

**NUTRITION KNOWLEDGE, ATTITUDES, PRACTICES, AND SELF-EFFICACY FOR  
ADOLESCENT GIRLS LIVING WITH HIV IN THE KINGDOM OF ESWATINI, MANZINI  
REGION**

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## DEFINITIONS OF KEY TERMS

<b>Variable</b>	<b>Definition</b>
<b>Adherence club</b>	It is a safe space for peer support group and an information-sharing forum for children and adolescents living with HIV and on antiretroviral treatment (George Town University, 2020).
<b>Junk Foods</b>	These are foods with high in energy, low in nutrient content and high in fat. e.g., snack foods with added sugar like biscuits and soft drinks (WHO, 2018).
<b>Nutrition</b>	Nutrition is the study of nutrients in food, how the body uses them, and the relationship between diet, health, and disease (Newman T, 2020).
<b>Nutrition knowledge</b>	This refers to individuals' understanding of nutrition, including the intellectual ability to remember and recall food and nutrition-related terminology, specific pieces of information, and facts (WHO, 2005).
<b>Nutrition Attitudes</b>	Attitudes are emotions, motivational perceptive, and cognitive beliefs that positively or negatively influence the dietary behaviour or practice of an individual (Nana & Zema, 2018).
<b>Nutrition Practices</b>	Defined as observable actions an individual could affect his or her nutrition such as eating, feeding, washing hands, cooking, and selecting foods (Nana& Zama, 2018).
<b>Nutrition Self – efficacy</b>	Confidence is one's ability to take action and overcome barriers related to achieving a healthy diet (Glanz & Rimer, 2002).
<b>Theory of planned behaviour</b>	It is a theory that examines the state that an individual's behaviour as resulting from intentions which in turn are influenced by attitudes, subjective norms, and perceived behavioural control (Glanz & Rimer, 2002).
<b>Theory of reasoned behaviour</b>	It is used to explain attitudes towards the behaviour, perceived norms, and perceived behavioural control to determine peoples' intentions while peoples' intentions predict their behaviour (Glanz & Rimer, 2002).

## ABSTRACT

### **Title: Nutrition Knowledge, Attitudes, Practices and Self - efficacy for Adolescent Girls living with HIV in the Kingdom of Eswatini, Manzini Region**

MPHN Mini-thesis, School of Public Health, University of the Western Cape

**Background:** Nutrition is essential for adolescents living with HIV as it promotes long-term health and wellness by ensuring the maintenance of good body strength and weight as well as replacing vitamins and minerals. Good nutrition assists adolescents in the physical growth and development of body muscles which improve the performance of the immune system. About 2800 adolescents between the ages of 15 -19 years old are living with HIV in the Kingdom of Eswatini. Several programme interventions including conducting health facility-based adherence clubs have been implemented to support and care for adolescents living with HIV. These platforms provide an opportunity for adolescents to learn and share nutrition and HIV adherence information.

**Aim:** The study sought to assess the nutritional knowledge, attitude, practices, and self-efficacy of adolescents living with HIV. It also examined what individual factors were associated with better nutritional knowledge, attitude, practices, and self-efficacy and adolescents living with HIV.

**Methodology:** a cross-sectional study that used a quantitative approach was conducted. Adolescent girls living with HIV (n=233) were sampled through a convenient sampling method of six health facilities in the Manzini region three (3) in urban and three (3) in rural. Data on nutrition knowledge, attitudes, practices, and self-efficacy was collected using a structured paper-based questionnaire. The data tool was piloted for validity and a coefficient of 0.794 was established from 20 questionnaires (Cronbach's Alpha). The data was analysed using descriptive statistics in the Statistical Package for the Social Sciences (SPSS). Descriptive statistics and bivariate analysis were done using Spearman's correlation to complete the analysis.

**Findings:** The study revealed that more than 70% of the adolescents studied, possessed good nutritional knowledge, practices, and self-efficacy. However, there are nutritional knowledge gaps that existed on vital nutrients like the substitution of animal protein with plant protein, dietary fiber, and antioxidants. Further, a Spearman's correlation analysis between independent and dependent variables of adolescent girls living with HIV (N=233) was computed to assess the relationship between nutritional knowledge, attitude, practices, and self-efficacy. The

results show that an association between nutritional knowledge and self-efficacy was very weak, co-efficient of 0.0976. The correlation between practice and two attitudes and practices, were also weak, with co-efficient of 0.1408 and 0.1544 respectively. However, the association between practice and self-efficacy was medium and statistically significant.

**Conclusion:** The study concludes, that despite adolescent girls having good nutritional knowledge, practices, and self-efficacy, there is a need to enhance and develop nutritional education programmes that will desirably shift their nutritional attitudes and knowledge gaps. The study recommends that nutrition and HIV/AIDS programmers should incorporate additional nutritional information on adolescent's adherence clubs' curriculums in order for them to better understand food preparation, handling and hygiene. It is also important to include their parents and care givers as well, so they further build the skills into the adolescents at household level.

**Date: November 11<sup>th</sup>, 2022**

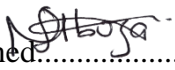


## DECLARATION

I declare that **Nutrition Knowledge, Attitudes and Practices for Adolescent Girls Living with HIV in the Kingdom of Eswatini, Manzini Region** is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Full name. Nomathemba P. Sibozu

Date: 11 November 2022

Signed: .....



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## LIST OF ACRONYMS/ABBREVIATIONS

<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>AG</b>	Adolescent girl
<b>AGYW</b>	Adolescent Girls and Young Women
<b>ALHIV</b>	Adolescents living with HIV
<b>FAO</b>	Food and Agricultural Organization
<b>HIV</b>	Human Immune deficiency Virus
<b>NHRRB</b>	National Health Research Review Board
<b>UNAIDS</b>	The Joint United Nations Programme on HIV/AIDS
<b>UNICEF</b>	The United Nations Children Fund
<b>WHO</b>	The World Health Organization



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## CHAPTER 1: INTRODUCTION

### 1.1 Background

In 2019, a total of 1.7 million adolescents between the ages of 10–19 years were living with Human Immunodeficiency Virus (HIV) worldwide. This number accounts for at least 5% of the total people living with HIV and, of these, 1.5 million live in sub-Saharan Africa (UNICEF, 2020). Although HIV is a global problem, Eswatini ranks among the countries with the highest HIV prevalence of 27% which is inclusive of adults and children. The Joint United Nations Programme on HIV and AIDS (UNAIDS) has a target of ensuring that there are no Adolescent Girls and Young Women (AGYWs) aged 15 – 24 years who are newly infected with HIV each year.

