNG, there are approximately thirty thousand university students. Data on their SRH knowledge, experiences and access to information and services are unavailable. Therefore, I estimated that 50% of all young university students in PNG would have had some knowledge

of SRH information and, at some point, had used the available SRH services. These students would have acquired SRH knowledge through natural sciences courses, such as high school biology and health sciences, as part of their formal education leading to tertiary education. With this reasoning, the prevalence of this attribute, SRH knowledge level among young university students, is 50%. The prevalence of the actual population was estimated using a 95% confidence interval and 10% precision.

The manual calculation steps are as follows:

1. ***n*** is the sample size.
2. **z** describes the statistical confidence, e.g. **z = 1.96** translates to a 95% confidence interval.
3. **p** is the expected hypothesised prevalence of 50% **(0.5)**.
4. **d** describes the intended precision when estimating the prevalence: **d = 0.1** means that the true prevalence will fall ±10% of the estimated prevalence from the sample (with the intended confidence).

$$n = z2 \times p\,(1 - p)/d2$$

$$n = 1.962 \times 0.5\,(1 - 0.5)/0.12$$

$$n = 3.8416 \times 0.5 \times 0.5/\ 0.01$$

$$n = 96$$

Therefore, the minimum sample size for an appropriate statistical power for the Phase 1 data collection was 96 participants.

3.5.4 Data Collection Protocols

My initial research plan was to recruit participants using probability sampling and distribute hard copies of the questionnaire to interested participants who attended five tertiary institutions in Madang Province. However, the COVID-19 pandemic and Australian border closure in March 2020 caused me to expand the scope of this study to include tertiary students attending universities in PNG instead of tertiary students in Madang Province and change the data

collection method to an online survey. I also changed the research questions and objectives to reflect the change in method.

I transferred the questions intended for a paper questionnaire into an electronic format using Qualtrics and then piloted the online survey from 20 to 21 January 2021. A total of 25 young people responded to the pilot survey questions. These 25 young people were current and past students I knew, and I was able to send them the survey link. The results were not included in this study. To express my gratitude and cover their potential out-of-pocket expenses, I gave each respondent an incentive of AU$10 phone credit, which was converted to Digicel phone credits in PNG. Then, I modified some lengthy, ambiguous questions that did not yield the expected responses and reorganised the skip logic enabling an appropriate response relevant to each respondent.

After modifying the online survey, I opened it on 18 February 2021, generated a new survey link and distributed the link to two of my research assistants in PNG, who assisted me in forwarding the link to potential participants using Facebook Messenger (social media). The data collection commenced on 19 February 2021 and ended on 4 March 2021. Respondents were invited to self-administer the questionnaire in order to remain anonymous while disclosing personal sexual experiences. Last, they were requested to nominate a Digicel phone number to receive an incentive of AU$10.00 equivalent to PGK30.00 phone credit.

3.5.5 Sampling Strategy

Respondents were recruited using convenience sampling. Convenience sampling is a non-probability sampling method that researchers use because it allows them to easily identify and access potential participants and collect information from them (Mukherjee, 2020). Researchers also find this sampling method convenient to use (Crosby & Salazar, 2020). Hence, it was a suitable method for this thesis in the context of the restrictions imposed following the COVID-19 pandemic. Participants were recruited using convenience sampling. Convenience sampling is a non-probability sampling used because of the ease of identifying, accessing and collecting information from potential participants (Mukherjee, 2020) and the researcher's convenience (Crosby & Salazar, 2020). As a result of the COVID-19 Pandemic and travel restrictions in 2020 I could not travel to PNG from Australia and invite participants to complete the survey using the traditional face-to-face approach. Instead, local colleagues in

PNG assisted me by identifying potential study participants and facilitating participants' self enrolment in the study.

I began the recruitment process by ensuring my two research assistants in PNG had a complete understanding of their roles in recruiting potential respondents. I provided them with the participant information summary (Appendix 2) and answered their questions until they were fully aware of their responsibilities as research assistants. Next, I shared the online survey link with them and sent them phone credits for internet data. I closely monitored their progress by regularly communicating with them over the phone on the days they began approaching potential respondents. Whenever my research assistants were unsure about approaching a potential respondent, I offered guidance and explained the process to them.

The potential respondents who verbally agreed to participate were given the online survey link. Then, the initial respondents forwarded the survey links to some of their friends. Thus, additional respondents were recruited through the snowballing method. Through this method, many respondents attempted the survey within 14 days, which forced me to close the survey link on 4 March 2021 because the number of respondents attempting the survey exceeded the number, I had intended to recruit based on my fixed budget for the telephone credit that I was providing each participant.

3.5.6 Data Analysis

After closing the survey in Qualtrics, I downloaded the responses and cleaned the data using Microsoft Excel to ensure all responses made sense. I thoroughly checked responses that appeared to be duplicated before deleting these and retained only one version. Following data cleaning, I developed a data dictionary using Microsoft Word and coded all responses. Then, I transferred the file with the cleaned and coded responses into Statistical Package for the Social Sciences (SPSS) software (version 28) for statistical analysis. I began data analysis using descriptive statistics and then moved to inferential statistics. Content analysis was used to sort and group similar open-ended responses under themes and then these open-ended responses were quantified to get frequencies (Drisko & Maschi, 2015).

First, I used three types of descriptive statistics—the measures of frequency, central tendency and dispersion—to provide simple summaries of the survey data (Daniel & Cross, 2019; Mishra et al., 2019). I used frequency statistics to count the number of times each categorical variable occurs, such as the number of male and female participants (see Section 4.5.1).

Next, I used the measures of central tendency and dispersion to summarise numerical variables (Mishra et al., 2019). To select the estimate of the measure of the central tendency—mean, median or mode—to use, I performed normality assumption tests on the numerical variables by considering the following four assumptions to determine whether the data are normally distributed:

1. The histograms should be symmetric around the mean (bell-shaped).
2. Q-Q plots should have points close to the line.
3. Skewness and Kurtosis values should be close to zero.
4. The Shapiro-Wilk test should be non-significant. In SPSS, the Shapiro-Wilk and Kolmogorov–Smirnov tests must have significant values greater than 0.05 to indicate normality (Denis, 2021).

All numerical variables that met all four normality assumptions were summarised using the mean as the measure of central tendency and the standard deviation as the measure of dispersion (Daniel & Cross, 2019; Triola et al., 2019). Numerical variables that did not meet the four normality assumptions were summarised using the median as the measure of central tendency and the interquartile range as the measure of dispersion (Buttner & Muller, 2012). For example, a numerical variable, participant age, did not fulfil all the four normality assumptions and was summarised using the median and the interquartile range (see Section 4.5.1).

For inferential statistics to determine the significant association between relevant variables, I conducted Pearson's chi-square tests (Laerd Statistics, 2017). I ensured that the relevant (nominal) variables I analysed met the following three assumptions for the chi-square test for association:

1. Both variables must be categorical.
2. The observations must be independent.
3. The expected counts of all cells must exceed five.

I also performed binominal logistic regression tests to predict the likelihood of relevant outcomes. For example, I analysed the likelihood of young university students visiting healthcare clinics to obtain contraceptives and information about contraceptives and STI treatments (Laerd Statistics, 2017). The expected behaviours were based on five independent variables, namely, gender, having had sex, residing in university dormitories, university year

level and region of origin. All five variables were chosen because of their perceived importance in relation to the outcome of interest. I took into consideration all four assumptions of running a logistic regression test:

1. The outcome variable must be measured on a binary scale.
2. There can be one or more predictor variables, which can be either continuous or categorical.
3. There should be independence of observations in the outcome variable. The dependent variable should have mutually exclusive and exhaustive categories.
4. There must be a linear relationship between any continuous predictor variables and the log transformation of the outcome variable.

3.6 First Integration of Quantitative and Qualitative Approaches

In the explanatory sequential mixed methods design, data analysis and integration occur more than once (Creswell & Plano Clark, 2018). In the first integration to bring together quantitative and qualitative approaches, quantitative results are used to inform the steps needed in the qualitative approach. In my first integration, I wrote a short story (see Figure 3.4) based on the quantitative results and then used the short story as the interview guide to obtain further explanations and clarifications of the survey results from the study participants.

Short story shared with male participants: Duncan is a 22-year-old young man who attends [name removed] University as a third-year student. Duncan's father is from East Sepik Province, and his mother is from Simbu Province. Duncan's family are Christians and belong to the Seventh-Day Adventist Church. Duncan grew up in Lae as both of his parents were working and living in Lae. Duncan's family has regularly visited his father's and mother's villages in Sepik and Simbu. While attending [name removed] University, Duncan resides with other male students in a dormitory. Duncan has secretly dated Dulcie for the past six months. Dulcie is also a third-year student. Both Duncan and his girlfriend Dulcie have had sex on several occasions.

Short story shared with female participants: Dulcie is a 22-year-old young woman who attends [name removed] University as a third-year student. Dulcie's father is from East Sepik Province, and her mother is from East New Britain and Milne Bay Provinces. Dulcie's family are Christians and belong to the Roman Catholic Church. Dulcie grew up in Port Moresby as both of her parents were working and living in Port Moresby. Dulcie's family has regularly visited her father's and mother's villages in Sepik and Rabaul. While attending [name removed] University, Dulcie resides with other female students in a dormitory. Dulcie has secretly dated Duncan for the past six months. Duncan is also a third-year student. Both Dulcie and her boyfriend Duncan have had sex on several

Figure 3.4: Short stories used in *tok stori* (storytelling) to interview male and female participants

In the Melanesian context, stories are shared to transfer knowledge (oral history) or to facilitate the release of embedded information through conversation (Evans et al., 2010). In this study, I drew on the principles of Melanesian *tok stori* (storytelling) research to set the stage for gathering qualitative data. Melanesian *tok stori* research is a context-specific tool that can be applied for studying various aspects of Melanesian *wantoks* (Melanesian people) in their natural settings (Sanga & Reynolds, 2023). I also drew on the argument that reliance on the evidence gathered through the scientific approach guided by positivism does not always bring out the best outcome for an Indigenous population that is expected to the beneficiary (Mafile'o et al., 2022). Mafile'o et al. (2022) presented the power of story as a process of transformation towards the decolonisation of theory and practice. The authors i.e. (Mafile'o et al, 2022) asserted that as people reflect on and share examples of change, they 'talk up' and challenge the rationalist, evidence-based approach in their respective professional spaces.

I decided to use the *tok stori* technique to collect qualitative data for this study. This approach also included the same considerations as given to the survey respondents who self-administered the questionnaire. I wanted participants to remain anonymous and comfortable and not feel like I was asking them direct questions about their own responses to interview questions. Furthermore, young adults in this study were also familiar with the *tok stori* or *yumi tok stori* ('you and I tell stories') technique (Bolinga, 2023). I centralised the data-driven stories in my next round of interactions with the participants.

3.7 Phase 2: Qualitative Data Collection and Analysis

In this section, I describe the data collection tool, study participants, participant recruitment process, interview data collection and data analysis.

3.7.1 Data Collection Tool

The interview guide I used was informed by the quantitative results. I created two fictional characters named Duncan and Dulcie and wrote two gender-specific interview guides (see Figure 3.4)—one each for the male and female participants. Figure 3.5 presents the interview guide I used for female participants. This guide has three major themes: support for sexual health, access to SRH services, and knowledge about STIs and contraceptives.

Introduction
Thank you for agreeing to participate in this interview and completing the online survey in February 2021. I am interviewing you to better understand the responses you made to the online survey you recently completed. For your information, data in the survey were analysed, and some results are as follows: 228 students from across the six universities in Papua New Guinea completed the questionnaire. All respondents were young adults, aged 23 years on average. The majority of the respondents were Year 3 students, while the least were Year 1 students. Most respondents were residential students living in university dormitories (69%, n = 157). At the time of the survey, most respondents self-identified as still single (89%, n = 202), followed by fewer engaged and married.

This interview focuses on young people and sexual health; therefore, there are no right or wrong answers to any questions I will ask you. I am only interested in your explanations, views and opinions. Please note! Participating in this interview is voluntary, and your decision to participate or not to participate will not affect your usual daily way of life. This interview will take approximately one hour, depending on how much information you want to share. Do you have any questions about what I have explained? I want to audio record this interview with your permission because I do not want to miss your comments. Is this OK with you? Thank you. May I turn on the digital recorder? Thank you.

Establishing rapport
Before we begin, it would help if you could tell me a bit about yourself; for example: Where are you from? If you have mixed parentage, what Province do you feel most connected to? What do you plan to do after graduating from university? Our discussion today will be based on a short story I will share with you. As the lead researcher for this study, I wrote this short story informed by the responses made by young men who participated in the survey. I kindly ask that you listen as I read it, and we can then discuss it.

Narrative (Storytelling)

Dulcie is a 22-year-old young woman who attends [name removed] University as a third-year student. Dulcie's father is from East Sepik Province, and her mother is from East New Britain and Milne Bay Provinces. Dulcie's family are Christians and belong to the Roman Catholic Church. Dulcie grew up in Port Moresby, where both her parents worked and lived. Dulcie's family has regularly visited her father's and mother's villages in Sepik and Rabaul. While attending [name removed] University, Dulcie resides with other female students in a dormitory. Dulcie has secretly dated Duncan for the past six months. Duncan is also a third-year student. Both Dulcie and her boyfriend Duncan have had sex on several occasions.

This is the end of the short story that summarises responses from the survey data. I want to ask you a few questions about your response to this story.

First, I would like to ask about support for young people's sexual health.
In your opinion, should young women like Dulcie use contraceptives? Why? What types of contraceptives should they use? Where would they get them? Why? Prompts: Who else could get contraceptives if Dulcie is not able to? Where would young people like Dulcie and Duncan get sexual health support? Prompts: What roles do fellow students, friends and peers play in providing sexual health support? What roles does university student service play in providing sexual health support? What roles do family members like sisters, aunties, mothers, brothers and fathers play in providing sexual health support?

Second, I am wondering about access to sexual and reproductive health services for female students. Dulcie is now pregnant. Can you share an experience of seeing someone like Dulcie becoming pregnant? Why? Prompts: Would girls who share the dormitories help someone like Dulcie? Why? Prompts: Are there any cases of abortion among young women living in university dormitories? Why? Were young women able to seek proper clinical care? Why?

Dulcie has been sick with a high fever and abdominal pain. She also experienced pain when passing urine and saw abnormal yellowish discharge coming from her vagina. What do you think is happening here? Why? Prompts: What should Dulcie do about these symptoms? Why? Prompts: Where would she go to get help? Why?

Finally, my last question. If you were in a position to make a change, what would you like to do to change Dulcie and Duncan's story? Prompts: What would you do to enable young men and women to have good and healthy sexual and reproductive health? Why?

Thank you very much for your time and the information you shared today. All your responses will be kept confidential and will be used only for this research. As a token of appreciation, I will send you a PGK20.00 phone credit to your phone number.

Figure 3.5: Guide for interviews with female participants

3.7.2 Study Participants

The participants in this follow-up (second) phase of data collection were the same individuals who attempted the online survey (first phase of data collection).

3.7.3 Participant Recruitment

I used purposive sampling to recruit survey participants for the second round of data collection. During the online survey, I asked participants (for whom I had no identity data) to nominate a phone number (preferably a Digicel phone number) so that I could send them telephone credit to thank them for their time and their use of internet data in completing the online survey. From the list of nominated phone numbers, I selected 10 and sent a short text message inviting survey respondents to take part in the follow-up phase of data collection. I also sent a Digicel phone credit of AU$0.80 equivalent to PGK2.00 so that the survey respondents could reply to inform me of their interest in being involved in the study again.

To those who expressed interest in participating in the study and replied ‘Yes (I am interested in being involved again in the study)’ to my initial message, I sent a second message offering to call them so I could explain the invitation. I called those who agreed to a phone call and provided them with more information about the study before verbally inviting them to participate. Once they agreed, we scheduled a date and time that worked for them. I also sent them an information message about the study and a consent form to be read before the interview. To proceed with the telephone interview, they had to reply ‘I consent to be interviewed’ as a text message to my phone number. One female participant also provided me with the phone numbers of her friends who had completed the online survey, so that I could invite them to participate in the follow-up phase of the study.

3.7.4 Interview Data Collection

I tested the telephone interview process with the male research assistant in PNG and made some changes. The first change was to shorten the invitation message I planned to send to potential participants. My initial invitation message had more than 115 words, which automatically became a multimedia message instead of a text message (short message service) when sent from my Samsung smartphone in Australia. The male research assistant in PNG informed me that he received the invitation message as a link and was concerned that some potential participants might be unable to open and read it. I revised the message and reduced

the word count to less than 115 words, which meant the message became a text message instead of a media message.

I am glad that I made this change before inviting participants. Had I not reduced the word count, I would not have been able to conduct the telephone interviews in a short amount of time. Potential participants may not have been able to open the link and would not have responded to my invitation message, leaving me unsure about what had gone wrong.

After making the necessary changes, I conducted telephone interviews with six female participants and the male research assistant conducted telephone interviews with six male participants from 5–29 April 2022. Interviews were conducted in predominantly in the English language, but some were conducted in Tok Pisin (a PNG lingua franca) as desired by the participants. I am fluent in both languages. Appendix 4 outlines the detailed steps taken for the participant recruitment and the telephone interview. Appendix 5 is the male interview guide.

3.7.5 Interview Data Analysis

I analysed the qualitative data using a mixture of Braun and Clarke's (2006) thematic analysis approach and Goldsmith's (2021) framework analysis approach, all guided by Creswell and Plano Clark's (2018) principles for designing and conducting mixed methods research.

To begin, I familiarised myself with the data by engaging in interviews with the female participants. I also transcribed verbatim all the audio recordings for the interviews with the 12 participants and took detailed notes on the meaning of every expression. I analysed the expressions used in Tok Pisin and translated them into English for each audio recording. I also accomplished data familiarisation by adopting Goldsmith's (2021) approach to data familiarisation of adding handwritten notes in the margins of the printed transcripts. My handwritten notes were guided by the research questions and objectives.

Next, I transferred the interview transcripts into NVivo (version 12) software and generated initial codes by adopting Braun and Clarke's (2006) approach to generate initial codes. During this process, I wrote my notes as a memo to draw meaning from the participant responses. As a novice researcher, I found the NVivo software useful for organising my codes simultaneously and linking my ideas with the data, which enabled me to avoid deviating from a participant's voice.

Then, I adopted Goldsmith's (2021) framework analysis approach and created abstract concepts using the notes and initial codes in NVivo. Next, I indexed the data using two units of analysis (male and female participants). I exported the codes from NVivo to a Word document, and for each of my initial codes, I created a table with five columns in which expanded the codes from concrete descriptions of the themes (initial codes) to abstract concepts. The first column has the initial code (e.g. the use of contraceptives), the second column has my abstract concept as a revised framework, the third column my notes as researcher's notes, and the fourth and fourth columns had participant statements as female and male participants. To show this process, in Appendix 5 I have included one of the framework identifications and indexing I performed from the initial code, '*use of contraceptives*'. Goldsmith's framework identification and indexing after data familiarisation is similar to Braun and Clarke's (2006) Phase 3, namely, searching for themes in thematic analysis, and the two methods are highly complementary.

While analysing the interview data, I drew from Goldsmith's (2021) framework identification approach, which involves analysing concrete descriptions of the themes (codes) in the data to identify the more abstract concepts and provide a framework or structure for interpreting findings. As a novice mixed methods researcher, I opted for framework analysis to analyse the qualitative data because it operates from a pragmatic epistemology and can be applied to various data for various reasons (Goldsmith, 2021). In addition, by using framework analysis, I was able to provide targeted answers about my study population. For example, male explanations and views about contraceptives and female views were combined and described with views strongly emphasised by both sexes clearly evident.

Last, I applied thematic analysis (Braun & Clarke, 2006, 2022) for data charting and created a story of barriers to, and enablers of, young people's access to timely, quality SRH services to maintain good SRH.

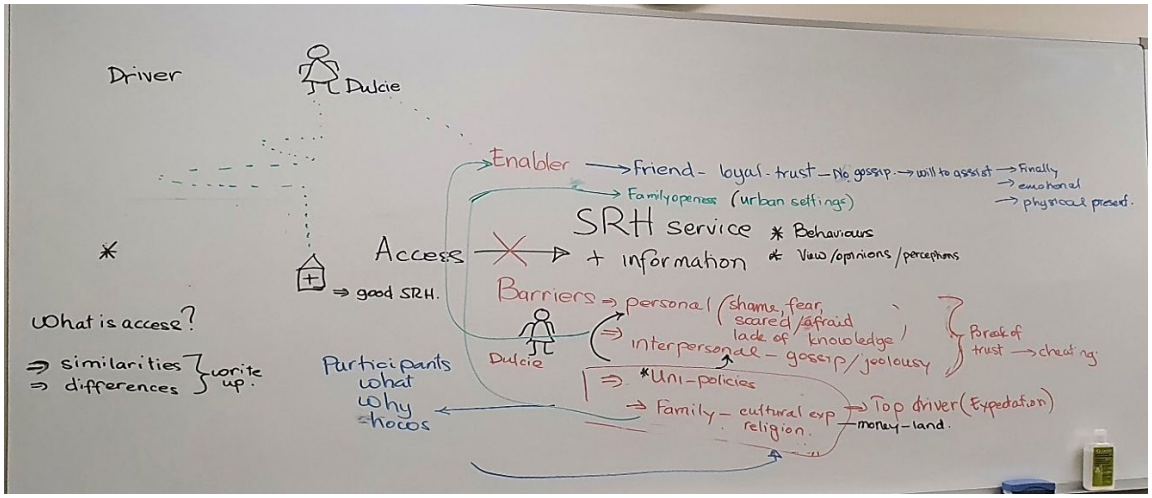

Figure 3.6: Data charting and interpretation by the researcher

3.8 Second Integration

The second integration is a third form of data analysis in this study design, where the quantitative results and qualitative findings are analysed together to produce an integrated result (Creswell & Plano Clark, 2018). I used the quantitative results as the base and linked them with the narratives in the qualitative data. The narratives in the qualitative data explained the numerical data, thus an integrated result.

3.9 Data Management

The research data (Word and Excel files and audio recordings) are stored electronically. I have carefully labelled each item and secured it in password-protected folders on my laptop. Data are kept in secure folders on password-protected drivers at James Cook University (JCU).

The quantitative data consist of survey responses, which I downloaded and stored copies as SPSS, Excel and Word files. The qualitative data comprised audio recordings, consent forms and transcripts. To maintain confidentiality, study participants were instructed to use pseudonyms during interviews, which eliminated the need for de-identification. All interviews were conducted using mobile phones and recorded on laptops that were password-protected. Once the male research assistant completed interviews with male participants, he emailed me audio recordings via my JCU student email. After I received these, I requested him to delete all recordings from his own password-protected laptop.

Given the sensitive nature of this sexual health research, I have not uploaded cleaned or raw data on the JCU research data management site. However, I have provided full copies of the

survey and interview data I collected during the study to my primary advisor and have thus completed the data management.

3.10 Ethics Approval

There were three ethics committees that I gained approval from to conduct this research. First, I gained approval from the PNG Medical Research Advisory Committee (MRAC), which is the governing body for human ethics and clinical research in PNG. The MRAC approved my study on 23 October 2020 (reference number: MRAC 20:23; see Appendix 6). Since my research setting was in PNG, it was essential to obtain this approval first.

Subsequently, I submitted the approved protocol and all supporting documents to the JCU Human Ethics Committee for reciprocal approval. On 14 January 2021, my study protocol was granted reciprocal approval by the JCU Human Ethics Committee (reference number: H8319; see Appendix 7). Last, the DWU Research Ethics Committee in PNG granted approval (reference number: REC-01/2021), which allowed me to include their students in this study (Appendix 8). The DWU required ethics consideration for the involvement of its students.

3.11 Chapter Summary

In this chapter, I described the philosophical stance that influenced my choice of methodology and explained the reasons for selecting the explanatory sequential mixed methods designs. I outlined the data collection and analysis methods and the stages of data collection and interpretation for this study.

In the following two chapters, I present the findings according to this study's objectives.

Chapter 4: Sexual and Reproductive Health Knowledge and Practices of Papua New Guinean University Students

4.1 Chapter Overview

This chapter presents the results that meet Objectives 1 and 2 of this thesis:

1. Describe the SRH knowledge and practices of university students.
2. Explore and explain the individual, social and cultural factors that influence the SRH of university students.

The chapter is presented as a manuscript to be submitted for publication in *PLOS Global Public Health*. This chapter focuses on identifying young people's SRH knowledge and their sexual experiences and activities and, to this end, reports integrated quantitative and qualitative results. The quantitative results include a comparison of the proportion of the SRH knowledge of males with that of females and the effects of the associations between gender and the predictor variables on the likelihood of young people in PNG engaging in sex. The qualitative results provide reasons, views and opinions that expand understanding of the quantitative results.