In most cases, new HIV infections occur due to the lack of knowledge, skills, access to treatment, or other challenges that include gender discrimination in the context of violence, poverty, and food insecurity (UNAIDS, 2018b). The Global Fund reports that in sub-Saharan Africa, girls and young women are at twice the risk of HIV infection than their male counterparts. Africa's youth population is expected to increase by 40% over the next decade (Global Fund, 2019). This increase is a cause for concern, and failure to act decisively may lead to a resurgence of HIV, sparking an increase in new infections which may ultimately spiral levels of the epidemic as observed in the early 2000s.

In 2016, the Kingdom of Eswatini had a total of 2800 adolescents of ages 15-19 years (0.25% of the total population and 7% of adolescents) and 4000 young women of 19 – 24 years (0.36% of the total population and 14.4% of young women) living with HIV (UNAIDS, 2018a). The table below shows the incidence for adolescents in Eswatini:

**Table 1.1: Incidence of HIV/AIDS among different age and sex groups within the population of Eswatini**

	<b>Incidence of HIV/AIDS among adolescents</b>	
<b>Age</b>	<b>Male</b>	<b>Female</b>
10- 14 years	2.8%	1.5%
15 – 19 years	0.52%	1.67%

Source: SHIMS 2, 2018. Swaziland HIV Incidence Measurement Survey 2 SHIMS2 2016-2017

Evidence suggests that the prevalence of HIV and incidence in Eswatini is higher in females, particularly in adolescent girls and young women (MOH, 2017). These high rates have been linked to several biological, societal, and economic factors. Other key issues affecting adolescents include poverty, lack of education and alternative ways of skills acquisition, teenage pregnancies, and violence (Ara et al., 2019, p.2).

In Eswatini, HIV continues to be a setback among adolescents as they experience various challenges which leave them vulnerable and exposed to risks, including economic exploitation, changing lifestyles, global, regional, and national conflicts, and the spread of sexually transmitted infections and HIV/AIDS (Chen, 2008, p.8). Additionally, physical, and emotional changes that occur during adolescence and early adulthood such as relationship and sexuality exploration also expose young people to the risks of acquiring HIV. HIV continues to be a national crisis in Eswatini, having been among the top ten countries with the highest HIV/AIDS prevalence in Africa (MOH, 2017). This is attributed to behavioural, structural, and biological drivers, which include multiple and concurrent sexual partners, low and inconsistent use of condoms, intergenerational sex, mobility and migration, commercial sex, early sexual debut, gender inequality and sexual violence, low levels of male circumcision, alcohol and drug abuse (Belle and Gamedze, 2019, p.2303).

It has been observed that girls tend to be more vulnerable to HIV due to poverty, early sexual activity, sexual violence, abuse, intergenerational sex, inconsistent

condom use, multiple concurrent partnerships, and high unemployment levels (UNICEF, 2016). The lack of correct health information, indulgence in risky behaviours, and lack of adequate reproductive health services are factors that expose adolescents to the risk of contracting HIV (Christiane et al., 2014). This leaves AGYW prey to sexual activity in exchange for gifts and money to survive, hence exposing them to HIV infection.

Often individuals living with HIV have compromised immunity which exposes them to various opportunistic infections that may be detrimental to health, and when left untreated may lead to severe health conditions and eventually death (Heron and Elahi, 2017, p.13). Furthermore, malnutrition adds fuel to the fire by accelerating the progress of HIV to AIDS (Duggal, Chugh & Duggal, 2012, p.1). Thus, mitigations such as good nutrition are satisfactory in elevating immune defences. Proper and adequate nutrition is therefore essential in HIV-infected people for maintaining a healthy life, strengthening immunity and resistance against opportunistic infections, and reducing muscle wasting (Bello, et al., 2019, p.2290). Hence the need to investigate nutrition knowledge, attitudes, and practices for adolescent girls living with HIV in Eswatini.

## **1.2 Problem statement and rationale**

There are currently no studies that have investigated nutrition knowledge, attitudes, and practices (KAP) of adolescent girls living with HIV in the Kingdom of Eswatini. Observation and anecdotal reports suggest a lack of nutritional knowledge among adolescents, which contributes to unfavourable attitudes and nutritional practices. The UNAIDS (2016) report states that experiences from other countries have shown that nutritional intervention is one key component of care and support for people living with HIV/AIDS especially those in the developing world with limited antiretroviral drugs. Having good nutrition also enhances the effectiveness of Antiretroviral Therapy (ART) (UNAIDS, 2016). Furthermore, nutrition self-efficacy is also imperative to help improve nutrition practices through the re-enforcement of nutrition information so that adolescent girls make excellent food choices.



Eswatini teen adherence clubs focus on building knowledge on adherence and psychosocial support for adolescents on ART. Little information and skill is given to strengthen adolescents' nutrition attitudes and enforcement of good practices that promote positive nutrition self-efficacy (MOH, 2017). Therefore, the purpose of this study was to establish this information to assist HIV/AIDS and nutrition programmes to better understand the issues underlying the nutrition knowledge, attitudes, and practices of adolescents living with HIV. Moreover, nutrition programme planners may apply the information to design nutrition messages that will support nutrition self-efficacy of adolescents living with HIV for adherence clubs.

### **1.3 Aim and objectives**

The study investigated the nutritional knowledge, attitudes, practices, and self-efficacy, as well as the relationship between the identified factors with the socio-demographic characteristics of adolescent girls living with HIV, in the Kingdom of Eswatini, Manzini region.

The study objectives are as follows:

1. To describe the socio-demographic characteristics of adolescent girls living with HIV
2. To assess the nutritional knowledge, attitudes, practices, and self-efficacy of adolescent girls living with HIV
3. To identify knowledge gaps that influence the nutrition practices of adolescent girls
4. To examine the relationship between nutrition knowledge, attitudes, practices, and self-efficacy of adolescent girls living with HIV.

### **1.4 Significance of the study**

This study has sought to assess the nutritional knowledge, attitudes, and practices of the adolescent girls living with HIV in order to identify gaps and also determine the relationship between nutrition knowledge, attitudes, practices and self-efficacy. In conducting this study, the researcher hoped to ascertain how HIV/AIDS adherence clubs offered by government ministries and non-governmental organizations (NGO's) targeting adolescent girls can improve their programmes to

integrate nutrition education during sessions. The study's outcomes will inform the improvement of nutrition programmes for HIV-positive adolescent girls in Eswatini as well as other nutrition programmes in similar contexts. Furthermore, the outcomes of this study are also contributing to the body of literature in the area of nutrition attitudes and practices of adolescent girls living with HIV.

### **1.5 Limitations of the study**

A limitation of this study was time constraints. The data collection was conducted on weekends since most adolescents attend school during weekdays. Due to the COVID-19 pandemic, the number of adolescent girls attending adherence clubs made it difficult to get hold of the targeted population. Furthermore, some of the targeted adolescent girls' ART was collected by their parents thus adolescents were not available for the study. Only the adolescents with parental consent and present on the day of data collection were included in the study. Notwithstanding these challenges, the response rates of the targeted population (see Section 4.2 of Chapter 4) were still sufficient for significant reporting.



## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

This chapter presents a review of conceptual and empirical literature related to nutrition knowledge, attitudes, and practices among adolescent girls living with HIV. Literature was reviewed according to the themes reflected in the study's objectives. It also outlines the theory guiding this study, namely the Theory of Planned Behaviour, and the Theory of Reasoned Behaviour.

### 2.2 What is nutrition knowledge, attitudes, practices (KAP), and Self - efficacy?

Nutrition is defined as the process through which food is ingested, digested, and utilized by the body for growth, reproduction, and maintenance of health. Foods contain different nutrients that include water, carbohydrates, proteins, fats, vitamins, and minerals which are essential for growth and development (Chen et al, 2018, p.95). Adolescents living with HIV need to maintain good nutrition for survival, critical body function, and growth, development, replacement, and repair of cells and tissues as well as chemical processes such as digestion, metabolism, and protection from illness, fighting infections, and recovery from illness (Republic of Kenya Ministry of Health, 2006).

Nutrition knowledge is a person's understanding of nutrition which involves his/her intellectual ability to recall food and nutrition related terminology. For example, the ability for one to know that bread can replace rice as a source of starch. Attitudes are the emotional motivation, perception and cognitive beliefs that positively or negatively influence the behaviour of an individual (Macias & Glasseur. 2014). For example, attitudes towards foods are perpetrated by taboos e.g. liver should not be eaten by children since it affects their lungs despite liver being a good source of iron. Practices are the observable actions of individuals that could affect his/her nutrition such as selecting foods, consumption, feeding, washing hands and cooking. For example, intake of specific foods (junk foods) or specific observable behaviours (Macias & Glasseur. 2014).

Gaining insight about people's nutrition KAP helps to assess, explore and shed insight into choices and determinants of their dietary, hygiene and health habits (Saeidlou et al, 2016, p.286). An insight of adolescents' nutrition during COVID 19 pandemic revealed that dietary habits of adolescents were affected and a decrease food intake for healthy and unhealthy food especially during the first lockdown was noted (Broek el al., 2022). The FAO states that KAP studies should be used for the collection of key information during situation analysis to shape the design of nutrition interventions and evaluate nutrition education interventions (Macias and Glasseur, 2014, p.10). These interventions empower adolescent girls to ensure healthy lifestyle, prevent weight related problems, reduce risks and ensuring that all nutritional needs are adequately met for normal growth, development and functionality of the immune systems.

Nutritional self-efficacy is defined as the ability of one to have confidence to complete a related nutrition task. Therefore, nutrition self - efficacy is often used to modify behaviour or intervene on certain behaviours (Nassuim et al., 2020, p.209). For example, an unbalanced diet with high intake of sugar and carbohydrates and low intake in vegetables and fruits increases the risk of chronic diseases in adolescents. Desirable nutritional self-efficacy may include positive beliefs about the ability to choose healthy food. Evidence has shown that the main predictors of nutrition self - efficacy are physical, social, self-evaluative outcome expectancies concerning healthy nutrition (Shamsalinia et al., 2020, p.38). Self-efficacy also determines how hard a person will try and how long they will continue trying to do something / get something right under trying conditions.

### **2.3 Nutritional requirement of adolescent girls**

Adolescence is a period of rapid physiological, sexual, neurological, and behavioural changes. It lays the foundation for adopting adult roles and responsibilities, including the transition to employment and financial independence, as well as the formation of life partnerships (Das et al., 2017, p.22). Since it is a period of rapid growth, adequate nutrition is crucial for achieving full growth potential, and failure to achieve optimal nutrition may lead to delayed growth (Das et al., 2017, p.23). A study conducted in India revealed that teenagers go through a

stage of puberty whereby they show signs of poor eating behaviours and dietary habits (Sireesha et al., 2017, p.492).

The process of body maturation and development of sexual function during adolescence increases demands for energy, protein and vitamins (Lassi, et al., 2017). Nutrition education is important prior to and during this stage since education may enhance adolescent's knowledge and attitudes, thus improving their dietary practices at an early stage to meet their nutritional demands (Sireesha et al., 2017, p.491). According to a study conducted by Bandeira et al., (2022) nutrition education in adolescents increases the consumption of healthy foods especially fruits and vegetables. Moreover, Fisher et al. (2021) reveals that women of reproductive age face a challenge of micronutrient inadequacy and inadequate dietary diversity especially if they belong to impoverished households. Therefore, this evidence shows that adolescent girls living with HIV have additional nutritional demands caused by the challenge of living with HIV.

Nutrition of adolescent girls (AG's) living with HIV between ages 10 – 19 years is important during this growth stage of the development cycle. Generally, this age bracket receives little health and nutrition attention other than information on reproductive health issues (Christian & Smith, 2018). Inadequacy of energy and/or nutrients can cause nutritional deficiencies, delay physical growth and even stop or delay sexual maturation. In addition, adolescent girls living with HIV are nutritionally vulnerable because of the additional demands imposed by the virus and opportunistic infections. These vulnerabilities can compromise their immune status and subsequent infections leaving them at a risk of excess nutrient loss and malabsorption (UNICEF, 2017).

The growth spurt in adolescence requires rapid tissue expansion with special nutrient requirements, including amino acids for growth of striated muscle, as well as calcium and vitamin D to accommodate bone growth. Energy and nutrition requirements must match the needs of the adolescents as they typically engage in physical work or recreational exercise, which benefits striated muscle mass enlargement (Das et al., 2017, p.23). Appetite increases during adolescence, and inactive individuals are more likely to accumulate fat if they have access to high-

energy food. Adolescents have different nutritional requirements per food group per day for normal body function and maintenance. Table 2.1 shows the different nutritional requirements and their main functions.