RESEARCH ARTICLE

Sexual and reproductive health knowledge and practices of young university students in Papua New Guinea: An explanatory sequential mixed methods study

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4.2 Abstract

Background: Papua New Guinea (PNG) has the highest burden of cervical cancer globally and the highest prevalence of sexually transmitted infections in the Pacific region. Further, a

lack of contraceptive information has forced young unmarried women to terminate unplanned pregnancies using unsafe means and thus risk sepsis and death. Although schools provide sexual health education, conservative Christian teachings, schools' limited resources and poor-quality teacher education compromise the quality of such teaching. Moreover, studies on young people in PNG do not describe university students' sexual and reproductive health (SRH) knowledge and sexual activities. Therefore, this study describes the SRH knowledge and the sexual activities of young adults attaining university education in PNG.

Methods: This study was conducted using an explanatory sequential mixed methods design. Quantitative data were collected through an electronic cross-sectional survey. The convenience sampling technique was used to recruit survey participants. Numerical data were analysed using the Statistical Package for the Social Sciences (version 28) software, and open-ended responses were analysed using content analysis. The survey results then informed the collection of qualitative data. After the quantitative data collection and analysis, qualitative data were collected using a story-based interview. The short story used was written by considering the demographic characteristics of the survey participants and the key quantitative findings. Then, this story was shared during an anonymous telephone interview with purposively selected participants who had completed the cross-sectional survey. Qualitative data were transcribed and analysed using thematic and framework analysis. The integration of quantitative results and qualitative findings answered this study's research question.

Results: In all, 228 students from six PNG universities completed the survey phase of the study. Among them, 12 also took part in the telephone interview. The median age of the study participants was 23 years. The majority were still single during the online survey, and 66% had engaged in sexual intercourse. Most participants had a general understanding of contraceptives and where to obtain these; however, they lacked knowledge on how to use these contraceptive methods for their SRH needs. More than 85% did not use condoms regularly, and unintended pregnancies were reported as a regular occurrence every year. Embarrassment and a lack of contraceptive knowledge were the main reasons for low condom use.

Conclusion: Almost all young university students are in sexual relationships. A significant number of young university students have a clear understanding of STIs. Similarly, many students generally understand the purpose of contraception and know where to access these contraceptives. However, there is a limited understanding of the menstrual cycle and the correct

use of emergency contraceptive pills to prevent unintended pregnancies. This highlights the need for age appropriate SRH awareness and resources in these areas.

4.3 Introduction

Young adults (aged between 18 and 25 years) in resources-poor settings face tremendous challenges in meeting their sexual and reproductive health (SRH) needs. For instance, many lack access to accurate information and quality services to avoid adverse SRH consequences. A scoping review of young people living with human immunodeficiency virus (HIV) infection in low- and middle-income countries found that the number of young people with behaviours-acquired HIV has increased over time (Mkumba et al., 2021). In 2022, close to half a million young individuals between the ages of 10 and 24 were diagnosed with HIV, with a staggering 140,000 of them being adolescents between 10 and 19 (UNICEF, 2023). In Papua New Guinea (PNG), the lack of age appropriate contraceptive information and services to delay and avoid unintended pregnancies has forced young women to resort to unsafe abortions, which puts them at risk of sepsis and death (L. M. Vallely et al., 2015). Furthermore, a biobehavioural survey of sexually transmitted infections (STIs) among pregnant women attending antenatal clinics reported a high prevalence of curable genital STIs among young women aged less than 25 years (L. M. Vallely et al., 2016, 2017; Wangnapi et al., 2015). Curable STIs (i.e. chlamydia, gonorrhoea, syphilis and trichomoniasis) are among the many contributing factors to the poor maternal and neonatal health outcomes in PNG (L. M. Vallely et al., 2016). Without accurate SRH information, young people in PNG are vulnerable to sexual coercion, unintended pregnancies, unsafe abortion and STI acquisition.

The SRH indicators in PNG are among the worst locally and globally. For example, during 2010- 2023, PNG had a higher HIV prevalence, including other STIs in the Pacific region, compared to other PICTs (HIV/AIDS Data Hub for the Asia-Pacific Region, 2023; Vallely et al., 2010). It also has the highest estimated burden of cervical cancer globally: the deaths in PNG due to this disease are estimated to be 1,000–1,500 per year, which is 10 times higher than that in Australia and New Zealand (Kelly-Hanku et al., 2019; A. Vallely et al., 2011). Furthermore, the adolescent birth rate remains high at 13%, with 22% of 19-year-old women having at least one child and 6% having two or more children (United Nations Population Fund, 2020). The contraceptive prevalence rate remains low, with high unmet contraceptive needs, especially among sexually active unmarried women (National Statistical Office, 2019). Given

the deteriorating and poor healthcare infrastructure and geographical challenges, PNG's maternal mortality and morbidity rates are among the highest globally (Dennis, 2018)

A cohort of young people at risk of adverse SRH consequences are students enrolled for tertiary education courses in PNG. Many of them are young adults aged between 18 and 25 years. Unlike those younger than them, these young adults are no longer under parental supervision. Instead, they are beginning to assume individual responsibilities including engaging in sexual experimentation (Society for Adolescent Health and Medicine, 2017). Hence, for those in this cohort, a higher rate of premarital sexual activities, unintended pregnancies and unsafe abortion are reported, for example, for young university students (Ehrsson et al., 2016; Gray et al., 2019; Guan, 2021; Somba et al., 2014). Thus, purposeful prevention and intervention strategies targeting this period of adulthood may alter trajectories and decrease SRH threats along the adult life course (Society for Adolescent Health and Medicine, 2017).

Moreover, in PNG, not much is known about university students' level of SRH knowledge and sexual practices. Although schools impart sexual health education through subjects such as personal development, this education is severely limited by poor-quality teacher education, conservative Christian teachings and limited resources (Kelly-Hanku et al., 2019). Therefore, this study describes the SRH knowledge, sexual experience and activities of young university (tertiary) students in this country.

4.4 Methods

This study was conducted using an explanatory sequential mixed methods design. Quantitative data were collected through an online cross-sectional survey. The survey questions were adapted and modified from the World Health Organization's (WHO) validated questionnaire for SRH (Cleland, 2001). The cross-sectional survey was administered using Qualtrics XM software through which a survey link was generated and sent as a telephone text invitation message to young university students in PNG. Participants were identified using the convenience sampling technique, and those who consented to participate were sent the survey link allowing self-recruitment into the study. Only participants who consented to participate in the electronic survey were able to attempt the self-administered questionnaire. The survey data were analysed using the Statistical Package for the Social Sciences software (version 28), beginning with descriptive statistics, followed by inferential statistics using Pearson's chi-square tests for associations and binominal logistical regression for predictions. Open-ended

survey responses were analysed using content analysis (Hsieh & Shannon, 2005). Last, the results from the quantitative data informed the development of a story-based interview guide.

Qualitative data were collected through anonymous telephone interviews using a storytelling approach (Sanga & Reynolds, 2023). Interview participants were purposely selected. Telephone text invitation messages were sent to participants who had completed the electronic cross-sectional survey, asking them whether they were interested in explaining and clarifying their survey responses further. Only participants who confirmed they had completed the online survey and consented to be interviewed could participate in Phase 2 of the study. Audio recordings of the interview were transcribed verbatim. Expressions made in a PNG lingua franca (Tok Pisin) were analysed and then translated into English. Qualitative data were analysed in NVivo (version 12) using Braun and Clarke's (2022) thematic analysis approach and Goldsmith's (2021) framework analysis approach in order to understand and visualise participants' narratives. Last, the quantitative and qualitative findings were integrated to answer this study's research question.

Ethics approvals were granted by the PNG Medical Research Advisory Committee (MRAC.20.23), James Cook University's Human Ethics Committee (H8319) and Divine Word University's Research Ethics Committee (REC-01/2021).

4.5 Results

4.5.1 Demographic Characteristics of Participants

In all, 228 students (97 males, 131 females) across six universities in PNG completed the online survey (Table 4.1). Of the 228 participants, 12 (six males and six females) were recruited again to participate in the telephone interviews. The ages of these participants ranged from 19 to 32 years. All participants were undergraduate students; the majority were in Year 3 (37%, *n* = 88), whereas the least were in Year 1 (11%, *n* = 25). Most participants (70%, *n* = 157) lived on a university campus.

Table 4.1: Participant demographics

Sociodemographic characteristics	Male		Female		Total	
	n	%	*n*	%	*n*	%
Survey respondents	97	42	131	58	228	100

Age	Median (years)	23		22		23	
	IQR (years)	21–24		21–24		21–32	
Relationship status	Single	91	45	111	55	202	89
	Married	6	23	20	77	26	11
Having had sex	Yes	73	48	78	52	151	66
	No	53	69	24	31	77	34
Religion	Catholic	26	42	36	58	62	27
	Anglican	1	25	3	75	4	2
	United Church	7	64	4	36	11	5
	Seventh-Day Adventist	17	32	36	68	53	23
	Revival	5	56	4	44	9	4
	Pentecostal	18	40	27	60	45	19
	Lutheran	14	56	11	44	25	11
	Baptist	5	61	8	39	13	6
	Don’t attend church	4	67	2	33	6	3
Reside on campus	Yes	71	45	86	55	157	70
	No	24	35	44	65	68	30
University year level	Year 1	12	48	13	52	25	11
	Year 2	29	56	23	44	52	23
	Year 3	35	42	48	58	83	37
	Year 4	20	30	46	70	66	29
Lived outside PNG	Yes	1	17	5	83	6	3
	No	96	42	126	58	222	97
Clinic on campus	Yes	95	42	131	58	226	99
	No	2	100	0	0	2	1

At the time of the survey, more than 80% of the participants self-identified as still single and belonging to one of the many Christian denominations in PNG. Furthermore, most participants originated from only one province in PNG (67%, *n* = 152), whereas others identified as having more than one province of origin (Table 4.2). Almost all participants (97%, *n* = 222) had lived only in PNG (Table 4.1).

Table 4.2: Province of origin

Province of origin: Number	%	*n* = 228
One	67	152
Two	24	54
Three	7	17
Four	2	5

4.5.2 Sexual and Reproductive Health Knowledge

Nearly all survey participants (99%; *n* = 226) were able to name some of the signs and symptoms of STIs in a male, such as a sore on genitalia (78%), pain when urinating (71%) and abnormal discharge from the penis (70%). Similarly, they correctly identified signs and symptoms of STIs in a female, such as vaginal discharge (80%) and pain when urinating (71%). This level of STI knowledge was further explored during the in-depth telephone interviews. During the interviews, participants were asked what might be happening to the male and female characters (in the story-based interview guide; see Chapter 3, section 3.71), who were described as experiencing high fever with abdominal pain and yellowish discharge from their genitalia. All 12 interviewees answered that the symptoms of the male character (Duncan) and female character (Dulcie) indicated that both had contracted some type of STI; for instance:

> I think Duncan is infected with an STD [sexually transmitted disease]. (Male 6)

Similarly, a female university student answered:

> I don't know the exact name. Still, I think it is a sexually transmitted infection because of her sexual activities. (Female 3)

Another female participant answered:

> I think she has a urinary tract infection because of the pain, fever, discharge and frequent urinating. Urinary tract infection is caused by bacteria and transmitted by sexual intercourse. (Female 5)

Table 4.3 presents the summary of the participants' SRH knowledge. Beginning with reproductive knowledge, 71% (*n* =163) knew that a woman would likely become pregnant if she had sex.

Table 4.3: Sexual and reproductive health knowledge

Question	Answer	Female		Male		Total		
		n	*%*	*n*	*%*	*n*	*%*	*p*-value
Can a woman become pregnant the first time she has sex?	Yes	93	57	70	43	163	71	0.694
	No	25	63	15	37	40	18	
	Don't know	13	52	12	48	25	11	
Have you heard about the safe and unsafe days of a menstrual cycle?	Yes	127	63	75	37	202	88	**0.001**
	No	1	17	12	83	13	6	
	Don't know	3	23	10	77	13	6	
Can a woman become pregnant if she has sex midway through her menstrual cycle?	Yes	63	55	51	45	114	50	0.799
	No	34	60	23	40	57	25	
	Don't know	34	60	23	40	57	25	
Have you heard about contraceptive methods?	Yes	125	58	92	42	217	95	0.841
	No	6	55	5	45	11	5	
Do women need to take contraceptive pills every day?	Yes	63	65	34	35	97	45	**0.034**
	No	27	44	34	56	61	28	
	Don't know	36	60	24	40	60	27	
Do you know where to obtain contraceptive pills	Yes	59	70	25	30	84	87	**0.021**
	No	4	31	9	69	13	13	
When can a woman take emergency contraceptive pills to avoid pregnancy?	Soon after having sex	62	63	36	37	98	45	0.096
	One week after having sex	7	37	12	63	19	9	
	Don't know	56	66	43	34	99	46	
Do you know a place to obtain emergency contraceptive pills?	Yes	59	63	35	37	94	79	0.090
	No	11	44	14	56	25	21	
Are condoms effective in preventing pregnancies?	Yes	68	55	55	45	123	56	0.667
	No	44	60	29	40	73	34	
	Don't know	14	64	8	36	22	10	

Do you know where to obtain condoms	Yes	64	55	53	45	117	95	0.565
	No	4	67	2	33	6	5	
Are condoms effective in preventing STIs, including HIV?	Yes	62	62	38	38	100	44	**0.010**
	No	50	48	54	52	104	46	
	Don't know	19	79	5	21	24	10	

Almost 90% had heard about the safe and unsafe days in a menstrual cycle, and 50% knew that a woman is likely to become pregnant if she has unprotected sex midway through her menstrual cycle. There was a significant association between gender and knowledge of safe and unsafe days in a menstrual cycle. Significantly, more females (63%, $n = 127$) than males (37%, $n = 75$) were aware of the safe and unsafe days in a menstrual cycle ($\chi^2(1) = 21.25$, $p = 0.001$).

In all, 95% of the survey participants ($n = 217$) had heard about modern contraceptive methods. Therefore, when asked whether women must take contraceptive pills daily to avoid pregnancies, 45% ($n= 97$) answered correctly, and 87% ($n = 84$) knew where to obtain the pills. In addition, there was a statistically significant association between gender and knowledge of where to obtain contraceptive pills. More females (70%, $n = 59$) than males (30%, $n = 25$) knew where to obtain contraceptive pills ($\chi^2(2) = 7.72$, $p = 0.021$).

Only 45% of the survey participants ($n = 98$) responded correctly that a woman has to take emergency contraceptive pills soon after having unprotected sex in order to avoid conception and pregnancy. Thus, almost 80% knew where to obtain emergency contraceptive pills. However, there was no significant association between gender and the knowledge of when to take emergency contraceptive pills (Table 4.3).

Furthermore, 56% ($n = 123$) of the participants knew condoms could prevent pregnancies, and 44% ($n = 100$) believed condoms prevented the transmission of some STIs, including HIV. Almost all participants (95%, $n = 117$) knew where to obtain supplies of condoms (Table 4.3). Figure 4.1 shows condoms as the most known and preferred contraceptive method by the survey participants.

Interviewees explained the reasons that young university students preferred condoms over other family planning methods. For example, a student argued:

> To avoid unintended pregnancies and STIs, I think the best method to use is condoms because using other contraceptive methods will only prevent pregnancy but not sexually transmitted

diseases or infections. Condoms are available at healthcare clinics. Males can also get regular supplies of condoms. (Male 2)

In addition, they reported that condoms are available at healthcare clinics:

I think the best contraceptive for young people is condoms because condoms are available at healthcare clinics and retail outlets. (Male 3)

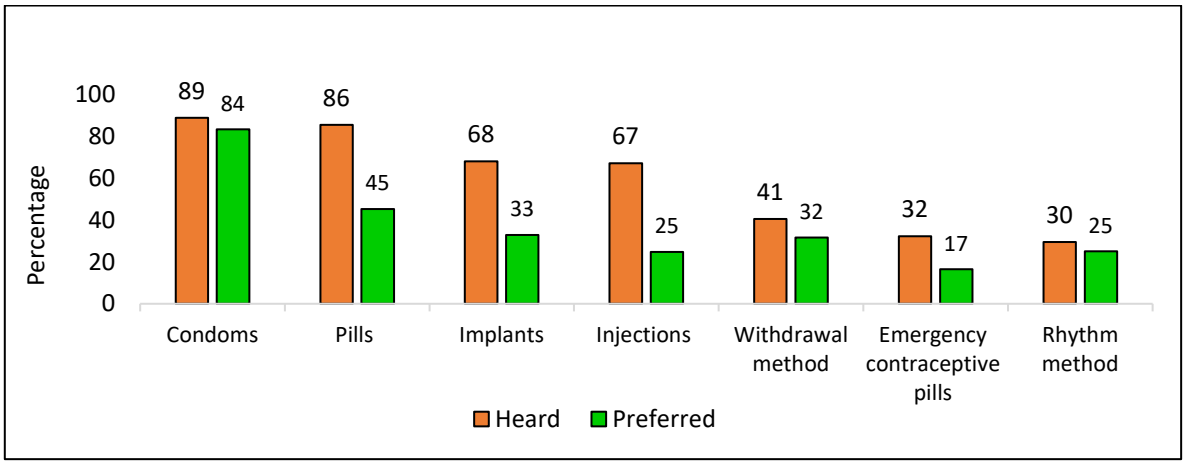

Figure 4.1: Known and preferred contraception methods

4.5.3 Sexual Experiences

Table 4.4 summarises the association of gender, university year level and living on university campuses, with having engaged in sex. Of the 228 survey participants, 66% (n = 151) had engaged in sex, and 34% (n = 81) had not. On average, the male and female participants had four and two concurrent sexual partners, respectively. A statistically significant association was found between gender and having engaged in sex. More males (75%, n = 73) than females (60%, n = 78) had engaged in sex ($\chi^2(1) = 6.154$, $p = 0.013$). The association between living on university campuses and having sex was also statistically significant. Among participants who had sex, more of them resided off university campuses (81%, n = 55) than on campuses (59%, n = 93) ($\chi^2(1) = 9.877$, $p = 0.002$). There was no statistical association between having engaged in sex and university year level. In addition, there were two missing responses in having engaged in sex and university year level and three missing in having engaged in sex and residing on university campuses.

Table 4.4: Pearson's chi-square test for the association of gender, university year level, residing on university campuses with having had sex in lifetime

		Having engaged in sex						
		Yes		No		Total		
		n	%	*n*	%	*n*	%	*p*-value
Gender	Male	73	75	24	25	97	42	**0.013**
	Female	78	60	53	40	131	58	
University year level	Year 1	15	60	10	40	25	11	0.362
	Year 2	36	69	16	31	52	23	
	Year 3	50	60	33	40	83	37	
	Year 4	48	72	18	28	66	29	
Residing on university campuses	Yes	93	59	64	41	157	70	**0.002**
	No	55	81	13	19	68	30	

Note: Total number of participants $n = 228$; total number of participants who had engaged in sex $n = 151$.

A binomial logistic regression was performed to ascertain the effects of age, gender, university year level and residing on university campuses on the likelihood that participants have engaged in sex in their lifetime. The logistic regression model was statistically significant ($\chi^2(6) = 27.85$, $p = 0.000$ ($p < 0.05$), explained 16.5% (Nagelkerke R^2) of the variance in the outcome and correctly classified 66.1% of the cases. Of the four predictor variables, only three were statistically significant: age, gender and residing on university campuses (Table 4.5). Males had 2.10 times higher odds of having sex in their lifetime than females. Increasing age was associated with an increased likelihood of having sex. Participants residing on a university campus were less likely to have sex than those living off a university campus.

Table 4.5: Binomial logistic regression to predict the effects of age, gender, university year level and residing on university campus on the likelihood of having had sex in lifetime

						Odds ratio	95% CI for odds ratio	
	B	SE	Wald	*df*	*p*		Lower	Upper
Age in years	0.20	0.09	4.91	1	0.03	1.22	1.02	1.46

Gender	0.74	0.33	5.24	1	0.02	2.10	1.11	3.98
University year level								
Year 1			1.66	3	0.65			
Year 2	0.47	0.55	0.71	1	0.40	1.59	0.54	4.73
Year 3	0.44	0.53	0.69	1	0.41	1.55	0.55	4.35
Year 4	0.71	0.56	1.61	1	0.21	2.04	0.68	6.15
Residing on university campuses	−1.16	0.38	9.21	1	0.00	0.31	0.15	0.66
Constant	−3.88	2.09	3.44	1	0.06	0.02		

4.5.4 Use of Condoms During Sex

Table 4.6 summarises participants' sexual activities, including their use of condoms. Although 66% (n = 151) of the survey participants had engaged in sex, only 25% had used condoms during their most recent sexual intercourse while, 13% had regularly used condoms during sexual intercourse. There were no differences in these outcomes based on gender.

Table 4.6: Pearsons's chi-square test for the association between gender, having engaged in sex, condom use during most recent sexual intercourse, and regular use of condoms

Question	Answer	Gender						
		Female		Male		Total		
		n	%	*n*	%	*n*	%	*p*-value
Use of condoms during most recent sexual intercourse	Yes	19	50	19	50	38	25	0.849
	No	58	52	54	48	112	75	
Regular use of condoms	Yes	8	42	11	58	19	13	0.405
	No	67	52	61	48	128	87	
You and your partner use another contraceptive method apart from condoms	Yes	26	60	17	40	43	29	0.189
	No	51	49	54	51	105	71	
Your girlfriend become pregnant	Yes			14	19			
	No			55	75			
	I don't know			4	6			

Did you ever become pregnant?	Yes	13	21					
	No	48	79					
Are you concerned about STIs, including HIV?	Yes	46	50	46	50	92	62	0.603
	No	31	54	26	46	57	38	

Apart from using male condoms, 29% ($n = 43$) had used traditional contraceptive methods (withdrawal, rhythm methods) to avoid conception and pregnancy. The majority (71%, $n = 105$) did not use modern contraceptives and mentioned several reasons, such as it was unsafe for young women to use modern contraceptives:

> I think modern contraceptives have some side effects, so it is unsafe for young women to use them. So, for example, pills have side effects. During sex, pills prevent pregnancy but not sexually transmitted diseases. Therefore, I would not recommend pills to young girls because they are unsafe to use. (Male 1)

A female participant viewed hesitancy about using modern contraceptives, including condoms, as stemming from a lack of contraceptive knowledge and shame:

> I think some girls are too afraid to use contraceptives because … they probably don't know the different types of contraceptives, such as condoms and don't feel comfortable using these different contraceptives. For some girls, it is like their first time having sex [shy laughter], and they are confused about how to use contraceptives. Otherwise, some ladies are too ashamed to buy condoms because they are afraid of exposing themselves. (Female 1)

4.5.5 Pregnancy

Concerning pregnancies, 21% of the female participants who had engaged in sex had experienced unintended pregnancies, and 19% of male participants' girlfriends were pregnant. In addition, seven of the 12 interviewees had witnessed someone experiencing an unintended pregnancy at their universities and described it as common among students. A male participant said:

> I am not sure about the other universities, but at my university, I can honestly say that every year girls get pregnant. So, I can say an average of up to three pregnancies yearly. (Male 3)

Since unintended pregnancies were reported as common, interviewees were asked how they would prevent unintended pregnancies, including abortion and STIs, if they were in the position to do so. Many of them expressed a need for structural support, such as access to user-friendly SRH services.

Young university students should be equipped with accurate contraceptive information to avoid unintended pregnancies and STIs, according to one male participant:

> We [young people] are in the stage of intense sexual desire and are more prone to sexual intercourse than older people. So, I think most young people must be equipped with accurate information to prevent diseases, infections and pregnancy. … We can talk all day about abstinence, but you know about young people. Young people can't avoid sexual activities. They are more prone to sex than any other age group, so it's best to equip them with the knowledge and appropriate tools to protect themselves while they are having sex. (Male 2)

Another male participant shared the same views regarding the need for accurate knowledge but also wished SRH services could be established at universities so that sexually active young students could safely access these services:

> As you know, young people in a sexual relationship have sex for pleasure and are not in serious relationships. If I were in a top management position, I would recommend services like VCT [voluntary counselling and testing centres] to be set up in the universities as a fully operating system. So, students caught in sexual relationships like Dulcie and Duncan [the characters from the story-based interviews; see Chapter 3] can feel safe consulting such services within their universities and get condoms. (Male 1)

Yet another male student believed that SRH services should be established at universities because it is unlikely that young people will abstain from sex. Therefore, they should be supported to avoid unintended pregnancies and STIs:

> In university, there are different people with different mindsets. So, for example, when you are at a university and see someone pretty or handsome, sometimes it's uncontrollable. So, I think such healthcare services should provide counselling and help. (Male 6)

A female participant strongly argued that society had failed young people, and in particular, young women, and that an enabling support system needed to be established for those who were too afraid to seek help:

> I think it's society that holds young people back. If people are open-minded, unintended pregnancies and abortion won't hold us back. So let me put it this way. People are so embarrassed to go and get help because our society has fucked us. Our society is fucked up. If you want to do good things, there are other people who will sit down and talk. Think about this: there are groups on Facebook that talk about girls' empowerment. However, when a particular girl needs help, she will not go and get it. I don't know why but I think we are all narrow minded. We are not encouraging each other to seek help.
>
> To stop the embarrassment, we need more women empowerment. We need an enabling support system for young people who are afraid and too ashamed to get help. This is our big problem. Our people need a support system. We do try to do our best, and we try to boost the younger people you know to get help and advice from the experts. However, we can talk, you and I can talk, but it's the society. (Female 2)

4.6 Discussion

This study sought to enhance the understanding of SRH knowledge and sexual practices among young adults in PNG, with a specific focus on university students. It explores their comprehension of contraception, the sources of which they acquire contraceptives and their awareness of STIs in relation to their sexual behaviours. The study also examines how individual, social, and cultural factors influence the SRH experiences of university students.