**Table 2.1 Nutrient requirements of adolescent girls living with HIV per age group**

Name of nutrient	10- 14 years	15-19 years	Function
Carbohydrates	55–60% carbohydrates	55–60% carbohydrates	Carbohydrates are the body's primary source of energy and the brain's preferred energy source.
Energy	kcal/day = $12.2 \times \text{kg} + 746$	kcal/day = $12.2 \times \text{kg} + 746$	Energy is used for basal metabolism of various organs and tissues, maintaining the internal body temperature, and exerting muscular force to maintain posture and produce motion.
Protein	34 g/day	46 g/day	Protein in repairing and build your body's tissues, allows metabolic reactions to take place and coordinates bodily functions
Iron	8 mg/day	15 mg/day	Iron functions in muscle promotion and increased blood volume
Calcium	1,300 mg/day	1,300 mg/day	Calcium functions in skeletal and muscular development
Zinc	8 mg/day	9 mg/day	Zinc functions in wound healing, immune function, and tissue growth
Vitamin A	600 mg/day	700 mg/day	Vitamin A functions in growth, reproduction, immune function, vision
Vitamin C	0.075(μmol/L)	0.095(μmol/L)	Vitamin C functions in protecting your cells against the effects of free radicals

(Source: Nutrition Care of adolescents living with HIV (no date).

According to Semba and Tang (1999) people living with HIV commonly have poor antioxidant status and deficiencies of other micronutrients. When they consume food lacking in antioxidants, they face the risk of developing negative antioxidant balance and susceptibility of oxidative damage as a result of reduced dietary intake and poor absorption of antioxidant micronutrients (Wilkinson et al., 2018). The main function of antioxidants in adolescents living with HIV is to curb oxidative stress which they face and this stress impairs their immune function and cause rapid disease progression. Most micronutrients e.g., Vitamin A, B, C, and E as well as iron, calcium and zinc are antioxidants which can appear as either pro-oxidant – iron and antioxidant-calcium carbonate. Therefore, the diets of adolescents living with HIV should include antioxidants since their requirements are in significantly higher amounts (Stephensen et al., 2006). Therefore, antioxidants function in the body is limited yet it is most important for adolescents to include them in their daily food choices for maintenance of good health and nutritional wellbeing.

Adolescents living with HIV require food safety precautions as well as food hygiene measures. Therefore, they are encouraged to keep clean home environments, keep clean water for washing hands after using the toilet and following safe food practices which include thoroughly washing hands with soap and water before preparing food and eating (Nutrition Care of adolescents living with HIV, no date). Moreover, good nutrition practices also include drinking safe water, eating unspoiled food and cooking food thoroughly as well as keeping food free of insects and rodents (Nutrition Care of adolescents living with HIV, no date). Adolescence period is also characterized with menstruation which is generally an unpleasant experience for adolescent girls due to poor water, sanitation and hygiene facilities and inadequate menstrual hygiene management (Jain et al., 2017). Therefore, good personal hygiene during this period is vital in ensuring that food consumed is safe and harmful germs that spread through cross-contamination are prevented from causing food borne diseases which may lead to nutrient loss after food consumption.

Dietary fibre is a food component that cannot easily be broken down fully by digestive enzymes since it is partially insoluble food. Examples of foods high in

non- or partially digestible fibre include whole grain cereals, unrefined flour, vegetables and some fruits. The main function of dietary fibre is to enhance bowel movement and the overall health of the digestive system. Food very high in fibre is not desirable for People living with HIV (PLWHA) since it creates a sense of fullness and may lead to eating less, which may not be desirable for PLWHA who need to increase their food intake and fulfil their nutrient requirements (Kenyan Ministry of Health, 2006). Therefore, when promoting desirable nutrition KAP and self – efficacy, it is imperative that good dietary fibre and antioxidants guidance is taken into consideration.

Many adolescents lack adequate nutrition to fuel their rapidly growing bodies and brains, allowing micronutrient deficiencies and anaemia to set in. For adolescent girls, the onset of puberty brings additional threats. Poverty and discriminatory cultural norms can restrict girls' life choices and exclude them from educational, social and economic opportunities (UNICEF, 2020). According to Masuku and Lan (2014), nutritional knowledge and attitudes are important factors of dietary practices and are important contributors for appropriate planning of nutrition care programs for vulnerable people living with HIV like pregnant and lactating mothers (Masuku & Lan, 2014). Nutrition of adolescent girls (AG's) between ages 10 – 19 years is important during this growth stage of the development cycle. Generally, this age bracket receives little health and nutrition attention other than information on reproductive health issues (Christian & Smith, 2018). Adolescents' food choices are predominately a result of parental control mechanisms which may change overtime therefore influencing their food decision making on various occasions (Ziegler et al., 2021). Therefore, it is important to understand that adolescents sometimes do not have control on food choice and preparation since it also relies on what the caregiver has purchased or prepared.

Inadequacy of energy and/or nutrients can cause nutritional deficiencies, delay physical growth and even stop or delay sexual maturation. In addition, adolescent girls living with HIV are nutritionally vulnerable because of the additional demands imposed by the HIV virus and opportunistic infections. These vulnerabilities can compromise their immune status and subsequent infections leaving them at a risk



of excess nutrient loss and malabsorption (National Food & Nutrition Commission, 2020). Adolescents living with HIV are also at risk of under-nutrition. Therefore, it is important for them to get social support, avoid meal skipping, disclose HIV status as well as treat and prevent opportunistic infections (Shiferaw & Gebremedhin, 2020). This evidence suggests that the study of adolescents KAP and self-efficacy is important in order for adolescents living with HIV to enjoy longevity of life.

#### **2.4 Adolescents adherence clubs**

An adherence club also known as a teen club, is a peer support group and information sharing forum for children and adolescents living with HIV. Adherence clubs are a very vital tool to provide a safe, welcoming, and nurturing environment for children living with HIV to build strong relationships, increase self-esteem and reinforce good habits (MOH& Baylor College of Medicine, 2017). A study conducted by Munyayi & Wyk (2020) reveals that an HIV adherence club is effective for adolescents living with HIV accessing ART at a specialised adolescent-friendly ART clinic. Similarly, a study in Malawi revealed that teen clubs improve adherence to ART among infected adolescents maintaining an adherence club requires dedicated time, peer mentorship, ART refill, and additional treatment support to improve general treatment (Mcbride et al., 2019, p. 2629).

Teen clubs are a model which has been adopted globally to ensure excellence in provision of care and support of HIV positive adolescents. An adherence club is conducted at the health facility level and usually conducted once every Saturday morning using games and lessons from a designated teen club manual (UNICEF, 2018). A focal person who is a health facility clinician is also selected and appointed to provide technical support and overall coordination of activities in the club. In some instances, a peer educator is also engaged to provide peer support and coordinate adherence club meetings. In order to become an adherence club member, the adolescent should be living with HIV with ages from eight (8) years old to eighteen (18) years old. All participants are expected to know their HIV status and receive parental or caregiver consent in order to participate in the club (MOH,

2017). Moreover, the club participants should be receiving HIV care at an affiliated health facility (UNICEF, 2018).

## **2.5 The relationship between nutrition knowledge and socio-demographic aspects**

Consuming a healthy diet and having access to a nutritious supply of food is important to good health, as good nutrition is a key factor in the overall health and wellbeing of humans. Socio-demographic factors which include economic status, education, age, sex, location, and degree of urbanization play a fundamental role in nutrition (Irala-Estevez et al., 2000, p.708). Evidence suggests that people with a high socioeconomic status (SES) are more likely to have healthier food habits since they have the financial resources to cater for the cost of healthy food. Moreover, evidence reveals that people with low SES have dietary profiles which are less consistent with nutritional recommendations or dietary guidelines, this contributes to their poor health status and overall food affordability (Alkerwi et al., 2015, p.1). Therefore, even though nutrition knowledge levels are high among adolescents living with HIV, resources constraints due to poverty and affordability of the foods remain a challenge for them to put knowledge into practice.

Literature reveals that in areas with abundant food choices such as western societies, nutrition knowledge is needed as oftentimes food consumption is not in line with dietary recommendations, therefore a certain level of knowledge is needed to make healthy food choice, availability of the food as well as competing priorities such as desirability of the food, taste etc. A study conducted by Sireesha, Rajani, and Bindu (2017, p.493) revealed that although teenagers were well informed on nutrition i.e., had the knowledge, the majority of them preferred fast foods and regularly consumed junk food as it was easily accessible, low cost, tasty and convenient.

Age and education play a significant role in nutrition knowledge because there is an assumption that education coupled with increased age brings about exposure and awareness. Hendrie, Coveney and Cox (2008, p.1365) found that nutrition knowledge increase with age and with an increasing level of formal education. A study conducted by Koch, Hoffmann and Claupein, (2021, p.5) confirmed that

nutrition knowledge was higher in groups and with higher education, However, they also found that nutrition knowledge is higher in younger age groups. A study by the USDA's Economic Research Service shows that the more mothers know about food and nutrition, the better the quality of their children's diets, especially younger children's diets (Variyam et al., 1999, p.14). These findings show that mother's knowledge on food and nutrition contributes positively towards shaping their children's nutrition knowledge especially on children with good education background.

Economically deprived individuals often have inadequate nutrient intakes that may be related to the types of food consumed (Cunha et al., 2011, p.1579). Onyango (2003) found that although most food groups were consumed by adolescents, only a few foods from each group were included in the diet, suggesting a monotonous diet that is associated with poverty and poor nutrition.

### **2.5 Nutrition knowledge and attitudes of adolescent girls living with HIV/AIDS**

Nutrition is an important element in the care and treatment of people living with HIV, especially when combined with ART for supporting health and maintaining quality of life (Willing, et al., 2018, p.488). A study conducted in Uganda shows that food and nutrition security is fundamentally important for the prevention, care, treatment, and mitigation of HIV/AIDS (Bukusuba et al., 2010, p.185) as it is linked to the immune function (Bukusuba et al., 2010, p.186). The World Health Organisation (2014) states that adequate nutrition cannot cure HIV, however it is important for maintaining healthy levels of physical activity and for optimal quality of life. Moreover, adolescents receive little health and nutrition attention other than information on reproductive health issues (Christian and Smith, 2018).

Addressing gaps in nutrition knowledge among people living with HIV is essential because nutrition plays a vital role in the care and management of HIV. Shapu (2020, p.14) reported that a majority of adolescent girls in Nigeria had poor information, knowledge and attitudes, motivation, and behavioural skills towards reducing malnutrition. Additionally, Whaling et al., (2012, p.36) attests that nutrition attitudes and perceptions among people living with HIV had an influence

on their nutrition. This emphasises that nutritional knowledge and attitudes are important factors of dietary practices and are important contributors for the appropriate planning of nutrition care programmes for vulnerable people living with HIV (Masuku and Lan, 2014, p.261).

The adolescence stage is a time whereby adolescents gain influences in food choice behaviour and attitude. Their eating patterns are influenced by variety of factors such as media, socioeconomic status, peers, family and personal nutritional knowledge. Evidence shows that there is a strong correlation between nutritional knowledge of adolescents and their eating habits. Moreover, a positive association between higher levels of nutritional knowledge and healthier eating habits including eating more fruits, vegetables breakfast and healthy snacks (Al-Yateem & Rossiter, 2017, p 551). A study conducted by Sharma et al. (2019) also revealed that there is an inter relation between nutrition knowledge, attitude and self-efficacy scores and the scores obtained in this study proved the above variables are determinants of dietary behaviour among adolescents.

## **2.6 Nutrition practices for adolescent girls living with HIV/AIDS**

Nutrition is the biochemical and physiological process by which an organism uses food to support life. It includes ingestion, absorption, assimilation, biosynthesis, catabolism, and excretion (FAO, 2014). Adequate nutrition at this stage is important as it plays an integral part in their growth and development. Therefore, adolescents require adequate nutrition intake and utilization of enough energy and nutrients together with disease control to maintain adolescents' health and productivity (Raiten et al., 2001, p.1668).

Adolescent girls living with HIV are nutritionally vulnerable because of the additional demands imposed by the virus and opportunistic infections. These vulnerabilities can compromise their immune status and subsequent infections leaving them at risk of excess nutrient loss and mal-absorption (MOH, 2017). Additionally, nutritional alterations, such as weight loss and protein depletion are common in HIV infection, ultimately leading to malnutrition. On the other hand, poor nutrition results in a weakened immune system and, thus, predisposes an

individual to opportunistic infections and enhanced progression of HIV to acquired immunodeficiency syndrome (AIDS) (Masuku & Lan, 2014, p.261).

The growth spurt in adolescence requires rapid tissue expansion with special nutrient requirements, including amino acids for the growth of striated muscle, as well as calcium and vitamin D to accommodate bone growth. Energy and nutrition requirements must match the needs of the adolescents as they typically engage in physical work or recreational exercise, which benefits striated muscle mass enlargement. Appetite increases during adolescence, and inactive individuals are more likely to accumulate fat if they have access to high-energy food. According to Masuku and Lan (2014, p.260), nutritional knowledge and attitudes should be considered as part of planning of nutrition care programmes for vulnerable people living with HIV.