The analysis results revealed that young university students were sexually experienced. The majority had engaged in sex and had multiple sexual partners. Furthermore, through different stages of formal education, most of this study's participants have acquired general knowledge about coitus, conception and pregnancies. However, they lacked specific reproductive knowledge to prevent pregnancies from occurring. For example, fewer males than females knew about safe and unsafe menstrual cycle days. In addition, less than 20% of the study participants knew the correct use of contraceptives, especially emergency contraceptive pills, to delay and avoid pregnancies. Despite the lack of knowledge on using specific contraceptives, almost all participants knew where to obtain modern contraceptives.

The lack of knowledge about using specific contraceptives among this study's participants may be the reason they did not use them. Traditional family values and religious beliefs have evoked judgemental attitudes towards young people's premarital sexual activities (Cummings, 2008; Hemer, 2019; McMillan & Worth, 2011). Fear of being discovered to engage in sex outside of

marriage made young men and women avoid seeking SRH advice and contraceptives. For instance, being seen obtaining or possessing condoms was described as giving rise to very negative social consequences, such as inviting gossip from young people in Tonga (McMillan & Worth, 2011). Thus, young people's sexual activities are covert, secretive and risky in settings in which societal and religious beliefs lead to disapproval of teenage and premarital sex (McMillan & Worth, 2011).

The findings from this study are consistent with those of similar studies across the globe (Regmi, Simkhada, & van Teijlingen, 2010; Regmi, van Teijlingen et al., 2010). For instance, a substantial proportion of students had experienced premarital sex, including engaging in behaviours that increase their risk of negative sexual health outcomes, despite religious and cultural restrictions (Mitchell & Bell, 2020; R. M. Shrestha et al., 2013). Sexual intercourse with multiple sex partners and inconsistent use of condoms was reported as common among students aged 20 years and above in Nepal (Regmi, Simkhada & van Teijlingen, 2010; R. M. Shrestha et al., 2013). In India, Hindu students were more than two times more likely to have premarital sex than those from other religions (Hindin & Hindin, 2009). Similar findings were reported in Indonesia (Berliana et al., 2018; O'Donnell et al., 2020). Furthermore, premarital sex among undergraduate students leading to unintended pregnancies was also common in China (Li et al., 2017; Ma et al., 2009; Mu et al., 2015; Xiao, 2012; Yip et al., 2013; Yuan et al., 2022; Zhang et al., 2015) and in Africa (Godia et al., 2013; Soura et al., 2018; Yared et al., 2017; Yaya & Bishwajit, 2018; Yibrehu & Mbwele, 2020).

This study has limitations and strengths. First, it was conducted using an online survey. Therefore, the same participants may have attempted the study multiple times using different pseudonyms. Also, participants self-administered the questionnaire, which may introduce biases, particularly when reporting sensitive information such as sexual experiences. Considering this limitation, all survey data were thoroughly checked for duplicated results and cleaned as needed. Next, study participants were recruited using convenience sampling. Therefore, not all university students in PNG were given an equal opportunity to participate in this study. Nevertheless, this study has included a wide range of participant characteristics. Another strength is that this study was carefully designed to employ a mixed methods approach, and thus, the carefully analysed quantitative results and rich qualitative data were integrated.

4.7 Conclusions

Almost all young university students are actively engaged in sexual relationships and demonstrate an understanding of STIs, including the ability to identify symptoms in both males and females. Similarly, almost all understood the importance of contraception and knew where different types of contraceptives could be obtained. However, there are still gaps in their reproductive health knowledge. Their understanding of the menstrual cycle and the proper use of emergency contraceptive pills to prevent unintended pregnancies remains limited. This indicates an urgent need for comprehensive, age appropriate SRH education and resources in these areas.

Chapter 5: University Students' Barriers and Enablers for Accessing Sexual and Reproductive Services in Papua New Guinea

5.1 Chapter Overview

In the previous chapter, I explored the sexual knowledge and experiences of tertiary students and identified barriers to their use of contraceptives and sexual health services. This study revealed the need to also consider the reasons that tertiary students do not access sexual health information or use sexual health services. Therefore, this chapter presents the results that meet Objective 3 of this thesis: analyse barriers to, and enablers of, university students' willingness to access SRH services, including the influence this may have on program (course) completion. Consistent with the outline and layout of Chapter 4, this chapter is presented as a manuscript prepared for submission to *PLOS Global Public Health*. It describes the barriers young people face that hinder their access to SRH information and services. The quantitative results include descriptive and inferential statistics, and the qualitative results provide reasons, views and opinions to assist in extending the analysis of quantitative results.

RESEARCH ARTICLE

University students' barriers and enablers for accessing sexual and reproductive health services in Papua New Guinea: An explanatory sequential mixed methods study.

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5.2 Abstract

Background: Young adults completing tertiary education are at a high risk of contracting sexually transmitted infections (STIs) and experiencing unintended pregnancies because of peer pressure to engage in high-risk behaviours, including excessive alcohol consumption,

casual sex and inconsistent condom use. For them, accessing and using sexual and reproductive health (SRH) services is vital in preventing STIs and the negative consequences of pregnancy, childbirth and induced abortion. Therefore, this study explores university students' experiences of the barriers and enablers to accessing SRH services for health information and treatment in Papua New Guinea (PNG).

Methods: This study was conducted using an explanatory sequential mixed methods study design. Quantitative data were collected through an electronic cross-sectional survey administered to a convenience sample of tertiary students across PNG. Numerical data were analysed using the Statistical Package for the Social Sciences software (version 28), and open-ended responses were analysed using content analysis. The survey results then informed the themes used in collecting qualitative data using a story-based interview. A short story was compiled based on the demographic characteristics of the survey participants, and this story formed the basis for anonymous telephone interviews with purposely selected participants who had completed the cross-sectional survey. Data were transcribed and analysed using framework and thematic analysis. The survey and interviews findings were integrated to answer the research question.

Results: A total of 228 students from six PNG universities participated in this study. Among them, 12 took part in the subsequent telephone interviews. The median age of the study participants was 23 years. The majority were single during the online survey, and 66% had engaged in sexual intercourse. Regarding access to SRH services, less than 20% of the participants visited these services to obtain sexual and reproductive information, such as family planning advice, contraceptives and testing for STIs. In addition, participants residing on university campuses were less likely to visit SRH services for family planning advice, contraceptives and tests for STIs. Most participants were too afraid and ashamed to seek SRH advice and to ask for contraceptives at the established SRH services.

Conclusion: Fewer university students utilised SRH services for contraceptive (family planning) advice, commodities and STI testing and treatment because of the associated shame and stigma. Changing the provision of SRH services to favour young people may improve accessibility. Further, the university and SRH policies need to be changed to incorporate SRH services within the existing on-campus healthcare clinics. In addition, providing healthcare workers with increased training specifically to handle young people's SRH services may

reduce social stigma and the judgemental attitudes of these workers towards unmarried young people.

5.3 Introduction

Transitioning from adolescence to adulthood is a challenging and exciting period for young adults as they begin exploring their sexual identity and sexual relationships (Cassidy et al., 2018; The Society for Adolescent Health and Medicine, 2017). Although sexual relationships yield many physical and emotional benefits, young adults are at risk of negative sexual and reproductive health (SRH) consequences (Cassidy et al., 2018; The Society for Adolescent Health and Medicine, 2017). For instance, young adults undertaking tertiary education are at an increased risk of contracting sexually transmitted infections (STIs) and experiencing unintended pregnancies because of peer pressure to engage in high-risk behaviours, including excessive alcohol consumption, casual sex and inconsistent condom use (Cassidy et al., 2018; Ehrsson et al., 2016; Wana et al., 2019). If left untreated, STIs can lead to pelvic inflammatory disease, ectopic pregnancy and infertility (Cassidy et al., 2018; Hamura et al., 2013; World Health Organization [WHO], 2023c). In Papua New Guinea (PNG), the health of young adults completing tertiary education is compromised by the high STI rates and the low utilisation of SRH services (Kelly-Hanku et al., 2020; Redman-MacLaren, 2020; Mitchell et al., 2021; A. Vallely et al., 2010; L. M. Vallely et al., 2016).

The utilisation of SRH services is vital in preventing STI transmission and the negative consequences associated with pregnancy, childbirth and induced abortion (Birhanu et al., 2018; Feleke et al., 2013). Yet, young people do not use SRH services fully (Brittain et al., 2018; Bylund et al., 2020; Cassidy et al., 2018; Gray et al., 2019; Lowe et al., 2021). For instance, many university students delay and avoid SRH services (Cassidy et al., 2018; Chanakira et al., 2014; Ehrsson et al., 2016; Gray et al., 2019). Consequently, higher rates of unintended pregnancies and STIs have been reported among these young adults (Blidaru et al., 2016; Ehrsson et al., 2016; The Society for Adolescent Health and Medicine, 2017). Further, the low utilisation of SRH services by young adults, including university students, is influenced by multi-level barriers (Burke et al., 2017; Cassidy et al., 2018, 2019; Hock-Long et al., 2003; Thongmixay et al., 2019), such as personal barriers of shame for accessing and possessing condoms (Kennedy et al., 2013, 2014; McMillan & Worth, 2011). Therefore, further research is needed to understand the barriers to SRH services in order to decrease negative SRH consequences and promote positive SRH practices among students (Cassidy et al., 2018; Decker et al., 2021; Wakjira & Habedi, 2022).

In studies regarding access to SRH services in PNG, not much has been reported about barriers and enablers to health-seeking by young adults (Bell et al., 2018). Studies on young people's access to SRH services have focused on pregnant women's antenatal visits (Andrew et al., 2014; Badman et al., 2016; L. M. Vallely et al., 2017, 2019; Wangnapi et al., 2015), emergency hospital admission following ectopic pregnancies (Bolnga et al., 2014; Hamura et al., 2013) and induced abortion (A. Vallely et al., 2015; L. M. Vallely et al., 2014), and on a key population's access to confidential care and treatment (Kelly-Hanku, Redman-MacLaren et al., 2020; Mitchell et al., 2021). Significantly, in PNG, young people comprise almost 50% of the total population (Pryke & Barker, 2017). Therefore, the social and economic effects of healthy, and productive young adults are significant for PNG's development (Pryke, 2017). Young adults undertaking university education are set to contribute meaningfully to PNG's developmental growth. However, their SRH needs, including their lack of utilisation of SRH services, which may impede the completion of their tertiary education, have not been investigated. Therefore, this study explores university students' barriers and enablers to accessing SRH information and services in PNG. The results will be used to identify appropriate strategies to be developed and applied to prevent young adults in the tertiary education sector from succumbing to, or being negatively affected by, STIs, unwanted pregnancies and unsafe abortions.

[Note: Because this chapter has been prepared as a standalone manuscript to be submitted for publication, I again present the methods and the demographic characteristics of this study participants that have been presented in Chapter 4. Please skip the next two sections (5.4: Methods and 5.5.1: Demographic Characteristics of Participants) if you wish to avoid reading the same information. New data are presented from Section 5.5.2.

5.4 Methods

This study was conducted using an explanatory sequential mixed methods design. Quantitative data were collected through an online cross-sectional survey. The survey questions were adapted and modified from the WHO's validated questionnaire for SRH (Cleland, 2001). The cross-sectional survey was administered using Qualtrics XM software through which a survey link was generated and sent as a telephone text invitation message to young university students in PNG. Participants were identified using the convenience sampling technique, and those who consented to participate were sent the survey link allowing self-recruitment into the study. Only participants who consented to participate in the electronic survey were able to attempt the self-administered questionnaire. The survey data were analysed using the Statistical Package for

the Social Sciences software (version 28), beginning with descriptive statistics, followed by inferential statistics using Pearson's chi-square tests for associations and binominal logistical regression for predictions. Open-ended questions were analysed using content analysis (Hsieh & Shannon, 2005). Lastly, the results from the quantitative data informed the development of a story-based interview guide.

Qualitative data were collected through anonymous telephone interviews using a storytelling approach (Sanga & Reynolds, 2023). Interview participants were purposely selected. Telephone text invitation messages were sent to participants who had completed the electronic cross-sectional survey, asking them whether they were interested in explaining and clarifying their survey responses further. Only participants who confirmed they had completed the online survey and consented to be interviewed could participate in Phase 2 of the study. Audio recordings of the interview were transcribed verbatim. Expressions made in a PNG lingua franca (Tok Pisin) were analysed and then translated into English. Qualitative data were analysed in NVivo (version 12) using Braun and Clarke's (2022) thematic analysis approach and Goldsmith's (2021) framework analysis approach in order to understand and visualise participants' narratives. Lastly, the quantitative and qualitative findings were integrated to answer this study's research question.

Ethics approvals were granted by the PNG Medical Research Advisory Committee (MRAC.20.23), James Cook University's Human Ethics Committee (H8319) and Divine Word University's Research Ethics Committee (REC-01/2021).

5.5 Results

5.5.1 Demographic Characteristics of Participants

In all, 228 students (97 males and 131 females) across six universities in PNG completed the online survey (Table 5.1). Of the 228 participants, 12 (six males and six females) were recruited again to participate in the telephone interviews. The ages of these participants ranged from 19 to 32 years. All participants were undergraduate students; the majority were in Year 3 (37%, $n = 88$), whereas the least were in Year 1 (11%, $n = 25$). Most participants (70%, $n = 157$) lived on a university campus. In PNG, universities and tertiary institutions typically provide accommodation for most students.

Table 5.1: Demographic characteristics of participants

Sociodemographic characteristics		Male		Female		Total	
		n	%	*n*	%	*n*	%
Survey respondents		97	42	131	58	228	100
Age	Median (years)	23		22		23	
	IQR (years)	21–24		21–24		21–32	
Relationship status	Single	91	45	111	55	202	89
	Married	6	23	20	77	26	11
Having had sex	Yes	73	48	78	52	151	66
	No	53	69	24	31	77	34
Religion	Catholic	26	42	36	58	62	27
	Anglican	1	25	3	75	4	2
	United Church	7	64	4	36	11	5
	Seventh-Day Adventist	17	32	36	68	53	23
	Revival	5	56	4	44	9	4
	Pentecostal	18	40	27	60	45	19
	Lutheran	14	56	11	44	25	11
	Baptist	5	61	8	39	13	6
	Don’t attend church	4	67	2	33	6	3
Reside on campus	Yes	71	45	86	55	157	70
	No	24	35	44	65	68	30
University year level	Year 1	12	48	13	52	25	11
	Year 2	29	56	23	44	52	23
	Year 3	35	42	48	58	83	37
	Year 4	20	30	46	70	66	29
Lived outside of PNG	Yes	1	17	5	83	6	3
	No	96	42	126	58	222	97
Clinic on campus	Yes	95	42	131	58	226	99
	No	2	100	0	0	2	1

At the time of the survey, more than 80% of the participants self-identified as single and belonging to one of the many Christian denominations in PNG. Furthermore, most participants

originated from only one province in PNG (67%, *n* = 152), whereas others identified as having more than one province of origin (Table 5.2). Almost all participants (97%, *n* = 222) had lived only in PNG (Table 5.1). Hence, their responses, views and opinions reported in this study reflect PNG's sociocultural context, including church affiliation.

Table 5.2: Province of origin

Province of origin: Number	*n* = 228	%
One	152	67
Two	54	24
Three	17	7
Four	5	2

5.5.2 Barriers and Enablers to University Students Accessing Sexual and Reproductive Health Services

Consistent with the story-centred approach used throughout this study, first, a data-informed story of two young adults' sexual relationship journey while currently attending a university in PNG is shared in this section (Figure 5.1).

Meet Dulcie and Duncan, two young, ambitious university students. Dulcie, a third-year student, comes from a multicultural family with roots in East Sepik Province, East New Britain Province and Milne Bay Province. She is a devoted Catholic and regularly visits her family's ancestral villages. Duncan, also a third-year student, comes from a family with ties to East Sepik and Simbu Provinces. He is a member of the Seventh-Day Adventist Church and enjoys visiting his family's villages.

Despite their different religious backgrounds, Dulcie and Duncan share an unbreakable bond that has been blooming for the past six months. Their relationship has been kept secret from their peers and dormitory mates, but their love for each other has only grown stronger.

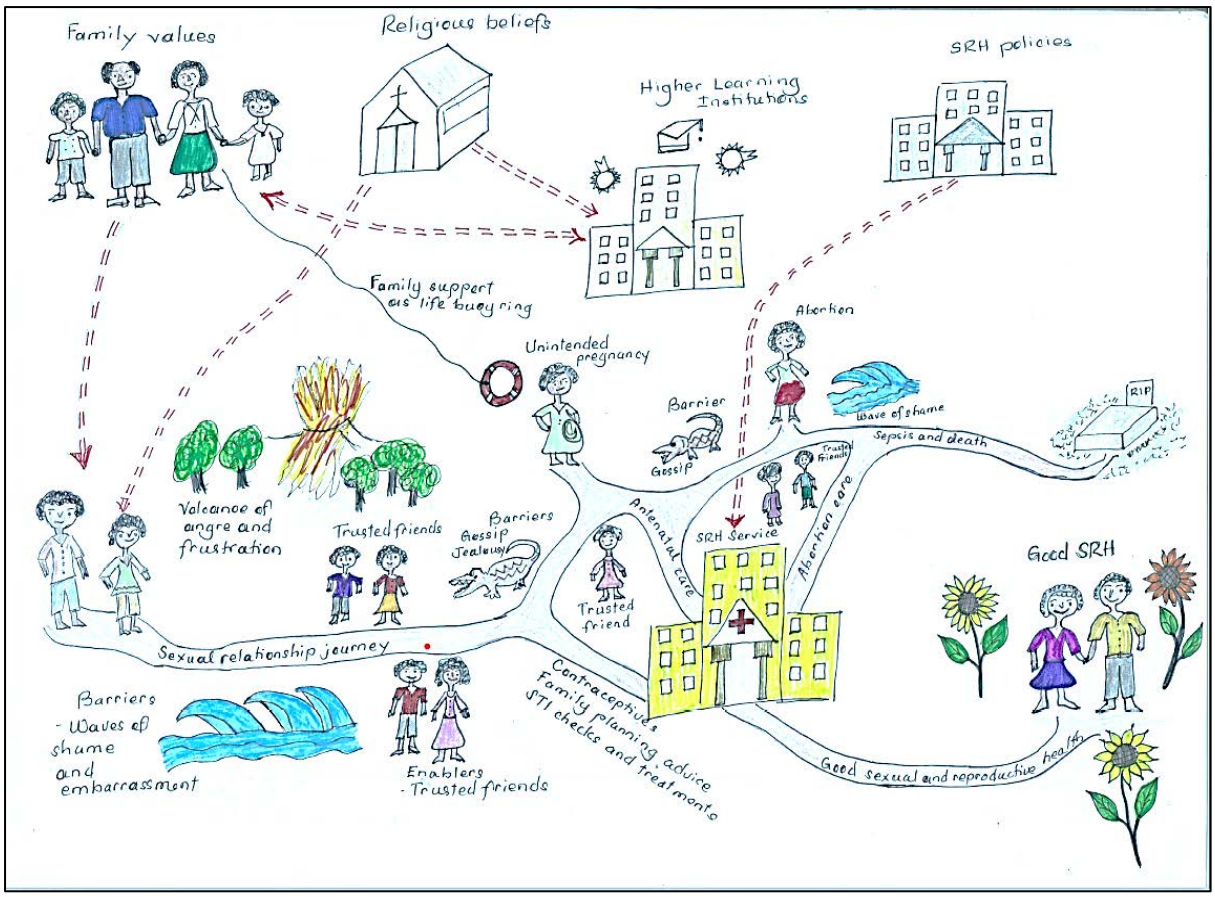

Figure 5.1: Barriers and enablers to young adults enjoying good sexual and reproductive health in PNG

As Dulcie and Duncan embarked on a romantic relationship journey, they shared intimate moments, forging deep emotional and physical connections. However, they also encountered barriers, such as waves of shame and embarrassment when seeking to obtain and use contraceptives from either retail outlets or sexual health clinics. They are also aware of the expectations that they will maintain family values and, specifically, will abstain from premarital sex, which may result in an unintended pregnancy. They are fearful and frustrated that friends and peers may gossip and spread misleading information about them, which will likely tarnish their name and bring shame to their families. As they progress deeper into their sexual relationship, they continue to be ashamed of buying condoms and contraceptives. However, they also share their needs with trusted friends, and these friends enable them to have protected sex by providing them with condoms.

In almost all situations that Dulcie may find herself in, for example, if she were to fall pregnant, she would encounter barriers and enablers at the personal, institutional and community levels. This ends the story of these two young adults' sexual relationship journey. Next, the integrated results from the survey and interviews regarding young tertiary students' access to SRH services are presented.

The survey results revealed that only 18% of the respondents (n = 40) had sought SRH information, such as family planning advice, at the healthcare services. In addition, 19% (n = 42) had obtained modern contraceptives, including condoms, at SRH clinics, and 15% (n = 16 males, 18 females) had been to sexual healthcare clinics for STI testing and treatment. Most of the participants who did not access SRH services provided the following reasons (see Table 5.3).

Table 5.3: Participant's reasons for not accessing SRH services

	Reason	%
Reasons for not visiting SRH services to obtain information	I get SRH information from books and the internet.	51
	The service is for married women only.	19
	I don't want to be seen.	17
	I don't know about this service.	13
	I am not sexually active.	2
Reasons for not visiting SRH services to obtain contraceptives	I don't want to be seen.	23
	I don't use modern contraceptives.	21
	I get condoms from the shops.	17
	I don't know about this service.	13
	I am not sexually active.	11
	It is not my responsibility to get condoms.	8
	I dislike healthcare providers' attitudes.	7
Reasons for not visiting SRH services to obtain a proper STI diagnosis	I don't have the need for this service.	63
	I don't want to be seen.	15
	I am afraid of knowing I am HIV positive.	11
	I dislike healthcare providers' attitudes.	6
	I am afraid of my partner.	5

Furthermore, of the survey participants who visited SRH services to obtain contraceptives and for STI testing and treatment, almost 50% (n = 33) felt uncomfortable discussing their sexual health problems with the healthcare providers. In addition, 40% stated it was difficult to ask for condoms at the healthcare clinics. No association was found between feeling comfortable asking questions at healthcare clinics and all variables of interest, p-values > 0.05. Interview participants explained that many students felt ashamed asking for condoms, and embarrassment was a factor explaining why young men and women do not seek SRH advice at the existing SRH services, such as a Marie Stopes clinic:

> One of the challenges is the feeling of shame, especially asking for condoms at the clinics. … Many students are ashamed to visit clinics to get contraceptives, thus resulting in unwanted pregnancies. (Male 4)

> I don't think young girls get advice from Marie Stopes. Young girls are embarrassed. (Female 2)

> There is a clinic, but I don't know if the girls ever went there. I don't know. (Female 3)

If you are ashamed of getting help from the hospital. What is your opinion on how the healthcare system such as hospitals may organise themselves so that young people like you who are shy may feel free to go and get help?

> To answer this question, if you know someone working at the hospital, you can make private arrangements with them. If I want to get condoms or things to do with sexual health, I will arrange to meet a male health worker privately during lunch hour, not during official working hours inside the hospital. As a man, it will be easy for me to interact with a male health worker. (Male 5)

Most of the female interviewees expressed fear of being exposed and reported to university deans for engaging in sexual intercourse, which resulted in unintended pregnancies and STIs, and thus, they avoided visiting SRH services.