Adequate knowledge, attitudes, and practices on nutrition among HIV adolescent girls greatly impact their nutritional choices. Having the necessary knowledge helps one to understand different important aspects of food and predict nutrition outcomes for oneself health occurrences. According to Saeidiou et al. (2016) high nutrition knowledge is associated with better practice and diet quality which is also influenced by nutrition education and household training at family level. Continuous re-enforcement of nutrition messages is important to ensure nutritional self-efficacy which reflects on the adolescents to make better food decisions relating to their nutrition.

Good nutritional status has been shown to be associated with higher health status in persons living with HIV. It is therefore important that adolescents with HIV maintain a balanced diet that includes a variety of staple carbohydrates, sugars, fats and oils, dietary fibre, proteins, and vitamin- and mineral-rich vegetables and fruit (National Food and Nutrition Commission, 2017, p.4). Adolescents are mostly characterized by dietary patterns that include skipping meals, frequent snacking and high intake of fast foods (Brown R et al., 2021, p.2044). Most adolescents tend to prefer eating fast food and junk rather than nutritional home cooked meals. In school going adolescents prefer being given money than carrying home packed lunch. They are often given money than packed lunch, so they tend to grab

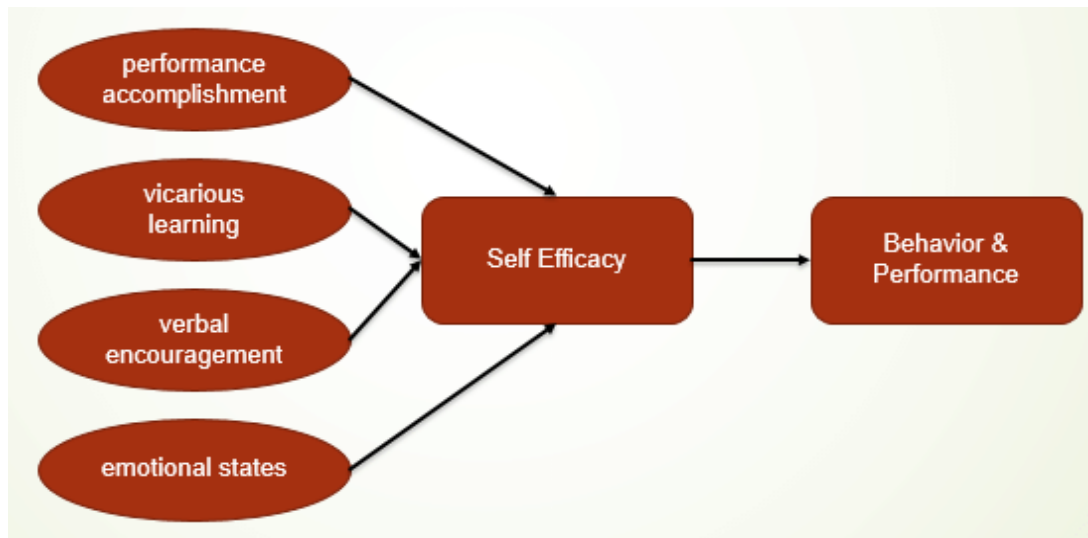
something affordable and readily available which in most cases is not of nutritional benefit (Sireesha Ranjani & Bindu, 2017, p.491).

In Eswatini, most government schools have feeding schemes so some of these children rely on that meal especially adolescents from financially disadvantaged homes. Most of these children are not spoiled for choice so they rely on what the school offers, mainly being beans and mealie-meal porridge, which is mostly not prepared by them. Moreover, at home adolescents are not the ones that purchase food commodities and, in some cases, they are not involved in meal planning and preparation.

## **2.7 Nutrition self-efficacy**

Self-efficacy is a construct first introduced by Albert Bandura in 1977 and is generally defined as the belief in one's capabilities to achieve a goal or an outcome (Bandura, 1997). Self-efficacy as a concept further provides the foundation of human motivation, well-being, and personal accomplishment and also depends on the dynamic interaction among psychological, physiological, and environmental influences. Nutritional self-efficacy refers to an individual's thought patterns and emotional reactions towards their food consumption (Bandura, 1997). Accomplishment of specific tasks or outcomes, indirect or derivative learning through the observation of experiences by others, positive verbal feedback and the associated emotions contributes to self-efficacy (See Figure 2.1). Self-efficacy has been used to modify behaviour or intervene in certain behaviours, especially in studies of dietary behaviour changes, and is generally accepted as a helpful process indicator (Nothwehr, 2008, p.260)

Self-efficacy is crucial in understanding and modifying health behaviours and, more specifically, eating behaviours (Efthymiou et al., 2022, p.97). Adolescents can use their self-efficacy to help sustain and maintain their lifestyle modification of physical activity and healthy eating as a means to maintain a healthy weight (Becher, 2009).



*Figure 2.1: Diagrammatic illustration of the theory of self-efficacy as quoted by Rimer and Glanz, 2005 from Albert Bandura, 1997*

The concept of nutrition self-efficacy allows adolescents living with HIV to assess how well able they are to prepare nutritionally balanced meals that support their daily nutritional requirements, hygiene practices, and food choice as well as ensuring support of their adherence to their ART medication. According to Al Ghanim and Alkazemi (2021), there is a significant correlation between self-efficacy and perceived barriers to healthy eating. The results of the study reveal that nutrition self-efficacy is influenced by a variety of factors such as attitudes towards health, awareness regarding healthy food, perceived behavioural control, and peer concerns. When these factors are well strengthened, positive attitudes, behaviours and practices can be achieved.

## **2.8 Theoretical framework**

The study was framed by the Theory of Planned Behaviour (TPB) and Theory of Reasoned Action (TRA) (see Figure 2.2). These theories explore the relationship between behaviour and beliefs, attitudes and intentions. They assume that behavioural intention is the most contributory factor of the behaviour and the intentions led to attitude towards that behaviour, subjective norm, or perceived behavioural control. This study has used the Theory of Planned Behaviour (TPB), to assist in predicting the intention of adolescent nutritional behaviours by looking at the three concepts, namely: (1) attitudes, (2) subjective norms, and (3) perceived

behavioural control (Rimer & Glanz, 2005, p.44). Attitudes were also evaluated through the adolescent girl's behaviour and subjective norms through understanding beliefs about whether key people approve or disapprove of the behaviour and their motivation to comply with that behaviour. Lastly, perceived behavioural control looked at the belief that an adolescent girl has the ability to exercise control over their nutrition practices (Rimer & Glanz, 2005, p.49).