> Some young ladies are too ashamed and afraid of going, seeking help from those places [SRH services]. In case they go to a university clinic, they might get reported or something like that. Yes, most girls indeed get scared of going through. They are afraid of being reported. (Female 1)

> They [young women] feel ashamed of themselves because other girls are not doing the thing [having sexual intercourse] that they are doing. Shame, and the other thing is [they are] scared. They are scared because the other girls might report them to the Dean Mama [dean of girls] or report to the lecturer or tutor. So, I think that is why girls don't want to share their sexual problems with others. (Female 5)

One of the reasons these young adults kept their sexual relationship a secret was to avoid gossip. When a female participant was asked whether girls gossip about each other, she replied with a burst of loud laughter:

> Yes, they do gossip. Gossip is like a mother tongue. (Female 5)

Despite the participants' fear of becoming the focus of gossip and being reported, some have accessed condoms. A male participant mentioned that he would visit SRH services because his SRH as well his girlfriend's health, is important:

> As for me, I'll not hesitate to go because my safety, my future and my girlfriend's future are important. So, I will not hesitate to go to the clinics to prevent such things [unprotected sex] from resulting in pregnancy. I don't want to regret those things [unintended pregnancy/STIs] later. (Male 3)

A male participant explained that if his girlfriend became pregnant, he would inform only his trusted friends about this pregnancy because it would be an embarrassing situation:

> If my girlfriend is pregnant, I will bring the situation to my inner circle, not more people. Only those friends who are close to me. I feel this is not something to share. Because, at the student level, it is embarrassing that people get to know that you are still a student and have done things like that [unprotected sex]. It is also a headache for our parents as well. Parents think you are there to study, but you are doing something opposite to what they expect. So, I wouldn't like to be enthusiastic about telling everyone but those who will support me. (Male 6)

Female participants mentioned that they were helpful and supportive towards their friends who became pregnant:

> Yes. In a situation like that, girls are very helpful. If only she opens up to them. They wouldn't know if she didn't tell them about her situation. But if she feels open to telling her friends. Her friends can help her. (Female 5)

> Yes, I will help her by giving advice. Just a while ago, I helped one of my friends who was pregnant and left school and is coming back next semester. If you want to come back, you must use one of the family planning methods before returning to school. Do not return without contraceptives. (Female 6)

> What I did was support those who told me that 'I am in this situation right now'. But I pretended I didn't know anything for those who wanted to hide [their pregnancy]. (Female 4)

Table 5.4 presents the associations of gender, having engaged in sex, university year level, residing on university campuses and region of origin with accessing SRH services to obtain SRH information. There was a significant association between living on university campuses and visiting SRH services to obtain SRH information. Significantly more participants (29%, $n = 20$) living off university campuses had utilised healthcare services to obtain SRH information than those living on campuses (13%, $n = 20$) ($\chi^2(1) = 8.615$, $p = 0.003$). Another significant association was found between having engaged in sex and visiting SRH services to obtain SRH information. More participants who had engaged in sex (23%, $n = 34$) had obtained SRH information from sexual healthcare clinics than those who had not engaged in sex (8%, $n = 6$) ($\chi^2(1) = 7.985$), $p = 0.005$). The third significant association was found between university year level and visiting SRH services to obtain SRH information. Fewer year three students (10%, $n = 8$) had acquired SRH information from healthcare clinics than students from other years ($\chi^2(3) = 9.196$, $p = 0.027$). No statistical associations were found between gender and visiting SRH services to obtain SRH information ($\chi^2(1) = 0.141$, $p > 0.05$) and between the region of origin and visiting SRH services for this purpose ($\chi^2(3) = 2.928$, $p > 0.05$).

Table 5.4: Pearson's chi-square test for the association of gender, having engaged in sex, university year level, residing on university campuses and region of origin with visiting healthcare services to obtain SRH information

		Visit SRH services to obtain SRH information						
		Yes		No		Total		
		n	%	*n*	%	*n*	%	*p*-value
Gender	Male	16	17	80	83	96	43	0.707
	Female	24	9	105	81	129	57	
	Yes	34	23	114	77	148	66	**0.005**

Having engaged in sex	No	6	8	71	92	77	34	
University year level	Year 1	6	24	19	76	25	11	**0.027**
	Year 2	8	16	43	84	51	23	
	Year 3	8	10	75	90	83	37	
	Year 4	18	28	46	72	64	29	
Residing on university campuses	Yes	20	13	134	87	154	69	**0.003**
	No	20	29	48	71	68	31	
Region of origin	Momase	17	14	101	86	118	53	0.403
	Highlands	12	24	37	76	49	22	
	Southern	6	23	20	77	26	12	
	New Guinea Islands	5	17	25	83	30	13	

Binomial logistic regression was performed to ascertain the effects of gender, having had sex in a lifetime, residing on a university campus, university year level and region of origin on the likelihood that participants had visited sexual health services to obtain SRH information. The logistic regression model was statistically significant ($\chi^2(9) = 25.12$, $p = 0.003$), explained 17.7% (Nagelkerke R^2) of the variance in the outcome and correctly classified 83.6% of cases. Of the five predictor variables, only two were statistically significant: residing on university campuses and having engaged in sex (Table 5.5). Participants residing on university campuses were less likely to visit health services to obtain SRH information than participants residing off university campuses. However, participants who had engaged in sex had 3.17 times higher odds of visiting healthcare services to obtain SRH information than participants who did not have sex.

Table 5.5: Binomial logistic regression predicting the likelihood of visiting SRH services to obtain SRH information based on gender, having had sex, residing on university campuses, university year level and region of origin

						Odds	95% CI for odds ratio	
	B	SE	Wald	*df*	*p*	ratio	Lower	Upper
Gender	0.01	0.408	0.01	1	0.98	1.01	0.46	2.25
Residing on university campuses	−0.84	0.41	4.07	1	0.04	0.43	0.19	0.98
Having had sex	1.15	0.50	5.38	1	0.02	3.17	1.20	8.38

University year level								
Year 1			6.31	3	0.10			
Year 2	−0.54	0.65	0.69	1	0.41	0.59	0.17	2.08
Year 3	−0.77	0.66	1.36	1	0.24	0.47	0.13	1.69
Year 4	0.35	0.61	0.33	1	0.57	1.42	0.43	4.69
Region of origin								
New Guinea Islands			2.30	3	0.40			
Momase	−0.26	0.60	0.18	1	0.67	0.77	0.24	2.52
Highlands	0.52	0.64	0.66	1	0.42	1.69	0.48	5.96
Southern	0.21	0.73	0.09	1	0.77	1.24	0.30	5.12
Constant	−1.64	0.80	4.24	1	0.04	0.19		

Note: Gender is for males compared with females; having engaged in sex is for yes compared with no; university year level is for Years 4, 3 and 2 compared with Year 1; students residing on university campuses is for residential students compared with students residing off university campuses; and region of origin is for Momase, Highlands and Southern regions compared with New Guinea Islands region, respectively.

A statistically significant association was found between having engaged in sex and visiting healthcare clinics to be tested for STIs. Significantly, more participants who had engaged in sex (21%, $n = 32$) had visited healthcare clinics to be checked and tested for STIs than had participants who had not had sex (3%, $n = 2$) ($\chi^2(1) = 14.03$, $p = 0.001$). The second statistically significant association was between residing in university dormitories and visiting healthcare clinics for STI tests. A lower proportion of participants who resided on university campuses (12%, $n = 18$) visited sexual healthcare clinics for STI tests than participants living off university campuses (22%, $n = 15$) ($\chi^2(1) = 4.\ 17$, $p = 0.041$). In contrast, no statistically significant association was found between gender, university year level and region of origin with visiting sexual healthcare clinics (see Table 5.6).

Table 5.6: Pearson's chi-square test for the association of gender, having had sex in a lifetime, university year level, residing in university dormitories and region of origin with visiting healthcare clinics to be tested for STIs

	Visit sexual healthcare clinic service to be tested for sexually transmitted infections						
	Yes		No		Total		
	n	%	*n*	%	*n*	%	*p*-value

Gender	Male	16	17	80	83	96	42	0.542
	Female	18	14	113	86	131	58	
Having engaged in sex	Yes	32	21	118	79	150	66	**0.001**
	No	2	3	75	97	77	44	
University year level	Year 1	6	24	19	76	25	11	0.264
	Year 2	8	16	43	84	51	23	
	Year 3	8	10	75	90	83	37	
	Year 4	12	18	54	82	66	29	
Residing on university campuses	Yes	18	12	138	88	156	70	**0.041**
	No	15	22	53	78	68	30	
Region of origin	Momase	16	13	104	87	120	53	0.696
	Highlands	10	20	39	80	49	22	
	Southern	4	15	22	75	26	12	
	New Guinea Islands	4	13	26	87	30	13	

Table 5.7 presents the associations of gender, having engaged in sex, university year level and region of origin with visiting SRH services to obtain condoms and other modern contraceptive methods. There was a statistically significant association between gender and visiting SRH services to obtain contraceptives. Significantly more males (11%, $n = 25$) than females (8%, $n = 17$) had visited SRH services to obtain contraceptives ($\chi^2(1) = 5.81$, $p = 0.016$). The association between having had sex and visiting SRH services to obtain contraceptives was also statistically significant. Significantly more participants who had engaged in sex (17%, $n = 39$) visited SRH services to obtain contraceptives than participants who had not had sex (1%, $n = 3$) ($\chi^2(1) = 16.21$, $p = 0.000$). Furthermore, the association between residing in university dormitories and visiting SRH services to obtain contraceptives was statistically significant. More residential participants (59%, $n = 132$) than non-residential participants (22%, $n = 49$) did not visit SRH services to procure contraceptives ($\chi^2(1) = 5.31$, $p = 0.021$). In comparison, there were no statistically significant associations between university year level and visiting SRH services to obtain contraceptives ($\chi^2(3) = 2.719$, $p > 0.005$) and between the region of origin and visiting SRH services to obtain contraceptives ($\chi^2(3) = 3.630$, $p > 0.005$).

Table 5.7: Pearson's chi-square test for the association of gender, having had sex, university year level, residing on university campuses and region of origin with visiting SRH services to obtain modern contraceptives

		Visit SRH services to obtain contraceptives						
		Yes		No		Total		
		n	*%*	*n*	*%*	*n*	*%*	*p*-value
Gender	Male	25	26	72	74	97	43	**0.016**
	Female	17	13	112	87	129	57	
Having had sex	Yes	39	26	111	74	150	66	**0.001**
	No	3	4	73	94	76	34	
University year level	Year 1	7	28	18	72	25	11	0.437
	Year 2	9	17	43	83	52	23	
	Year 3	12	15	70	85	82	37	
	Year 4	14	22	51	78	65	29	
Residing on university campuses	Yes	23	15	132	85	155	70	**0.021**
	No	19	28	49	72	68	30	
Region of origin	Momase	22	18	97	82	119	53	0.304
	Highlands	10	30	40	70	50	22	
	Southern	2	8	24	92	26	12	
	New Guinea Islands	8	28	21	72	29	13	

A binary logistic regression was performed to examine the effects of gender, having had sex, residing on a university campus, university year level and region of origin on the likelihood that participants have visited SRH services to obtain contraceptives. The logistic regression model was statistically significant, ($\chi^2(9) = 36.85$, $p = 0.000$), explained 24.8% (Nagelkerke R^2) of variance in the outcome, and correctly classified 80% of the cases. Of the five predictor variables, only three were statistically significant: gender, having had sex and region of origin (Table 5.8). Male participants were 2.67 times more likely to visit SRH services to obtain contraceptives than female participants. Participants who had had sex were 8.28 times more likely to have visited SRH services to procure contraceptives than participants who had not had

sex. Although an association existed between the region of origin and visiting healthcare clinics to obtain contraceptives, this result should be interpreted with caution because of the small sample size in this analysis.

Table 5.8: Logistic regression predicting the likelihood of visiting a healthcare clinic to obtain contraceptives based on gender, having had sex, residing on university campuses, university year level and region of origin

							95% CI for odds ratio	
	B	SE	Wald	*df*	*p*	Odds ratio	Lower	Upper
Gender	0.983	0.415	5.622	1	0.018	2.672	1.186	6.022
Having had sex	2.114	0.638	10.976	1	0.001	8.280	2.371	28.913
University year level								
Year 1			3.054	3	0.383			
Year 2	−0.809	0.660	1.501	1	0.221	0.445	0.122	1.625
Year 3	−0.747	0.653	1.307	1	0.253	0.474	0.132	1.705
Year 4	−0.145	0.645	.050	1	0.823	0.865	0.244	3.065
Residing in university campuses	−0.610	0.416	2.150	1	0.143	0.543	0.240	1.228
Region of origin								
New Guinea Islands			5.977	3	0.113			
Momase	−1.036	0.563	3.388	1	0.066	0.355	0.118	1.069
Highlands	−0.828	0.628	1.739	1	0.187	0.437	0.128	1.495
Southern	−2.082	0.910	5.237	1	0.022	0.125	0.021	0.742
Constant	−1.825	0.865	4.457	1	0.035	0.161		

Note: Gender is for males compared with females; having had sex is for yes compared with no; university year level is for Years 4, 3 and 2 compared with Year 1; residing in university dormitories is for residential students compared with non-residential students; and region of origin is for Momase, Highlands and Southern regions compared with New Guinea Islands region.

5.6 Discussion

This study sought to analyse university students' barriers to and enablers of accessing SRH services, including the influence this may have on their program completion. The high transmission rates of STIs and deteriorating healthcare services compromise the SRH of tertiary students in PNG. The results showed that less than 20% of participants had accessed

existing SRH services in PNG to obtain SRH information, such as family planning advice; contraceptives; and STI tests and treatments. In addition, personal barriers of shame, including embarrassment and fear of being reported, were the reasons provided by the majority of participants for such low utilisation of SRH services. Furthermore, predictive values showed that students residing on university campuses were less likely to use SRH services. However, university students who had sex are three times more likely to visit SRH services for family planning advice, contraceptive commodities, such as condoms, and STI testing and treatments. Sexually experienced university students visiting SRH services amidst social stigma and judgemental attitudes do so through the support given to them by their trusted friends.

Personal barriers such as embarrassment and fear hindering the utilisation of SRH services in PNG are not unique to university students only. Pregnant women desiring formal antenatal care also suffer from shame and fear (Baigry et al., 2023). For example, a study about factors affecting the attendance and timing of formal antenatal care in Madang, PNG, revealed that adolescents, single pregnant women for whose pregnancy no man acknowledges responsibility and married women without good birth spacings were stigmatised (Andrew et al., 2014). Nurses openly scolded and shamed many of these pregnant women, resulting in their delaying and avoiding quality antenatal care (Andrew et al., 2014). In addition to the judgemental attitudes of healthcare providers in resource-poor settings such as PNG, young adults' perceptions and reflections on the provision of SRH services determine their health-seeking behaviours and decisions about when to seek and ask for help (Hinton & Earnest, 2011). Non-judgemental and kind healthcare workers providing SRH services were described as desirable by young people in Vanuatu and may contribute to increased uptake of SRH services (Kennedy et al., 2013, 2014).

Consistent with this study's findings, studies about young people's barriers and enablers to accessing SRH services in another low middle-income country, Ethiopia, showed that only a small proportion of young people had used SRH services (Birhanu et al., 2018; Feleke et al., 2013; Wakjira & Habedi, 2022). The feeling of shame, fear of being seen by others, poor perceptions of SRH services, restrictive cultural norms and lack of confidentiality deterred them from using these services (Birhanu et al., 2018). Similar personal barriers, such as shame, fear of being seen or scolded, were also reported in studies conducted in other Pacific Island Countries and Territories (Hemer, 2019; Kennedy et al., 2013, 2014; O'Connor et al., 2019). In addition, healthcare providers' negative attitudes towards unmarried young people

discourage their use of SRH services (Homer et al., 2018; Tilahun et al., 2012). Young adults may delay seeking SRH services because they have inadequate or incorrect information regarding the location of services and their eligibility for care, they may not be planning to have intercourse or they have easy access to condoms (Hock-Long et al., 2003). Furthermore, the presence of multi-level barriers to the use of SRH services, including university polices and social attitudes found in the present study, have been reported in others (Gottschalk & Ortayli, 2014; Wakjira & Habedi, 2022). Strategies that include a safe space to empower and build an individual's confidence may overcome some barriers to accessing SRH services.

This study has limitations and strengths. The limitations are that the self-administered online survey may have allowed some participants to attempt the study multiple times, and the convenience sampling method used may have resulted in unequal opportunities for university students in PNG to participate. However, the survey data underwent a thorough cleaning process, and duplicated responses were removed before data analysis. The study's strengths lie in its consideration of a wide range of participant characteristics and its use of the mixed methods approach that integrates quantitative results with rich qualitative data.

5.7 Conclusion

Few university students have utilised SRH services for contraceptive (family planning) advice and commodities and for STI tests and treatments. In addition, as most students residing on campus had additional personal and institutional barriers, they were less likely to access SRH services than were students residing off university campuses. Therefore, structural facilitators, beginning with changes to higher education policies and SRH health policies regarding the provision of SRH services, are needed to improve SRH for tertiary students. University and SRH policies could incorporate SRH services within the existing healthcare clinics on university campuses to improve accessibility. There is also a need to increase healthcare workers training specifically to handle young people's SRH services to reduce social stigma and the judgemental attitudes of healthcare workers towards unmarried young people.

Chapter 6: Discussion

6.1 Chapter Overview

This chapter extends the research findings through the application of the socio-ecological model (SEM) as an explanatory framework, including a critical analysis of key concepts. It also evidences the successful fulfilment of Objective 4 of the study: apply the socio-ecological model to identify and map key recommendations that will inform and improve the SRH of university students.

6.2 Purpose of the Study Revisited

This explanatory sequential mixed methods study aimed to describe and understand factors that influence the SRH of young people in PNG and its relationship to their successful completion of tertiary (university) education. The study findings provide evidence of the challenges these young adults face in seeking accurate SRH information and quality services to avoid STIs and unintended pregnancies. In addition, these findings will inform health and higher education services, along with policymakers, in developing and applying appropriate strategies to prevent the future generations of educated young adults from experiencing the negative effects of STIs and unplanned pregnancies. Specifically, this mixed methods study sought to:

- Describe the SRH knowledge and practices of university students.
- Explore and explain the individual, social and cultural factors that influence the SRH of university students.
- Analyse barriers to, and enablers of, university students' willingness to access SRH services, including the influence this may have on program (course) completion.
- Apply the socio-ecological model to identify and map key recommendations that will inform and improve the SRH of university students.

6.3 Summary of Key Findings

The study results showed that many young adults who are enrolled for tertiary education in PNG are sexually experienced. The majority of study participants have engaged in sex and have had multiple sexual partners. Furthermore, through formal or informal education, most of

them have acquired a general understanding of coitus, conception and pregnancy. However, these participants lacked accurate, specific knowledge about reproduction to prevent the occurrence of pregnancies. For example, fewer males than females knew about the safe and unsafe days in a menstrual cycle. In addition, less than 20% of the study participants knew the correct use of oral contraceptives and emergency contraceptive pills to delay and avoid pregnancies. Despite the lack of knowledge about using specific contraceptives, almost all participants knew where to obtain modern contraceptives but may avoid using existing SRH services because of multifaceted physical, social and cultural barriers. The results showed that less than 20% had visited SRH services to obtain SRH information, STI tests and contraceptives.

Shame, embarrassment and the fear of being reported to family members or other authorities were the main reasons for participants' low utilisation of SRH services. They did not want to violate family values and expectations or tertiary institutions' policies. Furthermore, students residing on university campuses were less likely than those living off campus to use SRH services, indicating that the present provision of on-campus SRH services does not meet students' need. Unsurprisingly, sexually experienced university students were three times more likely than non-sexually active students to visit SRH services for family planning advice, contraceptives such as condoms and STI testing and treatments. Moreover, the sexually experienced university students who have visited SRH services despite social stigma and the judgemental attitudes of community members and some healthcare providers, attended with support given to them by trusted friends. Last, the study participants recommended greater structural support be provided within university campuses to enable easy, timely and safe access to SRH information and services.

6.4 Socio-ecological Model

I applied the SEM to the findings of this study because it demonstrates the complex interplay between individuals, their relationships with others, community norms and practices and societal factors (Centers for Disease Control and Prevention, 2022). In this study, applying the SEM enables an understanding of the factors that place young people at risk of poor SRH and suggests an enhanced understanding and possible actions by simultaneously examining the key issues across multiple model levels.

The SEM is a theoretical framework that describes the interactive characteristics of individuals and the physical, social and policy environments that underlie health outcomes (Glanz et al., 2015; Golden & Earp, 2012; Mehtälä et al., 2014). According to Glanz et al. (2015), this model recognises multiple levels of influence on, for example, a person's health behaviours at the intrapersonal, interpersonal, institutional or organisational, community and public policy levels. At the intrapersonal level, personal factors, such as knowledge, attitudes, beliefs and personality, influence behaviours (Rural Health Information Hub, 2022). At the interpersonal level, interactions with other people, such as family members, friends and teachers, can both provide social support and create barriers to healthy SRH behaviours. Furthermore, rules, regulations, policies and informal structures can constrain or promote healthy SRH behaviours at the institutional and organisational levels. Community-level factors, such as formal or informal social norms among individuals, groups or organisations, can limit or enhance healthy behaviours. At the public policy level, local, state and federal policies and laws that regulate or support health actions and practices for disease prevention, early detection, control and management affect individuals' health behaviours (Glanz et al., 2015; Golden & Earp, 2012).

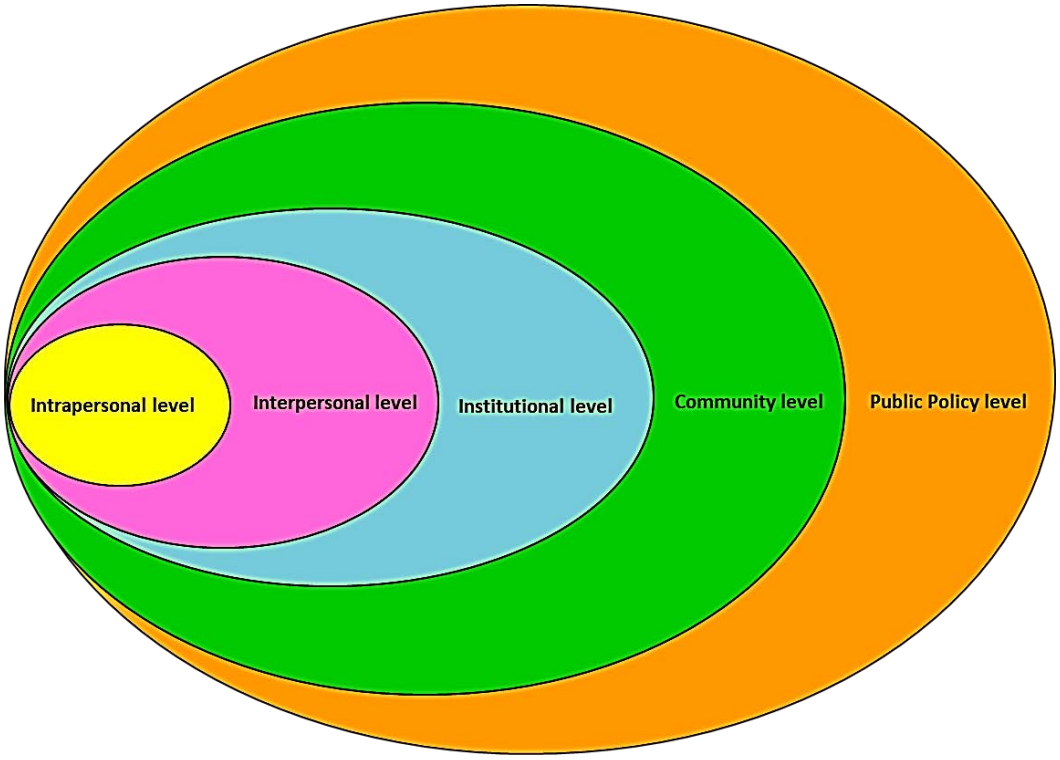

Figure 6.1: Socio-ecological model (adapted from Rural Health Information Hub, 2022)

The SEM was originally proposed by Uri Bronfenbrenner in 1970 as a theory of human development (Rosa & Tudge, 2013). Bronfenbrenner posited that an individual's development is influenced by their interaction with their environment. This includes factors such as interactions with their parents, friends, school, work and culture, which shape their growth and behaviour (Bronfenbrenner, 1979; Rosa & Tudge, 2013). When Bronfenbrenner developed this theory, he felt that traditional developmental psychology studies were limited to individual influences observed in unnatural settings, such as laboratories, rather than in natural environments, such as homes or childcare centres. Therefore, he developed his ecological systems theory, which postulates that various environmental factors at different levels can affect a child's development, from immediate people and institutions surrounding the individual to broader cultural forces across the nation (Bronfenbrenner, 1979).

Although the SEM was originally proposed for studying child development and psychology (Bronfenbrenner, 1979), the model is now regularly applied in public health in response to a range of health conditions across the globe, and the Centers for Disease Control and Prevention (2022) has applied it as a framework for disease prevention.

6.5 Situating Study Findings within the Socio-ecological Model

The complex interaction between humans and their environment involves many factors. The complexity of this interaction necessitates findings to be discussed in one or more than one of the SEM levels. For instance, the issue of shame resulting from cultural barriers is examined within the intrapersonal, interpersonal and community levels, given that each level contributes an understanding of how and why individuals experience shame in relation to their SRH.