The theory of planned behaviour and the theory of reasoned behaviour is based on the premise that individuals make logical, reasoned decisions to engage in specific behaviours by evaluating the information available to them. Furthermore, it highlights that the performance of a behaviour is determined by the individuals' intention to engage in it which is influenced by the value the individual places on the behaviour, the ease with which it can be performed, the views of significant others and the perception that the behaviour is within his/her control (Ryan & Carr, 2010). Therefore, this suggests that an individual's behaviour is determined by their intention to engage in the behaviour and the views that the behaviour is within their control. In this study the individual behaviour i.e. the nutrition knowledge, attitudes, and practices of adolescent girls with HIV is informed by their intention (based on their knowledge) and their views on behaviour (i.e., attitudes).

The Theory of Planned Behaviour suggests that the likelihood of an individual engaging in health behaviour is correlated with the strength of his or her intention to engage in the behaviour. Thus said, a behavioural intention represents an individual's commitment to act and is itself the outcome of a combination of several variables (Kagee & Freeman, 2017). In this study, these variables included nutrition knowledge, attitudes, and practices of adolescent girls with HIV. The Theory of Planned Behaviour and Theory of Reasoned Behaviour further suggests that behaviour is not only determined by intentions and attitudes, but it is also determined by subjective norms. The construct of subjective norms refers specifically to how others whom we care about feel about us engaging in a particular behaviour (Neighbours, Foster & Fossos, 2013, p.323). According to these theories, if one believes that the important people in their life were concerned about their health, they are more likely to incorporate good nutritional practices.



Conner (2001) is of the view that the theory of planned behaviour and theory of reasoned action explain how influences affect an individual which then determines that individual's decision to follow a certain behaviour. The theory of planned behaviour serves as an umbrella for the determinants of behaviour which are the intentions to engage in that behaviour and the perceived behavioural control over that behaviour (Mimiaga & Safren, 2009, p.340). Therefore, this emphasises that the intentions to engage in a particular behaviour and the control that individual has over the behaviour will impact the decision to engage in that behaviour. These two theories are the most suitable theories to study the adolescents KAP and self-efficacy since the constructs look at each of the variables uniquely.

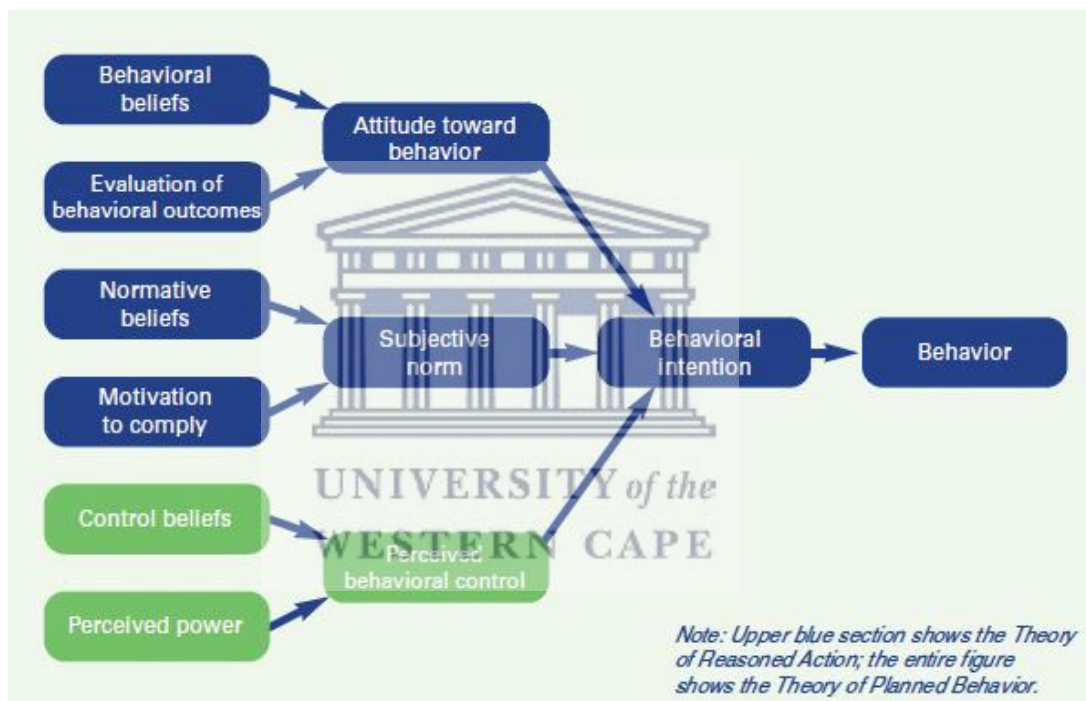


Figure 2.2: Diagrammatic illustration of the theory of planned behaviour  
(Source: Rimer and Glanz, 2005 p.34)

## 2.10 Conclusion

This chapter focused on the review of literature for all the studied variables of which were socio-demographic, nutritional knowledge, attitudes, practices and self - efficacy. This process has shown the desk review of findings of other researchers on the nutritional knowledge, attitudes, practices and self-efficacy from other researchers.

## CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

### 3.1 Introduction

This chapter presents a layout of how the research study was conducted, specifying the research activities and procedures that were embarked on during the study. This chapter will give a comprehensive detail of the research design and methodology adopted, stating the validation and justification for its use including how the information was collected and evaluated.

### 3.2 Research Design

The study adopted a descriptive cross-sectional survey design, collecting all variables of interest at one fixed point in time (Ihudiebube & Chikeme, 2020). This type of study uses observational methods to allow the investigator to measure outcomes and exposure at the same time (Dermatol, 2016, p.261).

Given the research questions, a quantitative research strategy was adopted. The quantitative approach collects data using study instruments on a required number of participants to draw inferences about the population from which the sample is taken. The data is then analysed using statistical procedures based on the distribution of the independent variable and co-variates (Creswell, 2014, p.14).

### 3.3 Population and sampling

The Manzini region consists of 105 health facilities, and the target population for this study draws from these facilities. A total of 2685 adolescents living with HIV are found in the hundred and five adolescent adherence club in the Manzini region (MOH, 2018). Using convenience sampling, six health facilities (see Table 3.1), located in rural and urban settings in the Manzini region were selected for data collection. The selection of the six health facilities was based on the availability of adolescent ART adherence clubs at the facility, as well as total number of adolescents registered with the clubs. To maximize on the sample size, facilities with high volume of adolescent girls living with HIV were selected, a total of three (3) from urban and three (3) from rural areas were selected.