6.5.1 Intrapersonal Level

At the intrapersonal level, personal factors, such as knowledge, attitudes, beliefs and personality, influence individual perceptions and behaviours (Centers for Disease Control and Prevention, 2022; Rural Health Information Hub, 2022). For example, SRH knowledge could assist individuals' decision-making concerning STI prevention and when to use contraceptives, depending on their desire to bear a child (Leekuan et al., 2022), whereas their attitudes towards contraceptives will influence decisions about their use (Jahanfar & Pashaei, 2022).

Knowledge

Young adults' SRH knowledge is shaped by their cultural and church-affiliated beliefs and their individually acquired knowledge through formal or informal education. In this study, their general knowledge about reproduction, STIs and contraceptives, including about places to obtain modern contraceptives, such as condoms, was mostly accurate. However, participants did not demonstrate an in-depth understanding of the menstrual cycle and the correct use of oral and emergency contraceptive pills to delay and avoid unplanned pregnancies. For instance, young adults understood that hormonal contraceptives, such as oral contraceptive pills, prevent pregnancies but not the acquisition of STIs. Therefore, they preferred to use condoms because condoms protect them from acquiring STIs and experiencing unintended pregnancies.

This finding is consistent with the findings of a study conducted among Year 11, 12 and 13 students in public secondary schools in Suva, Fiji, that revealed they had inadequate knowledge to prevent unplanned pregnancies (Ram & Mohammadnezhad, 2022). Although most students knew about the negative consequences of teenage pregnancy, they did not know the various methods to prevent pregnancy (Ram & Mohammadnezhad, 2022). Thus, the evidence suggests there is an opportunity to increase the education of young people about conception, pregnancy and contraceptives to help reduce the high, and even soaring, rates of teenage pregnancy in some PICTs (Harrington et al., 2021; NDoH, 2013; National Statistical Office, 2019; Solomon Islands National Statistics Office, 2017). In addition, understanding the individual knowledge drivers of STIs and their association with birth control methods is equally important (Deese et al., 2021). Findings from 1,365 adolescents and young adults in the 2011-2013 National Survey of Family Growth in the United States revealed that oral contraceptive users had a higher likelihood of having multiple sexual partners, acquired STIs and developed pelvic inflammatory disease (Fehring et al., 2018)

These findings are directly relevant to the objectives of my study, given that I sought to describe university students' SRH knowledge, that is, awareness about the safe and unsafe days in a menstrual cycle, emergency contraceptive pills and the use of condoms to prevent unintended pregnancies and STI acquisition. The correct use of condoms as a barrier method prevents the exchange of seminal and vaginal body fluids, thus lowering the possibility of conception and some STI transmission (WHO, 2023b).

Having discussed the application of individual knowledge in relation to good SRH, next, I discuss individuals' attitude and beliefs that influence their SRH-seeking behaviours.

Attitude and Beliefs Influence SRH-seeking Behaviours

Individuals' health-seeking behaviours are influenced by household beliefs, community norms and expectations and healthcare providers' characteristics and behaviours. The collective culture of PNG emphases strong family ties and a sense of duty to respect and uphold the family name and tradition (Hukula, 2017). Thus, the study participants, as well as the healthcare providers described in this study, were raised in PNG's collective society, which values strict adherence to values and emphasises collective action and group harmony (Gantt, 2020). Growing up, this study's young men and women may not prioritise individualistic thoughts or actions. Instead, their attitudes and behaviour reflected their cultural values and church-affiliated beliefs in line with family's expectations and norms.

University students' attitude of not actively seeking SRH services is to keep their premarital sexual activities hidden from other people, including family members, to maintain the family's expectations (Baigry et al., 2023). Young adults who openly engage in premarital sex bring shame and dishonour to the family and clan, which may result in the family's discontinuation of financial and social support to them, such as unwillingness to pay tuition fees. This would have serious personal and collective consequences for the student, their family and their clan. Thus, participants in this study felt obligated to comply with their family's and clan's expectations because the family and extended family members have supported them with tuition fees. For these reasons, sexually active participants were secretive in their sexual activities; for instance, they obtained condoms and STI medication, including abortion pills, from pharmacies.

The finding of this study of the effects of the collective society on individual SRH-seeking behaviour is consistent with those of studies among young people in other PICTs. A study about the impact of the sociocultural context on young people's condom use in Tonga shed light on the mismatch between interviewees' attitudes and practices (McMillan & Worth, 2011). The study found that despite participants' endorsement of condoms as a barrier contraceptive, very few of them used these regularly or even occasionally. The underlying reason is that personal attitudes towards condom use are significantly influenced by social expectations, gender norms and cultural values prevalent in the community and among peers,

which creates a complex interplay that discourages many adults from using condoms (McMillan & Worth, 2011).

Young adults attending university education in PNG have inadequate support to prevent pregnancy and STIs. One such area in which support is lacking is the environment in which SRH knowledge can be translated into action. Although the young adults in this study understood the consequences of premarital sexual activities, they lacked a supportive or enabling environment from society to prevent unplanned pregnancies and STIs. Hence, more efforts are needed to provide individual young adults in university settings the opportunity to seek SRH services without fear of social stigma.

6.5.2 Interpersonal Level

At the interpersonal (relationship) level, interactions with others, such as family members, and friends, including intimate partners, can provide social support or create barriers to healthy behaviours (Centers for Disease Control and Prevention, 2022; Rural Health Information Hub, 2022). In this study, participants reported that other people's judgemental attitudes and social stigma (gossip and jealousy) regarding their sexual activities outside of marriage were the primary deterrent to accessing SRH services in PNG. However, having a supportive partner and trusted friends enabled young adults to navigate difficult SRH circumstances.

6.5.2.1 Interaction with Family Members

Young adults attending universities in PNG reported receiving limited information to avoid unplanned pregnancy while growing up. Participants said that their parents found it difficult to discuss SRH issues with them as adolescent and young adult children because of the cultural settings and expectations. Some exception was encountered, with some educated parents in urban areas able to hold SRH dialogues with their children. This study did not explore the types of conversations between these parents and children, where and how they conversed, and the genders of the parents and children who were involved in the conversation. My lived experience and deep cultural knowledge suggest the conversation will usually be held among the same genders, for example, between a mother and her daughter. This view is consistent with Tommbe et al.'s (2019) finding that a family member of the same gender has an important role in sharing SRH information and providing specific SRH support in PNG.

Evidence suggests that parents-to-children dialogue about SRH can prevent the morbidity and mortality associated with sexual behaviours (Usonwu et al., 2021). However, as extensively reported in the scientific literature, there is a lack of dialogue on sexual and reproductive matters between parents/guardians and their children in PICTs because of cultural communication practices that restrict the open discussion of SRH topics between adults and young people (Baigry et al., 2023; Kelly-Hanku et al., 2023; Kennedy et al., 2013, 2014; Mitchell & Bell, 2020; Mitchell & Bennett, 2020a; O'Connor et al., 2019). In Fiji, parents have reported that it is culturally inappropriate to openly discuss SRH issues at home, and they feel apprehensive, embarrassed and ill-prepared to engage in such discussions (O'Connor et al., 2019). Indeed, the current study found that discussions at home with children were limited to preventing premarital sex and ensuring abstinence, mainly to avoiding premarital childbearing. Studies have shown that parents fear that discussing sex with their young children could lead them to engage in premarital sex and promiscuity later in life adulthood (Baigry et al., 2023; Kennedy et al., 2013; Mitchell & Bennett, 2020b; O'Connor et al., 2019). Consequently, sexually active young adults lack specific knowledge, such as using contraceptives and other negotiation skills to avoid unintended pregnancy and STIs (Baigry et al., 2023; Pichon et al., 2022).

The findings of this study are consistent with those of other studies that documented parent–child communication regarding SRH. For example, a recent study revealed the lack of parent–child SRH communication as one of the causes of the high rates of teenage pregnancies, unsafe abortions, school problems and other risky sexual behaviours in Ethiopia (Bekele et al., 2022). In addition, a systematic literature review about parent–adolescent communication in Sub-Saharan Africa found that a lack of parental self-efficacy and cultural and religious norms created an uncomfortable environment for SRH dialogue, which caused young people (adolescents) to seek SRH information from other sources (Usonwu et al., 2021). In contrast to these findings about the lack of parent–child SRH dialogue, some studies found that concerned mothers have held SRH dialogues with their daughters and provided advice and contraceptives (Baigry et al., 2023; Mitchell & Bell, 2020). A study about adolescent mothers in the Cook Islands reported that the mothers of some of these adolescents were supportive and offered family planning advice to their daughters (White et al., 2018a). In addition, in the context of Fiji, Mitchell and Bell (2020) revealed that a few young women described speaking with their mothers about sex and contraceptives, some of whom provided condoms to ensure their daughters practised safe sex.

Promoting parent-to-adolescent communication could help empower young adults to seek timely SRH services and prevent adverse SRH outcomes among students in late adolescence and young adulthood (Bhatta et al., 2021; Malango et al., 2022). In addition, quality communication could reduce the high rates of teenage pregnancies and other sexual risk behaviours and promote the adoption of safer sexual behaviours (Bekele et al., 2022; Usonwu et al., 2021). However, cultural communication barriers and a lack of appropriate SRH knowledge limit parents (Baigry et al., 2023; Malango et al., 2022; Wamoyi et al., 2010). Training is required on communication to ensure that SRH messages are channelled effectively. For instance, Tommbe et al.'s (2019) study that aimed to support women leaders navigate science, culture and religion for improved health outcomes in PNG showed that when parents were trained in cultural situated communication about SRH, they felt confident to speak openly with family members. In particular, mothers felt more comfortable speaking openly with their children and their husbands after participating in a leadership workshop on SRH that focused on communicating SRH messages.

6.5.2.2 Interactions with Friends and Peers

Friends and peers can play an emotionally supportive role or incite feelings of shame and embarrassment towards achieving good SRH (O'Connor et al., 2018). The findings from this study showed that the impact of interactions with friends and peers were twofold. First, the jealousy and gossip expressed by friends could create barriers to good SRH. Second, trusted friends can be emotionally and physically supportive and offer assistance and advice to their peers facing SRH issues, such as unintended pregnancy.

Young adults often fear their friends and fellow university students because of the prevalence of jealousy and gossip (Kelly-Hanku et al., 2023). Jealousy and gossip have created significant barriers to accessing SRH information and services and hinder sexually active young adults from freely expressing and enjoying their sexual lives (McMillan & Worth, 2011; Mitchell & Bell, 2020; O'Connor et al., 2019; L. M. Vallely et al., 2013). For young women in PNG, gossip about their having a sexual relationship has been shown to have jeopardised their chances of getting married, and in particular, reduces the bride price that potential husbands are willing to pay, which reduces their family's wealth (Kelly-Hanku et al., 2023; L. M. Vallely et al., 2013). Gossip is the unconstrained telling or repeating of stories or reports about other people that are not confirmed as true (Peters & Fonseca, 2020; Ullah et al., 2021). The present study's findings confirmed that gossip tarnishes a young women's integrity and pride. Young

adults commonly gossiped about a friend's or roommate's sexual activities, such as possessing condoms, accessing contraceptives, becoming pregnant and performing abortions. Overall, gossiping stems from jealousy that a girl, for example, is attractive, has more male sexual partners and engages in premarital sex. The act of gossip can be experienced as emotional abuse that affects another person's mental health and, consequently, their physical health.

Nevertheless, although some friends can act as barriers to good SRH, others provide valuable SRH information and emotional support. Factors such as the lack of parental self-efficacy, the lack of confidence in SRH knowledge and communication barriers prompt young people to rely on their friends and peers for SRH information and emotional support (O'Connor et al., 2019; Ram et al., 2020). A study on young people in higher learning institutions in Tanzania revealed that although the study participants regarded parents as trusted sources of SRH information, more than 60% of the 540 participants found it challenging to discuss SRH concerns with their parents, leading them to seek SRH information from their friends and peers (McHaro et al., 2021).

Similarly, the present study found that trusted friends supported each other emotionally during unintended pregnancies and after childbirth by providing contraceptive advice and ensuring their friends used hormonal contraceptives. A participant in this study ensured her friend had received a contraceptive implant before starting the second semester following childbirth owing to an unintended pregnancy. However, although peers served as important sources of SRH information and emotional comfort, some friends provided misleading information. This finding is consistent with those of a qualitative study conducted with young people in PNG, which explored how they talk about sex, sexual relationships and HIV (Kelly et al., 2010). In addition, in a study conducted by Nketia (2022), a participant reported that the contraceptive information she received from her friend discouraged her from using contraceptives. Thus, misleading information provided by peers reflects the individual level of SRH literacy (Nketia, 2022).

Considering that a young person's social development is significantly influenced by their friends and peers, peer education can play a crucial role in managing misleading information and ensuring the dissemination of accurate SRH information. A study that evaluated the impact of a peer-led intervention in Nigeria on young individuals aged 15–24 years found that peer education resulted in a positive shift in their knowledge, perspectives and opinions (Akuiyibo et al., 2021). Accordingly, continuous exposure to, and accessibility of, SRH information

through peer education can enhance comprehensive SRH knowledge, induce positive changes in opinions and promote positive SRH behaviours (Akuiyibo et al., 2021).

Furthermore, peer educators and friends play a crucial role in promoting protected sex among young, sexually experienced adults. For instance, Mitchell and Bell (2020) found that in Suva, Fiji, some sexually active young individuals felt uncomfortable accessing free condoms at STI clinics or purchasing them from retail outlets. Instead, they contacted their peer educators and friends to help them source condoms (Mitchell & Bell, 2020). Likewise, the findings from the present study showed that trusted friends were very supportive and provided emotional support and contraceptive advice to their peers. Although the specific role of peer support was not specifically explored in this study, the findings show that more research is needed to further understand the impact of peer educators and emotional support on the SRH of young people in PNG. Emotional barriers, such as shame, embarrassment and fear, are known to be major obstacles for young people seeking SRH services, and addressing these barriers through peer support or education could be a promising approach.

The act of being intoxicated and engaging in unprotected sex, which resulted in unintended pregnancy or the acquisition of STIs, meant some young adults found themselves at the centre of gossip, shame and embarrassment. Some participants in the study described unintended pregnancies or acquisition of STIs through alcohol consumption and transactional sex as consequences that young, educated adults brought on themselves. The use of alcohol through peer pressure occurred, while others were selling sex for goods or services. This finding is consistent with that of Khuzwayo and Taylor (2018), who described the socio-ecological level of sexual risk behaviours among youth in South Africa. Being intoxicated has led many young adults to participate in risky sexual behaviours (Khuzwayo & Taylor, 2018) and is a risk factor to good SRH.

6.5.2.3 Interaction with Intimate Partners

The findings of the present study suggest that in certain cases, male partners demonstrated their support by engaging in mutual understanding and decision-making with their female counterparts. However, in other instances, male partners are not as supportive and leave their female partners to shoulder the responsibility of pregnancy alone. Furthermore, in the context of committed relationships, male partners provide reciprocal support to their female counterparts and assume complete responsibility for any potential pregnancies that may arise.

For example, in the present study, male participants strongly argued that should their female intimate partner become pregnant, they would be happy to be a man and shoulder the responsibility of informing the parents of their partner. The parents of female students have stricter expectations of females than of males, as regards engaging in a sexual relationship. In contrast, women who became pregnant during casual sex or selling of sex may not have the same experiences as those in steady mutual understanding relationships. At the most, young women who are pregnant owing to casual sex and/or selling sex are the ones who are left to manage their pregnancies alone.

Overall, young female university students bear a disproportionate burden of premarital unplanned pregnancies compared with their male partners. This study showed that young women experience an emotional burden of shock, guilt and fear upon realising that they are pregnant. Moreover, the academic burden of being unable to keep up with assessment tasks and attending lectures because of hormonal and bodily changes leads to failing grades, academic suspension and possible exclusion from the academic program. This study also revealed that young women who experience morning sickness during the first trimester of pregnancy often fail and are placed on academic suspension while the male partner progresses on to another academic year and graduates ahead of the female partner. Furthermore, this study found that young women who face the challenge of unplanned pregnancies obtain abortion pills sold at pharmacy outlets and terminate preterm pregnancies. This is consistent with evidence from an earlier study about hospital admission following heavy post-abortion bleeding among young women (L. M. Vallely et al., 2014).

The findings of the current study provide evidence that the lack of specific contraceptive knowledge and the limited use of condoms, including a limited understanding of the female menstrual cycle among male participants, may be some of the many causes for university students in PNG experiencing unintended pregnancies. Increased awareness of the normal function of the reproductive system could be achieved by including the cycle when teaching the anatomy of the male and female reproductive systems. Understanding the female reproductive system can help a male support his female partner’s sexual and reproductive choices (Ellis & Davis, 2017), especially understanding the significance of using a condom during his partner’s unsafe days of her menstrual cycle. Furthermore, young couples could use reproductive knowledge to their advantage by planning when to have a child, delaying pregnancies and choosing to have unprotected sex during the safer days of the menstrual cycle.

The findings of this study are consistent with those of two past studies conducted in Fiji, which highlighted that gendered roles play a significant part in safer sex negotiation and pregnancy responsibilities in premarital relationships (Mitchell & Bell, 2020; Mitchell & Bennett, 2020a, 2020b). Mitchell and Bell (2020) provided evidence that in a committed sexual relationship, condoms are often deemed unnecessary. The non-use of condoms has come to symbolise trust. In contrast, others opt for condomless intercourse because of reduced sensation, thus leading to events of unintended pregnancy or acquisition of some STIs. Although it is difficult to pinpoint in covert sexual activities among unmarried university students in this study, the participants' narratives suggest that coercive control is a contributing factor to some of the unplanned pregnancies and abandonment experiences of female university students. Participants described experiences of manipulative control resulting in pregnancies as the fault of the female students for allowing themselves to be engaged in sex.

Consistent with the findings of studies on countries in the Pacific region (Kelly-Hanku, Weikum et al., 2020; Mitchell & Bell, 2020; Mitchell & Bennett, 2020a, 2020b), Khuzwayo and Taylor (2018) revealed that in South Africa, the need to gain or prove one's partner's trust and sexual satisfaction were the reasons young women participated in unprotected and unsafe sex. Young men in South Africa were instrumental in encouraging their partners to discontinue injectable contraceptives, arguing that these injectable contraceptives led to unpleasant sexual experiences (Khuzwayo & Taylor, 2018). In Senegal, husbands and intimate sexual partners have more autonomy over a woman's SRH (Sougou et al., 2020). In India, young women lack the autonomy to decide and control contraceptive use, pregnancy and childbearing, as seen in the low rate of modern contraceptive use (Tomar et al., 2020). These findings indicate that young females lack control over SRH decisions, then do their male intimate partners.

Significantly, improving women's autonomy in decision-making for SRH could reduce unintended pregnancies and STIs (Sougou et al., 2020). Women's empowerment could be achieved through SRH knowledge, formal education, and subsequent changes in social status. (Sougou et al., 2020). However, in PNG, the probability of women's empowerment through formal education is proportional to the level of intimate partner or spousal violence. As reported in the PNG Demographic and Health Survey 2016-18 (National Statistical Office, 2019), spousal violence is 18% higher for women with higher education than those without formal education. A wife's or woman's additional education possibly provides her with a greater range of choices and increased opportunity to act upon those choices (Redman-MacLaren & Mills,

2015) and, thus, threatens traditional male dominance and provokes men to subjugate women through violence (Mambon, 2023). Educated women in PNG, including young adult women in universities, can only exercise their power of choices in the context of safety and a safe environment.

6.5.3 Institutional Level

Institutions' rules, regulations, policies, and informal structures significantly constrain or promote people's SRH knowledge, perceptions, and health-seeking behaviours. This study's findings indicate that fewer university students accessed SRH services, including campus healthcare clinics, for sexual and reproductive needs. Students' fear of being reported to the university authority for disciplinary actions was a major factor that made them avoid campus healthcare clinics. University student services manage the healthcare clinics, and healthcare providers could easily report students for disciplinary actions, such as suspension from their university, if they are found to be pregnant or if they present with STIs. The findings also showed that the fear of being seen at healthcare facilities was the reason that participants arranged meetings to obtain STI medication and condoms outside of the healthcare providers' official working hours at the hospitals or healthcare clinics.

6.5.3.1 University Policy, Rules and Informal Structure

Young adults in this study expressed the need for greater structural support at the institutional level to ensure safe, easy access to SRH clinics because of the lack of such resources. The finding from this study also revealed that female students either terminate their unintended pregnancies or keep the pregnancy and face disciplinary actions from the universities. Cumulative emotional stress, pressure, and the shame and guilt of having an unplanned pregnancy have negatively affected young adults' academic performance and social status. To avoid humiliation, university disciplinary actions and unpreparedness for childbearing, young couples and/or women sometimes opt to end the unplanned pregnancy through unsafe abortion. L.M. Vallely et al. (2014) reported cases of female hospital admission because of heavy post-abortion bleeding. Among those women admitted were young female tertiary education students.

As evidenced by the literature, young adulthood is a state of sexual curiosity and experimentation because of normal biological changes and the growth of the human body (Cassidy et al., 2018; The Society for Adolescent Health and Medicine, 2017). The production

of sexual hormones (testosterone and oestrogen) increases, prompting men and women to engage in sex for procreation. Despite this scientific fact of human body development, universities and other higher learning institutions in PNG have neglected to provide SRH services to enable students to avoid the negative consequences associated with unintended pregnancies and STIs. When prompted to elaborate on the types of SRH support provided by universities, the majority of this study's participants stated that wardens, also known as the dean of men/women, held talks with the students only when an unexpected event, such as finding a deformed body of an aborted baby, occurs on the campus. There were no formal or established channels of SRH communication and care for the sexual health and wellbeing of university students reported as available on university campuses.

The lack of provision of SRH services within university campuses further reduces university students' timely access to SRH services, such as emergency contraceptive pills that will assist young couples to avoid unplanned pregnancies. Furthermore, an accessible SRH service would allow for curable STIs to be detected and treated promptly to avoid the further spread and subsequent negative outcomes of untreated STIs. In PNG, curable STIs are detected at primary healthcare clinics through history, signs and symptoms (National Department of Health, 2016). Moreover, pregnancy symptoms and the strong unpleasant smell of some STIs (chlamydia, gonorrhoea and trichomoniasis) have deterred students from attending lectures and other academic activities, resulting in their failure to obtain passing grades, placement on exclusion lists and possible termination from university studies.

6.5.3.2 Healthcare Service Rules and Regulation, and Interactions with Healthcare Providers

The attitudes of healthcare providers can either facilitate or impede individuals from accessing quality primary healthcare services (Malarcher & WHO, 2010). This study found that fewer university students have visited SRH services in PNG solely because of the emotional barriers of shame and fear of being reported. Research on Pacific communities has also shown that some healthcare providers in smaller communities were the ones who orchestrated gossip about young unmarried people's visits to family planning clinics for contraceptives and sexual-health-related problems (O'Connor et al., 2019)

The power imbalance between healthcare providers and young adults contributes to these emotional barriers experienced by the young adults in this study and elsewhere (Kennedy et al., 2013; Raman et al., 2015; White et al., 2018b). As noted in the *Social Determinants of*

Sexual and Reproductive Health report, clients accessing SRH services often feel embarrassed, anxious or socially vulnerable, particularly when they are required to undress and have their genitalia examined, leading to shame if privacy is not ensured or if the provider is of the opposite gender (Malarcher & WHO, 2010). However, as described by young people in Vanuatu, Solomon Islands and PNG, the provision of SRH services by non-judgemental and kind healthcare providers may contribute to an increased uptake of these services (Baigry et al., 2023; Harrington et al., 2021; Kelly-Hanku et al., 2023; Kennedy et al., 2013, 2014).

The findings from this study are consistent with those of other studies that documented health services as a contributor to young people's barriers and enablers to accessing SRH. Young unmarried adults' fear of being scolded or lectured in front of other people by nurses at healthcare clinics is among the main reasons that they avoid seeking contraceptives, including condoms or family planning advice, at SRH services (Baigry et al., 2023). In South Africa, young people avoid using SRH services because of the fear of being reported by nurses (Khuzwayo & Taylor, 2018). Further, some nurses' moral stances made them share limited SRH information with young unmarried men, which young men described as contributing to them making poor decisions regarding safer sex (Khuzwayo & Taylor, 2018). Similarly, a study of high school students' utilisation of SRH in Malaysia found that many adolescent and young adult students avoid SRH services because of embarrassment, the lack of confidentiality and the unfriendly attitudes of healthcare providers (Othman et al., 2019).

Several strategies can be implemented to address the issue of judgmental attitudes among healthcare providers in the context of adolescent and youth SRH services. First, extensive evidence shows that peer-led SRH education has successfully promoted positive health-seeking behaviours among adolescents and youths (Akuiyibo et al., 2021; Koren & Marchburn, 2022; McHaro et al., 2021). A report from the Pacific Community (2024) highlights an initiative by the Tuvalu Ministry of Health, which PNG could adopt to address the stigmatisation encountered by young people. The Tuvalu Ministry of Health, in collaboration with its partners, recruited twenty-five young people from various community groups, churches, and sports associations and provided them with comprehensive training as peer educators. These trained peer educators then visited primary, secondary and vocational schools to raise students' awareness of SRH rights, communication skills and referral pathways for SRH services (Pacific Community, 2024).

Second, adolescent and youth SRH services should be delivered by healthcare providers who can better understand and relate to the needs of young people. The literature in the Pacific indicates that young people preferred healthcare providers who are kind and compassionate toward their SRH concerns (Kennedy et al., 2013, 2014, White et al., 2018; Harrington et al., 2021). Thus, the current health workforce in PNG and other PICTs should receive ongoing training and resources. This will ensure that they possess the knowledge and skills necessary to communicate with empathy and provide nonjudgmental, youth-friendly care, contributing to the achievement of universal health coverage (WHO, 2024).

6.5.4 Community Level

At the community level, formal or informal social norms among individuals, groups or organisations can influence healthy behaviours, limiting or enhancing them (Centers for Disease Control and Prevention, 2022). The findings of the present study revealed that sociocultural norms and the Christian faith have shaped unmarried young adults' sexual behaviour into being secretive within community settings. Sexually active unmarried young people who did not wish to appear to have violated family values have kept their sexual relationship hidden from public view because family values and expectations in line with the Christian faith demand that young adults, including adolescents, avoid premarital pregnancies. This study found that despite their desire to avoid unplanned pregnancies, unmarried young university students were not adequately prepared or informed about how to prevent pregnancies and STIs. Instead, they become the centres of negative attention when their normal bodily changes (puberty) urge them to engage in sexual relationships and become sexually active.

6.5.4.1 Collective Conservative Societies and Risky Sexual Behaviour

In some conservative Melanesian societies, young people are not given enough education to empower them to make informed decisions about their sexuality and relationships. Therefore, those who grow up in these strict collective and conservative communities may not know how to practice safe sex when the opportunity to have sex arises. These young people may be the ones who have experienced teenage pregnancies, unsafe abortion or childbearing and/or STIs while attending universities and other tertiary institutions. For instance, this study revealed that some young female students were too ashamed to use contraceptives, such as a condom, because they did not know about the different types of contraceptives. This lack of contraceptive knowledge, especially of the use of condoms, may result from a lack of

comprehensive sex education. Furthermore, the current study found that cultural norms and expectations made it challenging for parents to discuss sex and reproduction with their teenage and young adult children. Traditionally, rites of passage ceremonies were the avenues for education on sex, pregnancy and child rearing (Manineng et al., 2017; Maulingin-Gumbaketi et al., 2021). However, the decline of these traditional ceremonies owing to the modern education system has led to reduced SRH education in these communities.

The findings of this study are consistent with those of other studies that showed that covert sexual activities place young people at detrimental SRH consequences. For instance, young adults raised in strict cultural and religious practices have some of the worst SRH outcomes. In Nepal, where Buddhism restricts premarital sex, sexual intercourse with multiple sex partners and the inconsistent use of condoms was reported as common among students aged 20 years and above (Regmi, van Teijlingen et al., 2010; R. Shrestha et al., 2016; R. M. Shrestha et al., 2013). Similar findings were reported about the Islamic faith in Indonesia (Berliana et al., 2018; O'Donnell et al., 2020). In other conservative cultures, such as Nigeria and Uganda, risky sexual behaviours were prevalent among young university students (Kaggwa et al., 2022; Omisore et al., 2022).

One way to overcome young adults' risky sexual behaviours is through community-sanctioned sex education. Sex education is a curriculum-based process that aims to teach children and young people about the cognitive, emotional, physical and social aspects of sexuality (United Nations Educational, Scientific and Cultural Organization, 2023). The goal is to provide age appropriate knowledge, skills, attitudes and values that empower children, adolescents and young adults to lead healthy, dignified lives (WHO, 2023a). Sexuality education should start at home with parent–child communication. Parent–child dialogue about SRH likely prevents the morbidity and mortality associated with sexual behaviours (Usonwu et al., 2021). Moreover, children and adolescents want to learn about sex matters from their parents (Turnbull et al., 2008; Usonwu et al., 2021). However, some parents are not prepared to hold SRH dialogue with their children because of the cultural barriers regarding sex and sexuality.

6.5.4.2 Cultural Communication Barriers Restrict Sex Education

In PICTs, cultural communication barriers restrict the provision of sex education by adults to young people (Mitchell & Bell, 2020). Parents fear that providing sexuality education to children and young people could lead them to engage in premarital sex and promiscuity in

adulthood (Baigry et al., 2023). Furthermore, a study that explored how adolescents' emotional experiences drive their sexual practices and health-seeking behaviours in Fiji found that a cultural perception of premarital sex as taboo and wrong was a reason for the absence of communication between parents and children regarding sexual health and relationships (O'Connor et al., 2019).

6.5.4.3. Way forward

A constructive approach to addressing the challenges faced by young adults in the community is to raise awareness about the importance of SRH rights (United Nations Population Fund, 2021). This study provides evidence for enhanced structural support, particularly for young women, as societal expectations often overlook their SRH rights (Chetty & Faleatua, 2015). Structural support can take various forms, including physical infrastructure, such as safe houses for young women facing intimate partner violence or sexual harassment, as well as emotional support (Nanyonjo, 2022).

To provide effective emotional support, parents, community leaders, and religious and cultural leaders must become more aware of the consequences of neglecting SRH rights for young women in PNG. The ongoing disregard for these rights has led to significant social issues affecting young women, such as verbal or physical abuse and harassment. In PNG, society has become pretentious to the sexual violence and harassment perpetrated against women and girls (Awayang, 2022). Adolescent girls and young adult women cannot walk freely on the streets without being abused or harassed either verbally or physically by bystanders or thugs (Awayang, 2022). Sexual violence against women and girls is not only a cause of injury and humiliation but also a major inhibitor of women's participation in public life (Douglas, 2007).

Engaging parents, community leaders, and figures from religious, cultural, and political spheres in conversations about the importance of SRH rights for young women can significantly enhance their understanding and appreciation of these essential rights. This can lead to constructive dialogues and collaborative actions to tackle sexual violence, harassment and stigma against women, creating a safer and healthier environment for young women. Young women and girls need a secure, safer environment to report issues of sexual violence and seek help from relevant authorities (Awayang, 2022).

6.5.5 Public Policy Level

Public policy factors include local, state and federal policies and laws that regulate or support health actions and practices for disease prevention, early detection, control and management (Centers for Disease Control and Prevention, 2022; Rural Health Information Hub, 2022). The findings from this study indicate that some strategies intended to achieve Objectives 3 and 5 of PNG's National SRH policy were insufficiently implemented. Objective 3 focuses on reducing the incidence and spread of STIs (NDoH, 2013). Objective 5 prioritises providing all individuals, irrespective of sexual orientation, with respectful SRH services. To achieve these objectives, the policy statement emphasised developing a gender-sensitive national standard of care that prioritises male involvement in SRH and improving access to comprehensive information and services related to STIs while providing competency-based training to healthcare workers for managing these infections (NDoH, 2013).

6.5.5.1 Insufficient Implementation of PNG National Sexual Reproductive Policy

The current study found that only a few university students have accessed SRH services for family planning advice, contraceptives and STI diagnosis and treatments, and these were mostly offered off campus. For those participants who sought SRH services, private arrangements were made with healthcare providers to obtain condoms and STI medication. Proper laboratory diagnosis of STIs was not established when private arrangements outside of healthcare facilities were made. In PNG, this practice of the exchange of SRH service between a client and a healthcare provider outside of healthcare facilities was described as social currency (Tynan et al., 2014).

The need for SRH services (for vulnerable people, such as unmarried young men) creates an opportunity for unauthorised healthcare practices to become institutionalised, complicating policy strategies in PNG (Tynan et al., 2014). Many young adults in tertiary education institutions have ventured into engaging in behaviours that increase their risk of negative sexual health outcomes that may jeopardise their SRH and wellbeing (Cassidy et al., 2018). Hence, young university students in the present study have called for greater structural support, such as incorporating friendly SRH facilities with their existing healthcare clinics on each university campus for safe and easy access whenever they have SRH needs.

This urgent call for greater structural support by the current study's participants was genuine, given that the quantitative results indicated that students residing on university campuses are

less likely to access SRH services offered outside of university campuses than those living off campuses. Therefore, it is urgent to update the SRH policy statements to guide the development of youth-friendly SRH clinics to accommodate young adults on university campuses and other youth-friendly environments.

The evidence on the insufficient implementation of SRH policies in this study is consistent with that of similar studies conducted in other PICTs. In Fiji, a study that explored youth sexuality and sexual risk among university *iTaukei* (Indigenous) female students found that an SRH policy that targeted youths adopted a biomedical and individual behaviour change approach and failed to correspond with sociocultural norms, gendered roles and economic factors that shaped individual choices (Mitchell & Bennett, 2020b). Thus, the biomedical and behaviour change approach of abstinence, being faithful to one sexual partner and using condoms (i.e. the ABC approach) had limited success in the Pacific region (Mitchell & Bennett, 2020b). In Tonga, the biomedical and behaviour change approach, especially the use of condoms, was insufficiently implemented among youths mainly because they did not want to be viewed as dishonouring sociocultural expectations regarding premarital sexual activities. Upholding sociocultural expectations means social status and identity in Tongan culture. Consequently, young people wanting to use condoms were concerned about their privacy and avoided open displays of sexual behaviour, such as owning condoms (McMillan & Worth, 2011).

As regards countries outside the Pacific region, the insufficient implementation of SRH policies has also been reported by studies on several African countries. A systematic literature review that aimed at synthesising evidence on the implementation of youth-friendly health services in Sub-Saharan Africa found that these services were mostly delivered within the context of a health facility or clinic setting. Providing such services within existing hospital or clinic settings may be beneficial. However, their location and the access points to such services are significant barriers that deny safe, easy access to young adults, who face financial burdens owing to the travel cost involved or are geographically isolated in rural communities (Bylund et al., 2020; Obiezu-Umeh et al., 2021). Given this scenario, Obiezu-Umeh et al. (2021) highlighted the need to design robust studies in order to gain a more comprehensive understanding about the types and combinations of implementation strategies that can be used to enhance the implementation of youth-friendly health service interventions effectively and the context in which these strategies can be used.

Drawing from the findings of the studies conducted in Sub-Saharan African countries, recommendations to design robust studies to better understand policy implementation strategies can be applied in PNG. The country is also constrained by its limited healthcare resources, including the workforce, and sociocultural expectations, especially the avoidance of premarital sex, a situation that is similar to that in some Sub-Saharan African countries. Thus, PNG needs evidence to create and direct policy implementation strategies. The current study has provided evidence that youth-friendly SRH services must be available in an environment in which most young adults congregate, to ensure they have safe and easy access to these services, despite the many factors that challenge policy implementation. The successful story of Kenya becoming an exemplar in delivering family services when it exceeded its 2020 target of 58% modern contraceptive use by married women was made possible by its government's political will. Its government has supported family planning services financially since the setting of the 2020 target in 2012 (Exemplars in Global Health, 2023).

Likewise, PNG needs political will, continuous government financing and ongoing monitoring of the health workforce in order to significantly reduce STI prevalence and unplanned pregnancies, if the government is serious about lifting most young adults out of poverty. Since the last systematic review on the prevalence of STIs in PNG (A. Vallely et al., 2010), factors sensitive to cultural, social and economic contexts have not been considered in implementing SRH policies. This may be the reason for the lack of context-specific health service provision for the different cohorts of sexually active people, such as unmarried young people or the key population in PNG. An integrated biobehavioural survey in PNG, *Kauntim mi tu* (Count me too) has provided significant knowledge about the SRH needs and practices of female and male sex workers and transgender communities, which plays a valuable role in enhancing HIV and other STI prevention and treatment programs for these population groups (Kelly-Hanku, Redman-MacLaren et al., 2020; Kelly-Hanku, Weikum et al., 2020; Weikum et al., 2022). Therefore, further research is needed to establish strategies that can influence the lives of young, educated individuals regarded as the potential future workforce for PNG. This study has provided evidence of consumers' (young adults) perspective.

6.5.5.2 Reasons for Insufficient Implementation of National Sexual Reproductive Policy

PNG's SRH policy implementation is stagnant for many reasons. One key reason is the weak government structures and systems that are currently in place. For example, Objective 5 of the National PNG SRH policy seeks to promote the respectful provision of SRH services to all

individuals (NDoH, 2013). However, the tangible infrastructure and human resources to deliver these healthcare services are lacking in places where young people congregate. Therefore, there is an urgent need to update the policy statements, considering the changes that have occurred following the restructuring of the healthcare system. Youth-friendly SRH clinics should be constructed within the settings that accommodate young adults, such as university campuses and tertiary colleges. For instance, in PNG, tertiary institutions have on-campus healthcare clinics; however, the provision of SRH services is lacking.

6.5.5.3 Papua New Guinea Needs National Alcohol Policy

Last, PNG needs a comprehensive national alcohol policy system to promote healthy decision-making and limited/no use of alcohol and to tighten the access to, and thus consumption of, alcohol by minors. Alcohol is promoted with appealing packaging resembling soft drinks, leading to increased focus and spending on alcohol among the youth rather than pursuing positive life goals. The uncontrolled consumption of alcohol by minors and young adults places them at increased risk of risky sex, as reported by participants in this study and other published studies (Cho & Yang, 2023). It also affects families and communities throughout PNG, with authorities in hospitals reporting rising cases of violence, trauma, sexual abuse and rapes attributed to alcohol consumption.

6.6 Ensuring Quality of Research Findings

The assessment of research quality is crucial to ensure that findings are valid and trustworthy and are effectively applied in practice or integrated into healthcare delivery (Noble & Smith, 2015). This study was conducted using a mixed methods research design. Therefore, applying quality indicators for either quantitative or qualitative research alone would not fully capture the extent of rigour in mixed methods research (Fàbregues & Molina-Azorín, 2017). Instead, the quality measures for mixed methods suggested by Leko et al. (2022) are used to confirm the quality of this study. The terms *integration, synergy* and *component design* (Leko et al., 2022) are applied and examined to demonstrate that the study findings are valid and trustworthy.

6.6.1 Integration

In mixed methods research, qualitative and qualitative research methods and data are integrated, which distinguishes it from multi-methods research (Leko et al., 2022). In this

explanatory sequential mixed methods study, I conducted the first integration after I analysed the quantitative data, and the results informed the theme and description of the characters I wrote about in the short story I used as the interview guide during storytelling (see Section 3.6). I conducted the second integration after I transcribed and analysed the interview data (see Section 3.8). I compiled the survey results and interview findings and made sense of the data through a visual representation.

6.6.2 Synergy

Synergy refers to the interaction of two or more things working together, resulting in a whole that is greater than the sum of its parts (Leko et al., 2022). In this study, a culturally appropriate methodology, as described in Sections 3.2–3.5, was employed to facilitate the understanding and explanation of young adults' perceptions and practices of accessing and using SRH information and services. Although prior studies on PNG (Kelly et al., 2010) have utilised single-case designs such as focus group discussions in documenting the SRH of young people (including adolescents), it was deemed culturally inappropriate for me as an adult Indigenous woman (a PhD candidate) to conduct interviews about the sexual experiences of unmarried young adults in PNG without a suitable platform to initiate the conversation. Hence, the explanatory sequential mixed methods design was appropriate, for it allowed me to collect baseline quantitative data from the study participants through a self-administered questionnaire, thus ensuring their safety as they shared their sexual experiences and stories. The qualitative follow-up phase then provided the anonymous participants with the opportunity to explain, clarify and expand upon the quantitative data.

Moreover, my experience as research assistant in the first-ever study undertaken on the acceptability of male circumcision for HIV prevention at two faith-based universities in PNG (MacLaren et al., 2013) guided my judgement to employ the explanatory sequential mixed methods design. The male circumcision study demonstrated that it is possible to conduct sensitive sexual health research among students at faith-based universities in PNG by tapping into the country's established social and cultural structures through a gendered research process.

6.6.3 Component Design

Quantitative data were collected using a descriptive cross-sectional survey (see Section 3.6). A descriptive cross-sectional survey collects information about a particular health-related

problem (e.g. in this study, SRH knowledge and perceptions, and health-seeking behaviours) and other variables in a defined population at a particular time. Information is collected only once from the study participants because the data are used for descriptive purposes and not for comparisons (Buttner & Muller, 2015). Hence, larger sample sizes are not required in quantitative description surveys to make inferences; however, a greater sample size is desirable to reduce sampling errors (Buttner & Muller, 2015). The minimal sample size required for the quantitative phase of data collection was 96 (for the sample size calculation, see Section 3.5.2); however, more than 270 respondents attempted the survey; after cleaning the survey data, 52 responses were eliminated because of invalid responses. Only 228 responses were valid for statistical analysis. In addition, data were collected using a validated questionnaire designed by the WHO for researchers to modify and collect context-specific SRH information from young people (see Section 3.5.1).

Qualitative data were collected through anonymous one-on-one telephone interviews using a storytelling approach (see Section 3.7). Purposive sampling was applied in participant recruitment to optimise answers to my research question. As an insider researcher, I understood the SRH communication barriers; thus, maintaining the anonymity of the participants was highly significant to enable them to share their views, opinions and explanations meaningfully. Thus, participants provided pseudonyms instead of their true names. All interview data were transcribed verbatim, and expressions used in Tok Pisin (PNG's lingua franca) were analysed and translated before coding to ensure that participants' voices were maintained throughout the data analysis.

6.7 Study Strengths and Limitations

This study has strengths and limitations. I begin with the strengths:

- I had a skilled supervisor who had specific experience in conducting SRH research in the PNG context. I also had supervisory support from skilled researchers with epidemiology and biostatistics expertise and from qualitative researchers with methodological and methods expertise.
- Because of my strong advisory team, I published my literature review and collected and analysed quantitative and qualitative data during the COVID-19 pandemic. I analysed the data using different analytical tools, such as SPSS and NVivo, and applied the thematic and framework analyses approaches to analyse data.

- A validated survey tool specific to my research question was used to collect quantitative data (Cleland, 2001).
- As a female insider researcher, I understood the cultural challenges of conducting SRH interviews with unmarried young people. Thus, the explanatory sequential mixed methods study design enabled me (a full-time PhD candidate) to collect sensitive SRH information in a culturally appropriate manner without requiring an additional research team in PNG.

Although the explanatory sequential mixed methods design is straightforward, I faced the following challenges regarding the time I took to conduct this study.

- I was unable to obtain ethics approval in time for the initial data collection phase. This delay resulted in the loss of a significant portion of my candidature time.
- I was unable to obtain just one ethics approval for all studies together because the protocol for qualitative data collection was not always finalised at the beginning of this research.
- Qualitative data were collected using telephone interviews; thus, it was impossible to capture the non-verbal expression of the interviewees.
- Because of the COVID-19 pandemic, I had to change my data collection methods and use convenience sampling instead of probability sampling to recruit survey respondents.
- Member-checking processes, also known as respondent validation, which is a technique for exploring the credibility of results, were not used. This methodological principle ensures the voices of marginalised and oppressed groups are presented accurately as heard (Birt et al., 2016).
- This study focused solely on the male/female gender and did not address the SRH needs and challenges of LGBTQI+ young people in PNG.

6.8 Recommendations for action

- Public Policy Level

The Papua New Guinea National Department of Health and its stakeholders must take action to revise the current SRH Policy Statements. This revision is necessary to guide and support the establishment of youth-friendly SRH clinics in areas with high concentrations of young

adults to increase the uptake of SRH services. An example of an ideal location for such a clinic would be on university and college campuses.

- Community Level

To address the SRH challenges encountered by young adults in the communities, individuals in influential positions, such as healthcare providers and health education professionals (teachers/academics), must take action to increase SRH awareness using health promotion messages. Key people to target in the community are parents, church and community leaders, and young individuals who can play the role of peer mentors and train these key people to communicate SRH messages effectively. Young adults need greater emotional support and guidance from their community leaders and members to seek SRH services.

- Institutional Level

Universities must take action to create SRH policy statements that align with the National SRH policy. When formulating policy statements, universities must also take into consideration the broader gender issues present in PNG and ensure their policy statements for action include SRH rights for all young adults, with particular emphasis on supporting female students. This inclusive approach will empower female students to effectively navigate sexual health issues, thereby enhancing their ability to complete their university programs successfully. University policy must also prioritise the establishment of a user-friendly SRH environment that facilitates student counselling, provides contraceptives and offers STI treatments.

6.9 Recommendations for Future Research

- Research is needed to explore university administrators' and healthcare providers' views on the acceptability and feasibility of establishing friendly SRH services within university campuses. For instance, two of the six PNG universities are faith-based, with religious principles overseeing their operational policies.
- More research is needed to understand the drivers of unintended pregnancies experienced by tertiary (university) students in PNG. This study could not document experiences relating to intimate partner violence and instances of coercive control resulting in unintended pregnancies.
- Research is also needed to capture the SRH needs and challenges of LGBTQI+ young people in PNG. This study only documented the experiences of male and female young adults.

6.10 Conclusion

This study aimed to describe and understand factors that influence the SRH of young people in PNG and its relationship to their successful completion of tertiary (university) education. An explanatory sequential mixed methods study design was used to explore and understand university students' SRH knowledge and practices and analyse barriers to and enablers of university students' willingness to access SRH services, including the influence this may have on program (course) completion.

The study evidenced that the majority of young university students had engaged in sex and had multiple sexual partners. Many have acquired general knowledge about coitus, conception and pregnancies, including places where they can obtain modern contraceptives. However, they lacked accurate knowledge on the correct use of oral and emergency contraceptive pills and did not access SRH services. The lack of specific contraceptive knowledge and less use of SRH services is the result of personal, social, institutional and cultural barriers to abstaining from premarital sex.

It is clear from this study that young university students in PNG need government immediate action through the universities and healthcare system to address the primary barriers they face in maintaining their SRH if the PNG government is serious in achieving its Vision 2050 of being a healthy, wealthy and wise nation by 2050. A political will to reduce the negative consequences of unintended pregnancies, unsafe induced abortion and STI experienced by university students in PNG. Establishing structural facilitators such as changes to student pregnancy policies and providing user-friendly SRH clinics on university campuses may contribute to reducing stress associated with unintended pregnancies and STIs and enable students to remain more focused on academic performance, hence successful completion of their university programs.

6.11 Chapter Summary

In this chapter, I have:

- restated the purpose of this study,
- discussed the key findings of this thesis, using the SEM,

- provided a brief background of the SEM and showed how the interpretation of my key findings are better understood when examined in relation to existing literature about the intrapersonal, interpersonal, institutional, community and public policy levels,
- discussed the quality of this explanatory sequential mixed methods study to show that the steps taken and the underlying reasoning are valid and trustworthy, which indicates that the study findings are hence suitable for integration into health systems practice and
- provided recommendations for action and future research and a concluding statement.

In the next and final chapter of this thesis, I describe my journey of growth as a novice researcher to a changed individual who is confident in conducting and leading independent research.

Chapter 7: Reflection on My PhD Journey

In this concluding chapter, I reflect on my PhD journey and present the epilogue. I compare this journey with the stages of a butterfly's life cycle, which starts with an egg (Stage 1), which hatches into a caterpillar (Stage 2), that grows into a pupa (Stage 3) before metamorphosising into a butterfly.

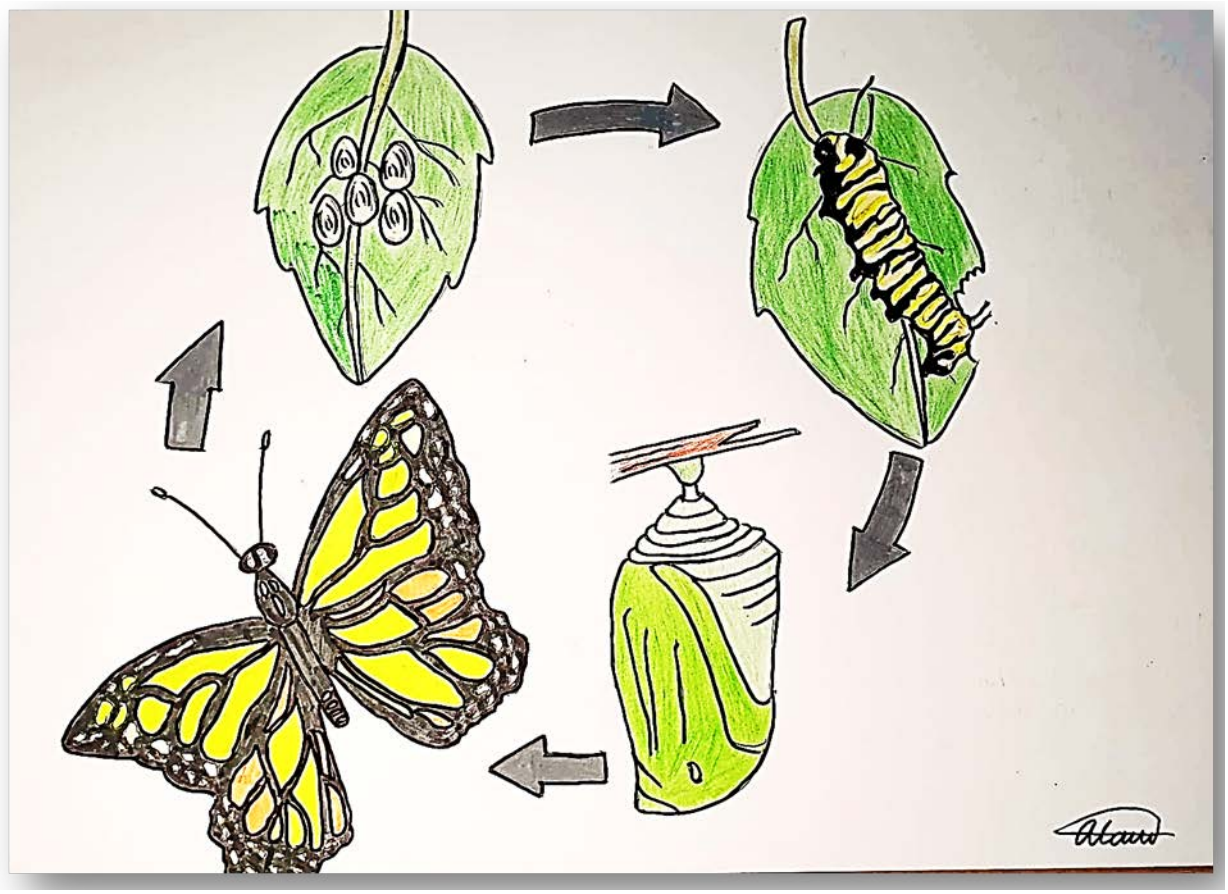

Figure 7.1: Butterfly life cycle (drawing by Cairer Morris Manineng)

Stage 1: Start of PhD Candidature (A butterfly's egg)

I started my candidature with many challenges and opportunities. One thing that stood out for me was the challenge of asking questions and seeking timely help. I was afraid of making mistakes. I recall that during a supervision meeting, my advisor advised me to develop a study protocol for conducting the scoping review. I did not understand the term 'study protocol', because I was familiar with the use of the word 'proposal'. Therefore, I left the meeting pondering what she had meant when she asked me to develop a study protocol. I questioned myself, 'What is a protocol anyway?' It took me a while to understand it, and I could have

saved time had I asked for clarification about, and examples of, study protocols during or after the meeting.

Stage 2: Post Confirmation of Candidature (The caterpillar)

After the confirmation of my candidature, I faced several challenges because of the COVID-19 pandemic. These challenges made me feel like a vulnerable caterpillar that had just hatched from the egg and was now exposed to a competing environment of prey and predators. As a full-time international student with three school-age children, I had to manage their homeschooling while pursuing my studies. The closure of international borders also affected my research, as I had to change my data collection methods from traditional face-to-face paper-based interviews to an online survey followed by telephone interviews. To conduct the online survey, I had to quickly learn how to use the Qualtrics software (the survey tool) and transfer all the questions into the software.

Since my study focused on young people in PNG—my home country—it was a requirement of JCU that I had to gain ethics approval from a PNG-based Human Ethics Committee, such as the PNG MRAC. Once it was obtained, the JCU Human Ethics Committee could consider and award reciprocal approval. It was understood that PNG MRAC would be more familiar with the ethics requirements for research conducted among young people in PNG. There were two important factors that affected the timely approval of my ethics application. First, I had difficulty finding PNG MRAC's ethics application template to submit my ethics application. Despite asking and sending emails, I could not obtain the template easily. After a long search, someone finally emailed me a PNG MRAC application template. I submitted my ethics application to PNG MRAC, but because of the enforcement of lockdowns following the COVID-19 pandemic in PNG, as in Australia and other countries, the PNG MRAC could not meet to review my study protocol. This delayed my progress with data collection by many months. In this period of added uncertainty, data collection delay, lockdowns and homeschooling, my progress was affected to the point where my PhD candidature was placed under review. I was informed that should I fail to complete certain major tasks related to my research, such as submitting my scoping review for publication, my candidature would be terminated. I worked hard and completed the task assigned. I believe that going through a review process helped me develop resilience.

I had initially felt that I was unfairly treated, given the uncertainty and mixed messages that were prevalent at the beginning of the COVID-19 pandemic. As an international student and a mother, I did not have any family members in Australia to rely on for help. It was a constant struggle to stay focused and maintain peace of mind while taking care of my three children and completing my work. In addition, obtaining ethics approval in a foreign country proved to be a significant challenge for me. All these factors made me feel vulnerable and afraid. However, the challenges I faced during the period after my confirmation of candidature through to the mid-candidature review helped me grow as a person and taught me to overcome my obstacles with patience and perseverance.

Stage 3: Pre-completion Milestone (The pupa)

I managed to collect all the data needed for this thesis, but I struggled with analysing and making sense of them. It would have been easier to work with one type of data, such as only quantitative data; however, I decided to work with quantitative and qualitative data to learn how to analyse and interpret the results. My real struggle was with the nuances surrounding the collection, sorting, analysis and interpretation of the qualitative data. As a novice researcher, I felt I did not have adequate knowledge to conduct a qualitative study despite having experience of conducting interviews and focus group discussions. Initially, I did not fully understand the reasoning, the process of keeping a memoir and the reflective approach required in collecting and analysing qualitative data. I came into this study with a very objectivist view. I am grateful I have a good advisory team with expertise in quantitative and qualitative data analysis.

Stage 4: A More Confident Person (A butterfly)

After going through the major milestones of conducting this mixed methods study, I feel more confident that I can independently plan and conduct a similarly designed study. I have gained numerous valuable insights through the continuous support of my supervisory team, the JCU Doctoral Cohort Program and the JCU student counselling service.

Epilogue

As I sit at my desk in Room 18 of the Faculty of Medicine and Health Sciences Building at DWU in Madang, PNG, I notice my first-year students walking past my office. Soft giggles and smiles fill the hallway as they make their way to the lecture room for the human biology lecture. I notice one of my students, who is visibly pregnant, making her way to the classroom

without any sign of discomfort or hesitation. It is good to see that the revised pregnancy policy has created a level of acceptance and inclusivity towards pregnant students. I am also pleased that a pregnant student and her partner can be allowed to continue attending classes to complete their current semester. They may then take a one-year leave of absence or resume classes if they provide evidence of their childcare arrangements. Overall, it feels good to witness the university's commitment to supporting its students through all stages of life. However, there are still many areas that need improvement, such as incorporating SRH services within the university clinic so that students can delay pregnancies and avoid STIs.

Appendices

Appendix 1: Structured Questionnaire

Section 1: Demographic and background information					
No.	**VARIABLE**	**QUESTION**		**RESPONSE OPTIONS**	**SKIP**
	In this section, I will ask you some questions about yourself, such as about your current tertiary institution, program, age and gender. Please read each question carefully and choose option 1, 2, 3, 4, 5, etc. as your answer. (Long dispela seksen, mi laik askim yu sampela question long save liklik long yu , kain olsem nem blong school bilong you, krismas blong yu na question olsem yu man or meri na ol narapela. Plis ridim gud question na jusim opsen olsem 1, 2, 3, 4, olsem ansa bilong yu.)				
1	INSTITUTION	What is the name of your current institution? (Wanem nem bilong university yu nau enrol long em?)			
2	YEAR LEVEL	What is your current year level? (Wanem yia leval bilong yu?)	1	Year 1 (Yia 1)	
			2	Year 2 (Yia 2)	
			3	Year 3 (Yia 3)	
			4	Year 4 (Yia 4)	
			5	Other (Narapela)	
3	PLACE OF RESIDENCE	Are you residing in the dormitory provided by your university? I mean living in another country like Australia. (Nau yet, yu silip long domitori bilong univesiti bilong yu or nogat?)	1	Yes	
			2	No	
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	
4	WHETHER LIVED OUTSIDE OF PNG	Have you lived outside of Papua New Guinea? (Yu bin stap autsait long Papua New Guinea or nogat?)	1	Yes	Go to 5
			2	No	Go to 6
5	DURATION LIVED OUTSIDE OF PNG	How long were you living outside of Papua New Guinea? (Hamas krismas yu stap autsait long Papua New Guinea?)	1	Less than 5 years	
			2	More than 5 years but less than 10	

			3	More than 10 years	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
6	AGE	How old were you at your last birthday? (Yu bin hamas krisma long laspela bondei blong yu?)	1	_____ years	
			2	Don't know (No save)	
			3	Refuse to answer (No laik long bekim)	
7	GENDER	What is your gender? (Yu man, meri, transgenda or narapla?)	1	Male (Man)	
			2	Female (Meri)	
			3	Transgender (Trensgenda)	
			4	Other (Narapela)	
8	CLINIC AT UNI CAMPUS	Does your university have a clinic on the campus? (Igat clinic insait long universiti bilong yu or nogat?)	1	Yes	
			2	No	
			3	Other (Narapela)	
9	RELIGION	What is your religion? (Wanem lotu bilong yu?)			
10	PROVINCE OF ORIGIN	What is your province of origin? (Yu bilong wanem provins?) If you are mixed parentage, select all that apply to you. (Sapos yu mix, selectim ol provins blong yu.)			

Section 2. Sexual and reproductive health knowledge					
No.	**VARIABLE**	**QUESTION**		**RESPONSE OPTIONS**	**SKIP**
	Now I want to ask you some questions on sex and reproduction. (Nau bai mi askim you sample question lon sait blong kuap na kamapim pikinini.)				
11	AWARENESS OF PREGNANCY AT FIRST SEX	Can a woman become pregnant on the very first time she has sexual intercourse? (Long namba wan taim blong wanpla meri long kuap, em ken kamapim pikinini too or nogat?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
12	BELIEF THAT PREGNANCY IS LIKELY TO OCCUR MID-CYCLE	Do you think a woman is most likely to become pregnant if she has sexual intercourse halfway between her menstrual cycle? (Taim wanpla meri em stap namel long ol sikmun saikel bilong em or day 14 na em kuap, yu ting em ken kamapim pikinini?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
13	KNOWLEDGE OF SAFE/UNSAFE DAYS	Have you heard about safe and unsafe days in a woman's menstrual cycle? (Yu bin harim liklik long ol sef na unsef days long ol mun blong ol meri tu?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
	Now I want to ask you some questions about contraception. I mean methods men and women use to avoid pregnancy when having sex. (Nau, mi laik askim yu sampela questen long sait blong abrusim pikinini long kamap. Mi min olsem ol ways man na meri save usim na pikinini inonap kamap long taim blong kuap.)				
14	AWARENESS OF CONTRACEPTION METHODS	Which methods of contraception have you heard of? Choose options that you know. (Wanem sampla way blong abrusim pikinini long kamap you gat save long em? Makim displa yu save long em.)	1	Pills	
			2	Injection (depo)	
			3	Condoms	
			4	Emergency contraceptive pills	
			5	Implants	
			6	Withdrawal	
			7	Rhythm method/ Periodic abstinence	
			8	Other (Narapela)	
			9	Refuse to answer (No laik long bekim)	
15	AWARENESS OF PILL AND SUPPLY	To avoid pregnancy, do women need to take the contraceptive pill every day? (Ol meri save kisim passim bel pill marasin olgeta dei?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
16		Do you know of any place where young people could obtain pills? (Yu save long sample hap we ol yangpla man meri ken kisim pill marasin?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
17	AWARENESS OF INJECTION AND SUPPLY	Do women have an injection every 2 or every 3 months? (Ol meri save kisim passim bel sut olgeta 2 or 3 mun or nogat?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
18		Do you know any place where young people could obtain injection? (Yu save long sampla hap we ol yangpla man meri ken kisim injection blong passim bell?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
19	AWARENESS OF CONDOMS AND SUPPLY	Do you know that a man can put a rubber device (condoms) on his penis before intercourse? (Yu save olsem wanpla man iken putim raba or gumi long kok blong em before long kuap?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
20	KNOWLEDGE OF CONDOMS	Are condoms effective in preventing pregnancy? (Condom or gumi ol gudpla long stopim pikinini long kamap or nogat?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
21	KNOWLEDGE OF WHERE TO OBTAIN CONDOMS	Do you know any place where young people can obtain condoms? (Yu save long sampla hap we ol yangpla man meri iken kisim condom or gumi?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
22	AWARENESS OF EMERGENCY CONTRACEPTIVE PILL AND SUPPLY	Can a woman take emergency contraceptive pills soon after intercourse? (Wanpla meri inap long kisim 'emegensi passim bell marasin' bihain stret long kuap?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
23	KNOWLEDGE OF EMERGENCY CONTPILLS	Do you know any place where young people can obtain emergency contraceptive pills? (Yu save long sampla hap we ol yangpla man meri inap long kisim emegensi passim bel marasin?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
24	MENSTRUAL CYCLE KNOWLEDGE SAFE/UNSAFE DAYS	Can a couple avoid sex on days when pregnancy is most likely to occur? (Tupla man meri ken abrusim kuap long taim we pikinini iken kamap or nogat?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
25	OPINION ON TYPES OF CONTRACEPTIVES FOR YOUNG PEOPLE	Which method of contraception do you think is most suitable for young people? (Wanem way blong passim bel em gudpla stret blong ol yangpla man meri?)	1	Pill	
			2	Injection (Depo)	
			3	Implants	
			5	Condoms	
			6	Emergency contraceptive pills	
			7	Rhythm/Period Abstinence	
			8	Other (Narapela)	
			9	Don't know (Mi no save)	
			10	Refuse to answer (No	

				laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
	In this section, I will ask you some questions on HIV/AIDS and sexually transmitted infections. (Long displa section, bai mi askim yu sampla question long HIV/AIDS and STI or ol sik blong kuap.)				
26	AWARENESS OF HIV/AIDS	Have you heard of HIV or AIDS? (Yu bin harim liklik long displa sik HIV or AIDS?)	1	Yes	
			2	No	
			3	Refuse to answer (No laik long bekim)	
27	BELIEF THAT IT IS POSSIBLE TO CURE AIDS	Is it possible to cure AIDS? (Inap long AIDS ipinis olgeta long bodi or nogat?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
28	BELIEF THAT CONDOMS REDUCE RISK OF HIV INFECTION	Are condoms effective in preventing HIV/AIDS? (Ol condom or gumi gudpla long banisim man meri long HIV/AIDS or nogat?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
29	AWARENESS OF STIs	Apart from HIV/AIDS, there are other diseases that men and women can catch by having sexual intercourse. Have you heard of any of these diseases? (Kain olsem HIV/AIDS, igat ol narapla sik ol man meri inap long kisim long taim blong kuap. Yu bin harim liklik long ol displa sik tu?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
30	KNOWLEDGE OF STI SYMPTOMS IN MEN	What are the signs and symptoms of a sexually transmitted infection (STI) in a man? You can choose more than one option.	1	Discharge from penis (Wara long kok)	

		(Wanem ol samthing iken sowim olsem man igat sik STI? Yu ken makim planti ansa.)	2	Pain during urination (Pain taim pispis)	
			3	Ulcer/sores in genital area (Sua arere long kok)	
			4	Don't know (Mi no save)	
			5	Other (Narapela)	
			6	Refuse to answer (No laik long bekim)	
31	KNOWLEDGE OF STI SYMPTOMS IN WOMEN	What are the signs and symptoms when a woman is infected with a sexually transmitted infection (STI)? (Wanem ol samthing iken sowim olsem meri igat sik STI?)	1	Vaginal discharge (Wara long kan)	
			2	Pain during urination (Pain taim pispis)	
			3	Ulcers/Sores in genital area (Sua arere long kan)	
			4	Don't know (Mi no save)	
			5	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
	I want to ask you some questions about condoms. (Long hia, mi laik askim yu sampla questen long kondom.)				
32	EVER SEEN A CONDOM	Have you ever seen a condom? (Yu bin lukim wanpla kondom or gumi bipo tu or nogat?)	1	Yes	
			2	No	
			3	Refuse to answer (No laik long bekim)	
33	AGREE THAT CONDOMS CAN SLIP OFF DURING SEX	Can condoms slip off the man and disappear inside the woman's body? (Inap long condom lus long man na igo hait olgeta insait long meri?)	1	Yes	
			3	No	
			4	I don't know (Mi no save)	
			5	Refuse to answer (No laik long bekim)	
34	AGREE THAT CONDOMS DO PREVENT STIs	Are condoms effective in protecting against sexually transmitted infections (STI)? (Ol condom inap long banisim ol man meri long sik STI or nogat?)	1	Yes	
			2	No	
			3	Other (Narapela)	
			4	Don't know (Mi no save)	
			5	Refuse to answer (No laik long bekim)	
35	AGREE THAT CONDOMS CAN BE USED MORE THAN ONCE	Can condoms be used more than once? (Inap long ol lain usim wanpla condom planti taim or nogat?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	

Section 3: Sexual conduct					
No.	**VARIABLE**	**QUESTION**		**RESPONSE OPTIONS**	**SKIP**
36	EVER EXPERIENCED SEXUAL INTERCOURSE	I want to make certain that I have the correct information. Have you ever had sexual intercourse in your whole life? (Mi laik luk save stret olsem mi kisim stretpla toktok. Yu bin kuap pinis or nogat olgeta, long taim yu liklik yet ikam inap nau?)	1	Yes	
			2	No	Go to 65
			3	Refuse to answer (No laik long bekim)	
37	LIFETIME NUMBER OF SEXUAL PARTNERS	In your whole life, how many people have you had sexual intercourse with? (Yu bin kuap wantaim hamaspla man or meri tru long taim yu liklik yet ikam inap now?)	1	____ # (man/woman)	
			2	Refuse to answer (No laik long bekim)	
38	AGE AT FIRST INTERCOURSE	How old were you when you first had sex? (Yu bin hamas krismas tru long festaim yu kuap?)	1	_____ years old	
			2	Can't remember (Mi nonap tingim)	
			3	Refuse to answer (No laik long bekim)	
39	COERCIVE SEX	Some young people are forced to have sexual intercourse against their will by a stranger, a relative or an older person. Has this happened to you? (Sampla yangpla man meri ino save laik kuap tasol ol narapla lain, ol family memba or ol bigpla lain save fos long kuap. Displa ibin kamap long yu tu or nogat?)	1	Yes	
			2	No	Go to 40
			3	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
40	NUMBER OF COERCIVE PARTNERS	How many different strangers, relatives or older persons have forced you to have sex against your will? (Hamaspla ol narapla lain, family memba or bigpla lain ibin fosim yu long kuap taim yu no laik?)	1	# _____	
			2	None	
			3	Refuse to answer (No laik long bekim)	
41	RECENCY OF LAST INTERCOURSE	How long ago did you last have intercourse with a man/woman? (Hamas taim igo pinis em last taim yu kuap wantaim wanpla man or meri?)	1	_____week ago	
			2	_____ months ago	
			3	Refuse to answer (No laik long bekim)	
42	NUMBER OF COITAL ACTS	How many times did you have full intercourse? I mean having sexual penetration. (Hamas taim yu bin kuap tru wantaim wanpla man or meri?)	1	# ---------- times	
			2	Once only (Wanpla taim tasol)	
			3	Refuse to answer (No laik long bekim)	
43	REGULARITY OF CONTRACEPTIVE USE	Apart from the first time, did you ever use a method to avoid pregnancy? (Long olgeta taim yu kuap, yu bin usim sampla wei long stopim pinikini long kamap tu or nogat?)	1	Always (Olgeta taim)	
			2	Sometimes (Sampla taim)	
			3	Never (nogat tru)	
			4	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
44	USUAL CONTRACEPTIVE METHODS	What method of contraceptives did you mostly use? You can choose more than one answer. (Wanem wei em main wei yu usim long abrusim pikinini long kamap long taim yu kuap?)	1	Condoms	
			2	Pill	
			3	Injection	
			4	Implant	
			5	Rhythm method	
			6	Other (Narapela)	
			7	Refuse to answer (No laik long bekim)	
45	SOURCE OF CONTRACEPTIVE	Where did you obtain these contraceptives? (Yu kisim ol displa rot blong stopim pikinini long kamap long we?)	1	Shop	
			2	Pharmacy/ Chemist	
			3	Govt. clinic/Health centres/Hospital	
			4	Private doctor/Nurse/Clinic	
			5	Friend	
			6	Other (Narapela)	
			7	Refuse to answer (No laik long bekim)	
46	WHO MADE DECISIONS ABOUT CONTRACEPTIVE	Whose decision was it to use a contraceptive? (Husait stret bin tok long usim rot blong stopim pinikini long kamap?)	1	My decision (Mi yet)	
			2	My partner's decision (Partner blong mi)	
			3	Joint decision (Mi na partner wantaim)	
			4	Other (Narapela)	
			5	Refuse to answer (No laik long bekim)	

If you are a male, answer question 47; if you are a female, go to question 48. (Sapos yu wanpla man, go long question 47; sapos yu meri, go long question 48.)					
No.	**VARIABLE**	**QUESTION**		**RESPONSE OPTIONS**	**SKIP**
47	WHETHER PREGNANCY OCCURED	Did your girlfriends (partner) ever become pregnant by you? (Yu igat ol poro meri or partner husait ibin kamapim pikinini wantaim yu?)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
48		Did you ever become pregnant by your boyfriend (partner)? (Yu bin kamapim pikinini tu wantaim poro man or partner blong yu?)	1	Yes	
			2	No	
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	
49	WHETHER PREGNANCY OCCURED	What happened to the pregnancy? (Wanem samthing kamap long displa pikinini?)	1	Currently pregnant (Mi stap wantaim pikinini nau)	
			2	Abortion (Rausim pikinini)	
			3	Miscarriage (Pikinini dai long bel)	
			4	Live birth (Mi karim live pikinini)	
			5	Other (Narapela)	
			6	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
50	CONCERN ABOUT HIV AND STIs	Were you ever concerned that you might catch HIV/AIDS or sexually transmitted infections? (Yu bin tingting planti tu olsem nogud yu kisim sik HIV/AIDS or STIs?)	1	Very concerned (Mi bin tingting planti stret)	
			2	Somewhat concerned (Mi no tingting planti tumas)	
			3	Not concerned (Mi no tingting planti)	
			4	Other (Narapela)	
			5	Refuse to answer (No laik long bekim)	
51	PREVENTIVE STEPS TAKEN AGAINST HIV AND STIs	Were you about to do anything to reduce the risk of HIV or sexually transmitted infections? (Yu bin tingting long mekim sampla samthing long abrusim sik HIV or STIs too or nogat)	1	Yes	
			2	No	
			3	Don't know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	
52	EVER HAD STIs	Have you ever had a sexually transmitted infection? (You bin kisim sik STI tu or nogat?)	1	Once (Onepla taim)	
			2	More than once (Planti taim)	
			3	Never (nogat tru)	Go to 54
			4	Other (Narapela)	
			5	Refuse to answer (No	

				laik long bekim)	
53	SOURCE OF STI TREATMENT	On the last occasion of being infected with a sexually transmitted infection, did you seek treatment? (Las taim yu bin sik wantaim STI, yu bin go kisim marasin tu?)	1	Yes	
			2	No	
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	
54	WHETHER PARTNER WAS TREATED	Did your sexual partner (any of your partners) also obtain treatment? (Ol man or meri yu kuap wantaim ibin kisim marasin tu?)	1	Yes	
			2	No	
			3	Don’t know (Mi no save)	
			4	Refuse to answer (No laik long bekim)	

Section 4. Use of sexual and reproductive healthcare services					
No.	**VARIABLE**	**QUESTION**		**RESPONSE OPTIONS**	**SKIP**
55	USE OF HEALTHCARE SERVICE	Have you ever visited a healthcare facility or doctor of any kind to receive service or information on contraceptive, pregnancy, abortion or sexually transmitted infection? (Yu bin go long wanpla clinic or lukim wanpla docta or health worker long kisim servis or helpim long ol way blong stopim pikinini long kamap, long rausim pikinini long bel or long abrusim sik STI or nogat?)	1	Yes	
			2	No	Go to 68
			3	Other (Narapela)	
			4	Can't remember (Nonap long tingim)	
			5	Refuse to answer (No laik long bekim)	
56	NUMBER OF VISITS TO HEALTHCARE FACILITIES IN THE PAST 6–12 MONTHS	How many times have you sought services or information from a doctor or a nurse for these services? (Hamas taim tru yu bin go checkim ol servis long wanpla docta or nurse long kisim ol displa servis?)	1	_____number of times	
			2	Did not seek care in the last 6–12 months (Mi no go painim halivim long hausik long last 6 mun go inap 12 mun)	Go to 68
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	
57	TYPE OF HEALTHCARE SERVICE RECENTLY VISITED	Thinking about your last visit, did you to go a government clinic, health centre or hospital or a private doctor or clinic? (Long last taim yu go long clinic or long lukim docta, yu bin go long wanpla clinic or hausik blong gavman or wanpla private clinic?)	1	Government	
			2	Private	
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
58	REASON FOR MOST RECENT VISIT	When you last saw a doctor or a nurse, what was your reason for going? (Long lastpla taim yu go lukim docta or nurse, yu bin go long wanem reason?)	1	Contraception	
			2	Sexually transmitted infection	
			3	Gynaecological examination	
			4	Pregnancy test	
			5	Pregnancy termination	
			6	MCH	
			7	Other (Narapela)	
			8	Refuse to answer (No laik long bekim)	
59	WHETHER HEALTH WORKER TALKED ABOUT CONTRACEPTION, STIs OR PREGNANCY	Did the doctor or nurse talk to you about contraception, sexually transmitted infections or pregnancy? (Docta or nurse bin toktok long you long ol way blong stoppim pikinini long kamap na long abrusim ol STIs tu or nogat?)	1	Yes	
			2	No	
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	
60	WHETHER CONTRACEPTIVE SERVICE WAS REQUESTED	Did you request contraceptive services during the consultation? (Yu bin askim long ol way blong stoppim pikinini long kamap taim yu go long ol docta na nurse?)	1	Yes	
			2	No	
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
61	EXPOSURE TO INFORMATION ABOUT CONTRACEPTIVES	At this facility, did you see any poster on contraception? (Long dispel klinik, yu bin lukim sampla poster soim ol way blong stoppim pikinini long kamap?)	5	Yes	
			6	No	
			7	Other (Narapela)	
			8	Refuse to answer (No laik long bekim)	
62		Were you given brochures on contraception? (Ol bin givim sampla liklik book long ol way blong stoppim pikinini long kamap tu?)	1	Yes	
			2	No	
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	
63	WHETHER RESPONDENT FELT ABLE TO ASK QUESTIONS	Did you feel comfortable enough to ask questions? (Yu bin pilim orait long askim question tu or nogat?)	1	Yes	
			2	No	
			3	Other (Narapela)	
			4	Refuse to answer (No laik long bekim)	
64	WHETHER QUESTIONS WERE ANSWERED ADEQUATELY	Were the questions you asked during the consultation answered adequately? (Taim yu askim question, ol lain bin answerim question blong yu gud too or nogat?)	1	Yes	Go to 68
			2	No	Go to 68
			3	Other (Narapela)	Go to 68
			4	Refuse to answer (No laik long bekim)	Go to 68

No.	VARIABLE	QUESTION		RESPONSE OPTIONS	SKIP
	People may have mixed reasons for not having sexual intercourse. In the following questions, I will ask you to tell me your reasons for not having sexual intercourse. (Ol lain save igat planti kain reason long ol ino kuap. Ol displa ol question, bai mi askim yu long tokim mi ol reason blong why yu no kuap.)				
65	REASONS FOR VIRGINITY	What are your reasons for not having sex? You can choose more than one reason. (Wanem ol samthing or reason mekim na yu no kuap?) (Yu ken makim planti reason.)	1	I don't feel ready to have sex. (Mi no feel mi redi long kuap.)	
			2	I have not had the opportunity to have sex. (Mi no bin gat sans long kuap.)	
			3	I think sex before marriage is wrong. (Mi ting em wrong long kuap taim yu no marit yet.)	
			4	I am afraid of getting pregnant. (Mi poret long kamapim pikinini.)	
			5	I am afraid of HIV/AIDS or sexually transmitted infections. (Mi poret long HIV/AIDS or STI.)	
			6	Other (Narapela)	

			7	Refuse to answer (No laik long bekim)	
66	FUTURE PLANS	Now I have a question about your future plans about sexual intercourse. Which of these statements best describe your plans? (Now mi laik askim long plan blong yu long bihain long sait blong kuap. Wanempla blong ol displa plan em clostu stret or wankain olsem plan blong yu?)	1	I plan to wait until marriage. (Mi plan long wait inap mi marit.)	
			2	I plan to wait until I am engaged to be married. (Mi plan long wait inap long taim mi laik marit stret.)	
			3	I plan to wait until I find someone I love. (Mi plan long wait inap mi painim wanpla mi laikim trutru long lewa blong mi.)	
			4	I plan to have sexual intercourse when an opportunity comes along. (Mi plan long kuap wanem taim wanpla sans kamap long mi long kuap.)	
			5	Other (Narapela)	
			6	Refuse to answer (No laik bekim)	

67	PRESSURE TO HAVE SEX	Do you feel any pressure from others to have sexual intercourse? (Yu pilim sampla kain presa long ol narapla lain long yu mas kuap tu or nogat?)	1	A great deal (Bigpla tru)	
			2	A little (Liklik)	
			3	None (Nogat)	
			4	Other (Narapela)	
68	If you have any comments to make, please state them here. (Sapos yu gat sampela koments long mekim, plis raitim ol long hia.)				

Thank you very much for participating in this research. All your answers will be kept confidential and used only for the purpose of this research. If you have any questions, you can always ask us by emailing us. Our contact details are on the information sheet you can download and keep.

This is a token of appreciation for your time and usage of your data. A PGK20.00 phone credit (Digicel/mobile) will be sent to your phone. Kindly insert your phone number here:

(Tank yu tu mas long yu ansarim ol questens long dispela wok painim aut bilong mi. Olgeta ansa bilong yu bai mipela kipim sef na confidential. Bai mipela usim ol ansa bilong yu long wokim tasol wok long dispela wok research. Sapos yu gat questen yu ken emailim mipela long email adres stap long information sheet we yu ken daun loadim na kipim. Long sowim hamamas bilong mipela long taim na data bilong yu, bai mipela salim PGK20.00 credit go insait long fone bilong yu. Plis rait fone namba bilong yu long hia.)

Digicel/Bemobile phone number (fone namba):

Appendix 2: Participant Information

Project title: Factors that influence Papua New Guinean young people's sexual and reproductive health that may affect their completion of tertiary programs: A mixed methods study

Participant information sheet

Aim of this study:

To describe and understand factors that influence Papua New Guinean young people's sexual and reproductive health and its relationship to their successful completion of tertiary (university) education.

The key objectives of this study are:

1. Describe the sexual and reproductive health knowledge and practices of university students.
2. Explore and explain the individual, social and cultural factors that influence the sexual and reproductive health of university students.
3. Analyse barriers and enablers for university students accessing sexual and reproductive health services, including the influence this may have on program (course) completion.
4. Apply the socio-ecological model to identify key recommendations that will inform and improve the sexual and reproductive health of university students.

Why is this study needed?

Young people, including students, are engaging in sex. We cannot stop people from having sex, but we can help people, especially young ones, make informed choices on how to avoid (1) getting sexually transmitted infections (STIs), such as HIV, syphilis, gonorrhoea and chlamydia, and (2) having unwanted pregnancies. Right now, PNG has the highest number of STIs, including HIV, in the Pacific. It also has one of the highest rates of pregnancy-related deaths in the world. PNG has more young people (youths and adolescents) than older adults. If our young people are not provided with help to avoid STIs and unwanted pregnancies, their sexual health and wellbeing will drop, and more young people will sink into poverty. The

findings from this study will inform health policymakers on how young people, especially students in tertiary education, are accessing sexual and reproductive health information and services. Having access to vital information leads towards timely access to healthcare services and reduces the rate of STI transmission and unwanted pregnancies.

How will we perform this study?

We will perform this study in two phases:

Phase 1. We plan to collect information from tertiary students using a self-administered questionnaire. Only students who agree to participate will be given a paper questionnaire to complete in their own time (*which was changed to an online survey, because of the COVID-19 pandemic*).

Phase 2. We plan to collect information from students using semi-structured interviews (*which was changed to telephone interviews*). Again, only students who are willing to participate will be interviewed.

You can contact us for details and clarification. Our contact details are as follows:

Principal investigator
Ms Maggie Baigry
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Appendix 3: Informed Consent Form

INFORMED CONSENT FORM – ENGLISH

PRINCIPAL INVESTIGATOR:	Maggie Baigry
PROJECT TITLE:	Factors that influence Papua New Guinean young people's sexual and reproductive health that may affect their completion of tertiary programs: A mixed methods study
COLLEGE:	College of Medicine and Dentistry

I understand that this study aims to describe and understand factors that influence Papua New Guinean young people's sexual and reproductive health and its relationship to their successful completion of tertiary (university) education.

I understand I will be involved in an interview with my consent, which will be audio recorded. The primary researcher stated that the discussion would focus on young people and sexual health, which may require sensitive information.

I agree that the researcher may use the results as described in the information sheet.

I acknowledge that:

- taking part in this study is voluntary, and I am aware that I can stop taking part in it at any time without explanation or prejudice and to withdraw any unprocessed data I have provided;
- that any information I give will be kept strictly anonymous.

Appendix 4: Telephone Interview Protocol

Data collection step: Phase 2 (Structured telephone interviews)

Step 1. Text message: An invitation to potentially purposively sampled participants

Hello. A delightful morning's greetings to you. I hope you still remember that in February 2021, you were one of the anonymous participants who answered questions in an online survey about young people's sexual and reproductive health in PNG. At the end of the survey, we asked you to provide this number so we can thank you for your time spent on answering the questions. Thank you very much for taking part in our survey. For your information, we have analysed the data in the survey. We are now asking a small number of anonymous participants like you who have participated in the survey to share their views, explanations and opinions on the results. This will happen as a telephone interview based on a short story after completing the survey results. Would you be interested in sharing your views, explanations and opinions? No need to reply to this message, but you can if you want to. I will call you later today to get your answer. Thank you very much. My name is Maggie Baigry, and I am a PhD Candidate at James Cook University.

Step 2. First phone call

Hello, my name is Maggie Baigry, and I am a PhD student from James Cook University who sent you a message this morning about a telephone interview with me. Would you be interested in a one-on-one telephone interview? Thank you very much. Have a great day. Bye.

Step 3. If the participant agreed to participate

Inform participants that the telephone interview will last approximately 30 minutes to 1 hour, depending on how much they want to share. Ask the participants to indicate a suitable time for the interview call. Arrange a date and time with them. Ask them to provide a pseudonym instead of their real names so they can remain anonymous during the interview. Ask participants if they want a participant information sheet. Send them the information sheet.

Step 4. Reminder text message

Send a friendly reminder text message to participants 1 or 2 hours before the telephone interview, reminding them to be in a safe and secure space with their phone battery charged.

Step 5. Telephone interview

Script for establishing rapport and obtaining verbal consent

Good day (greeting) and thank you very much for your time. Before we begin, I seek your permission to audio record our conversation because I do not want to miss your comments. Is this OK with you? Thank you very much. May I turn on the digital voice recorder? Thank you (pseudonym).

This interview focuses on young people's sexual health; therefore, there are no right or wrong answers to any questions that I will ask you. I am only interested in hearing your views, opinions and explanations. I will keep your responses to the interview questions confidential, meaning I will not identify you as a participant in the research report. This interview is entirely voluntary on your part. You are free to answer questions or not to answer questions. You are also free to stop the interview anytime. You don't have to provide any reason for doing so. Do you have any questions about what I have just explained?

Are you happy to be interviewed today? Thank you.

It would help if you could tell me a bit about yourself. For example, where are you from? What province do you feel most connected to if you are of mixed parentage? What do you plan to do after graduating from university?

Today's discussion will be based on a short story I will share with you. As the lead researcher for this study, I wrote this short story based on the responses of young men who participated in the survey. I kindly ask that you listen as I read it, and we can then discuss it.

Narrative (Story)

Dulcie is a 22-year-old young woman who attends [name removed] University as a third-year student. Dulcie's father is from East Sepik Province, and her mother is from East New Britain and Milne Bay Provinces. Dulcie's family is Christian and belongs to the Roman Catholic Church. Dulcie grew up in Port Moresby, where both of her parents worked and lived. Dulcie's family has regularly visited her father's and mother's villages in Sepik and Rabaul. While attending [name removed] University, Dulcie resides with other female students in a dormitory. Dulcie has secretly dated Duncan for the past six months. Duncan is also a third-year student. Both Dulcie and her boyfriend Duncan have had sex on several occasions.

That is the end of the short story summarising survey data responses. I would now like to ask you a few questions about your response to this story.

First, I would like to ask about support for young people's sexual health.

In your opinion, should young women like Dulcie use contraceptives? Why? What types of contraceptives should they use? Where would they get them? Why?

> **Prompts:** Who else could get contraceptives if Dulcie is not able to? Where would young people like Dulcie and Duncan get sexual health support?
>
> **Prompts:** What roles do fellow students, friends and peers play in providing sexual health support? What roles do university student services play in providing sexual health support? What roles do family members like sisters, aunties, mothers, brothers and fathers play in providing sexual health support?

Second, I am wondering about access to sexual and reproductive health services for female students.

Dulcie is now pregnant. Can you share an experience of seeing someone like Dulcie becoming pregnant? Why?

> **Prompts**: Would girls who share the dormitories help someone like Dulcie? Why?
>
> **Prompts**: Are there any cases of abortion among young women living in university dormitories? Why? Were young women able to seek proper clinical care? Why?

Dulcie has been sick with a high fever and abdominal pain. She also experienced pain when passing urine and saw abnormal yellowish discharge coming from her vagina. What do you think is happening here? Why?

> **Prompts:** What should Dulcie do about these symptoms? Why?
>
> **Prompts:** Where would she go to get help? Why?

Now, my last question. If you were in a position to make a change, what would you like to do to change Dulcie and Duncan's story?

> **Prompts**: What would you do to enable young men and women to have good and healthy sexual and reproductive health? Why?

Thank you very much for your time and the information you shared today. Your responses will be kept confidential and used only for this research. As a token of appreciation, I will send you a PGK20.00 (AU$15.00 AUD) phone credit to your phone number.

Step 6. Send phone credits to their phone numbers

Go to Digicel's online page and send a phone credit of AU$15.00 (AUD) to the participant's phone number.

Appendix 5: Male Interview Guide

Introduction

Thank you for agreeing to participate in this interview and completing the online survey in February 2021. I have asked to interview you so we can better understand the responses made in the online survey you recently completed. For your information, data in the survey were analysed, and some results are as follows: 228 students from across the six universities in Papua New Guinea completed the questionnaire. All respondents were young adults with an average age of 23 years. The majority of the respondents were year three students, while the least were year one students. Most respondents were residential students residing in university dormitories (69%, n = 157). At the time of the survey, most of the respondents self-identified as still single (89%, n = 202), followed by fewer engaged and married.

This interview focuses on young people and sexual health; therefore, there are no right or wrong answers to any questions that I will ask you. I am only interested in your explanations, views and opinion. Please note! Participating in this interview is voluntary, and your decision to participate or not to participate will not affect your usual daily way of life. This interview will take approximately one hour, depending on how much information you would like to share. Do you have any questions about what I have explained?

I will keep this interview, especially your responses, confidential, meaning I will not identify you as a participant in my research reports. Do you have any questions about what I have just explained?

I would like to audio record this interview with your permission because I do not want to miss your comments. Is this OK with you? Thank you. May I turn on the digital recorder? Thank you.

Establishing rapport

Before we begin, it would help if you could tell me a bit about yourself, for example: Where are you from? If you have mixed parentage, what Province do you feel most connected to? What do you plan to do after graduating from university?

Our discussion today will be based on a short story that I am about to share with you. The lead researcher for this study wrote this short story based on the responses made by young men who participated in the survey. I kindly ask that you listen as I read it, and we can then discuss it.

Story (Storytelling)

Duncan is a 22-year-old young man who attends [name removed] University as a third-year student. Duncan's father is from East Sepik Province, and his mother is from Simbu Province. Duncan's family are Christians and belong to the Seventh-Day Adventist Church. Duncan grew up in Lae as both of his parents were working and living in Lae. Duncan's family has had regular visits to his father and mother's villages in Sepik and Simbu. While attending [name removed] University, Duncan resides with other male students in a dormitory. Duncan has secretly dated Dulcie for the past six months. Dulcie is also a third-year student. Both Duncan and his girlfriend Dulcie have had sex on several occasions.

That is the end of the short story that summarises responses from the survey data. I want to ask you a few questions about your response to this story.

Firstly, I would like to ask about support for young people sexual health. In your opinion, should girls like Dulcie use contraceptives? Why?

Should young men like Duncan use contraceptives? Why?

What types of contraceptives? Where would they get them?

> **Prompts**: Who would get contraceptives if Duncan is not able to? Where would young people like Duncan and Dulcie get sexual health support?
>
> **Prompts:** What roles do fellow students, friends/peers play in providing sexual health support?

What roles do university student services play in providing sexual health support?

What roles do family members like sisters, aunties, mothers, brothers and fathers play in providing sexual health support?

Secondly, I am wondering about access to sexual reproductive health services for male students. Duncan is worried that Duclie is now pregnant. Can you share an experience of seeing someone like Duncan's girlfriend becoming pregnant?

Prompts: Would boys who share the dormitories with Duncan be able to help him? why?

Prompts: Are there any cases of abortion amongst young people like Duncan and Dulcie? Why?

Were young couples like Duncan and Dulcie able to seek proper clinical care? Why?

Duncan has been sick with a high fever and abdominal pain. He also experienced pain when passing urine and saw abnormal yellowish discharge coming from his penis. What do you think is happening here? Why?

Prompts: What should Duncan do about these symptoms? Why?

Prompts: Where would he go to get help? Why?

Finally, my last question. If you were in a position to make a change, what would you like to do to change Duncan and Dulcie's story?

Prompts: What would you do to enable young men and women to have good and healthy sexual and reproductive health? Why?

Thank you very much for your time and the information you shared today. All your responses will be kept confidential and will be used only for this research. As a token of appreciation, I will send you a K20.00 phone credit to your phone number.

Appendix 6: Use of Framework Analysis

Using framework analysis

Framework identification (Step 2): Use of contraceptives

Initial framework	Revised framework		Female participant	Male participant
Use of contraceptives	Individual responsibilities	*Individual choice to obtain contraceptives*	• Female Participant 3: I think so, depending on their preference or something. If they want to use contraceptives, then they do. It is an individual thing. So, you take ownership of your own life, something like that.	• Male Participant 3: As for me, I'll not hesitate to go because my safety, my future and my girlfriend's future are important. So, I will not hesitate to go to the clinics to prevent such things that result in pregnancy. I don't want to regret those things later.
	Lack of contraceptive knowledge	*Reasons that some women are not using contraceptives*	• Female Participant 1: Some girls are too afraid of using contraceptives because they are unaware of them. They lack awareness and probably don't know about the different types of contraceptives, such as condoms and others. For some, it's out of ignorance that they don't feel comfortable using these different contraceptives. For some, they don't know how to use it. For some ladies, it's like first-timers or something like that. In terms of contraceptives [nervous laughter], they'll be like confused about how to use them or something like that. But otherwise, some ladies are too afraid to seek advice and purchase these contraceptives. They are afraid of using condoms. Some ladies are not going to purchase, and they are too ashamed of being exposed to sexual acts.	

	Sexual health services	*Contraceptives are available at the hospitals*	• Female Participant 5: Do young women use contraceptives? Some do. For example, during my rotation in the Obstetrics and Gynaecology ward, I saw some young women come in for contraceptives, but I am unsure whether they used them. But I would say few, about 25%, came for contraceptive methods at the hospital. I had not seen a lot of girls coming for pills when I was at the hospital. Most came for the Deprovera, and some girls got the implants. Is this knowledge or information about young girls going to the hospital to get an implant widely known? No, it's not widely known. How can we make it known to everyone? Awareness
		A judgemental view of young women despite high rates of sexually transmitted infection and high maternal morbidity and mortality rates from pregnancy-related causes	• Female Participant 5: Well, when we go to awareness, we are encouraging the young girls to go and have sex like that. That is one disadvantage of this service—the reason that the hospital did not make awareness of this information. Because the young will know they are protected from becoming pregnant, they can do whatever they want. They can get HIV; the risk of contracting HIV is high these days. Or they can contract sexually transmitted infections. That is why the hospital did not do awareness of the availability of implants for young women. But if they come to the hospital, they will get the contraceptives.
	Prevent unintended pregnancies	*Reasons that young university students must use contraceptives* *Risk of STI; therefore, use condoms*	• Male Participant 2: I think at that stage of life; they are still at school. I think they should wait for a more appropriate time to cause intimate relationships. The result of having sexual intercourse is to bear children. I think contraceptive methods can be vital to apply to these types of relationships to minimise potential outcomes of sexual intercourse. At school, there is always an end-of-semester break. During the break, they probably go to separate locations, and there is a big possibility that one partner may be unfaithful, practice sexual intercourse with other partners and bring sexually transmitted infections into the relationship. Families are not expecting them to have a child

			because they have not graduated. In the Papua New Guinea society, our families expect us to give back to them because they have put us in schools. So, I think if the relationship results in a pregnancy, it will not go well with the expectations of the parents or the extended families. • Male Participant 3: I think both of them are still studying and are not in their final year of studies. Both of their families had spent a lot on their school fees. Sometimes, the feeling is intense when they are together. For instance, Dulcie might not care when she is having her menstruation, so they should use preventive measures to prevent Dulcie from getting pregnant. • Male Participant 4: Should girls like Dulcie use contraceptives. They should use protective measures to prevent themselves from unwanted pregnancies. • Male Participant 5: One is to prevent unwanted pregnancies. Two, to prevent some sexually transmitted infections. *Interviewer: Why are Duncan and Dulcie preventing pregnancy from happening?* Because they are students, they would not want such a thing to happen, especially to females. It might disturb her studies. For example, she might become pregnant.
	Condoms	*Highly recommended because the correct use of condoms prevents pregnancies and sexually transmitted infections*	• Male Participant 1: Condoms are not a hundred per cent safe and may break during sex. • Male Participant 2: For STI and pregnancy, I think the best method is condoms because using other contraceptive methods will only prevent pregnancy but not sexually transmitted diseases or infections. I think they should use condoms and stay faithful. Promote faithfulness in one relationship. • Male Participant 3: What type of contraceptives can Duncan and Dulcie use? They can use condoms.
	Unmarried women	*Young unmarried women should not use contraceptives*	• Male Participant 1: Sex is for married people only and is a blessing to have sex so they can have children.

	Unsafe for young women	*Contraceptives have side effects and should not be used by women*	• Male Participant 1: I think contraceptives have some side effects, so it is unsafe for young women to use them. Pills also have side effects if they are using pills. When they are having sex and she is getting pills, it will prevent pregnancy, but she can also get sexually transmitted diseases. I would not recommend pills to young girls because they are not safe to use.	
	Barriers	*Personal barriers to accessing sexual health services* *Ignorance or taking the risk and not expecting to fall pregnant* *Interpersonal barriers—such as not wanting to be seen when buying or getting condoms*	• Female Participant 4: Were the girls, your friends, able to get and use contraceptives? No, I don't think so. Was it difficult or a personal decision not to get contraceptives? I think it was difficult for some of them. But some of them thought that they would not result in pregnancy and instead became pregnant.	• Male Participant 4: About some challenges. You know, they feel shame, especially in front of their friends. One of the challenges is the feeling of shame/shyness especially going to the clinics and asking for condoms. In your opinion, is this a major for young people? It's a big issue but something we don't discuss. For example, many students are ashamed to visit clinics to get contraceptives, thus resulting in unwanted pregnancies. Unfortunately, unwanted pregnancies disrupt their education. So, we need some proper awareness about this issue.
	SRH services	*Access condoms at the healthcare aid post or university clinics*	• Female Participant 5: Young women came through the normal process and approached the nurses. Unlike in the past, when	• Male Participant 2: I think they have clinics, NGOs [non-government organisations] and other organisations such as the Susumamas and Family Welfares to access. For

	contraceptives are given to couples for family planning, the children. At present, any young woman of reproductive age can visit the hospital to get implants.	pregnancy, the lady can, Dulcie can go and get implants to control pregnancy, and the male can get regular supplies of condoms. They can also get periodic tests from time to time to ensure that they have no sexually transmitted infection within the relationship. • Male Participant 3: Where do they get condoms? I think at their campus, especially at Divine Word University, they can get it at their health centre or visit the aid post. Is that the same for the University of Papua New Guinea? Does UPNG have a clinic? Yes.
Peer Support	• Female Participant 6: I experienced seeing my elder sister using the implant as a family planning method to space her children. That is why I told my friend to use an implant.	

Appendix 7: Ethics Approval Notice—PNG Medical Research Advisory Committee

Appendix 8: Ethics Approval Notice—James Cook University Human Research Ethics Committee

Appendix 9: Ethics Approval Notice—Divine Word University Research Ethics Committee

Appendix 10: External Human Research Ethics Committee's Amendment Acknowledgement

This administrative form has been removed

Appendix 11: Final Ethics Report Approval Notice

This administrative form has been removed

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