At each facility, all adolescent adherence clubs were eligible for participation. Typically, adherence clubs meet once every Saturday of the month and this does not vary by facility. All adolescent girls aged between 10-19 years, attending the adherence club were invited to participate in the study. For a period of nine weeks from the 18<sup>th</sup> of September 2021 to the 13<sup>th</sup> of November 2021, adolescent girls eligible to participate were interviewed at each facility on the Saturdays: September 18<sup>th</sup> and 25<sup>th</sup>, October 2<sup>nd</sup>, 9<sup>th</sup>, 16<sup>th</sup>, 23<sup>th</sup>, and November 6<sup>th</sup> and 13<sup>th</sup>. The study interview occurred after all the adherence club activities had been concluded.

**Table 3.1 Population and selected samples for health facilities**

Name of Clinic	Number of ART clubs	Number of beneficiaries	Rural or Urban
Mafutseni Clinic	1	69	Rural
Good Shepherd Clinic	2	81	Urban
Mbikwakhe Clinic	1	74	Rural
Baylor Clinic	3	138	Urban
Nazarene Clinic	2	98	Urban
Cabrini Ministries	3	141	Rural
<b>Total</b>	<b>12</b>	<b>601</b>	

Sample Size:

Preliminary analysis shows that 233 adolescent girls of ages 10-19 years who were attending adherence clubs in the six selected health facilities were involved in this study. The required sample size was calculated on the expected proportion of adolescents to have adequate nutrition knowledge (40%), a confidence level of 95%, and desired an acceptable margin of error of 5%. As calculated through Epi info, the sample required was 384.

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2}$$

$$n = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} = 384.16$$

where

**z** is the z score

**ε** is the margin of error

**N** is the population size

**p̂** is the population proportion

### **3.4 Reliability and Validity measures**

The questionnaire was reviewed by two panel of experts: the supervisor and co-supervisor of the study. Reliability refers to the consistent measure of responses of the same questions in the same population (Price et al, 2015, p.116). Reliability indicates how consistently a method can be used over time under the same circumstances. Validity is a means of checking the accuracy of the findings Creswell (2014, p.201). This study used Cronbach's Alpha to measure the reliability and two panel of experts who included the supervisor and Co-supervisor of the study reviewed the questionnaire for validity. An internal reliability coefficient of 0.794 was established from 20 questionnaires (Cronbach's Alpha).

### **3.5 Piloting**

Prior to use of the questionnaires, it was distributed for review to non-participants of the intended survey. Using the preferred language choice, Siswati or English, adolescent girls from an adherence club in the Hhohho region were requested to complete the questionnaire as a pre-test procedure. The comments and questions asked by adolescent girls were used to amend the final questionnaire. Most of the questions during the piloting exercise were well understood by the adolescent girls. Only corrections related to Siswati language translations were picked up, where more youth friendly and modern Siswati had to be used instead of deep-rooted Siswati. This included wrong phrasing of sentences and spellings, and these were corrected before data collection started.

### **3.4 Data collection tool**

A structured and paper-based questionnaire was used as a data collection tool (see Appendix A). The questionnaire in this study began with clear and easy instructions on how to fill in the answers, followed by a division of the questionnaire into five sections. The first part consisted of questions aimed at accessing the socio-demographic information of the respondents. The second and third parts focused on examining the knowledge and attitudes of respondents. The fourth part was aimed at determining self-efficacy among adolescent girls living with HIV. The questionnaire was bi-lingual with English and Siswati versions which the adolescents chose according to their preference.

The study adapted the majority of the nutritional knowledge, attitude, and practices questions from the eSwatini based study by Masuku and Lan (2014), assessing nutritional knowledge, attitude, and practices among pregnant and lactating women living with HIV in Eswatini. In the study by Masuku and Lan (2014), the questionnaire was developed and validated by using a questionnaire which was adapted from Action Against Hunger, a non-governmental organization in partnership with Swaziland (eSwatini) National Nutrition Council (Masuku & Lan; 2014). It was pre-tested with 20 HIV-positive pregnant and lactating women and then data was collected with 324 women. The study questionnaire was also informed by the study conducted by Sireesha, Ranjani and Bindu (2017) examining nutritional knowledge, attitudes, and practices among adolescents' nutrition in India. With respect to nutritional self-efficacy questions, all questions were derived from a Self-efficacy study among adolescents ages 12–19 years in the Netherlands by Peter Muris (2001).

#### **3.4.1 Nutritional knowledge assessment**

In this study, the nutritional knowledge-related question tool comprised of 11 questions, each scored at a value of 1 for the correct answer [Table 3.2]. The nature of the nutritional knowledge questions covered knowledge on energy giving food, proteins substitutions, vitamins and minerals as well as hygiene. From the study by Masuku and Lan (2017), six of the twelve questions were adapted (questions 1, 2, 4, 7, 8 & 9). The other six questions were excluded in Masuku and Lan (2017), because they were more related to pregnant and lactating mothers. Instead, the other five (5) new questions added in the data tool were assessing hygiene and nutrient replacement in food, these were adapted from the Sireesha, Ranjani and Bindu's (2017) study (Table 3.2 questions 3, 5, 6, 10 & 11).

According to Casadei and Albert (2016), poor hygiene and food preparation can cause human illness, and therefore knowledge of food handling and food preparation is crucial. As these three questions had not been used together before, language consideration and understanding during the piloting process were important. Structured feedback questions were asked to adolescents to assess if they

understood the questions. A few minor corrections were made, particularly to translating to the Siswati language.

For each question, three response options were provided: True, False and Do not know [Table 3.2]. The correct answer (True or False) was assigned a value of 1 and an incorrect answer (which would either be True/False or Do not know) was assigned a value of 0. This provided a maximum total score of 11 and a minimum total score of 0. The nutritional knowledge questionnaire showed good validity with 324 participants in the study by Masuku and Lan (2017), with a Cronbach's alpha coefficient of 0.81. A column of the correct answers is shared on the questionnaire sample below.

**Table 3.2 Nutritional Knowledge assessment**

No	Question	True (T)	False (F)	Do not know (N)	Correct Answer
1	I can eat maize as my energy food				T
2	Nutrients (protein, carbohydrates, vitamins and minerals) cannot be provided by one kind of food				T
3	I can replace rice with bread				T
4	Vegetables and fruits are sources of vitamins and minerals				T
5	If I eat cheap fruits, I get less vitamins				F
6	When I do not eat animal protein, I can replace it with plant protein				T
7	High fibre food is dangerous for people living with HIV				F
8	HIV is a result of poor nutrition				F
9	Antioxidants are poisonous for People Living HIV				F
10	It is important to wash my hands with soap and water to prevent infectious diseases				T
11	It is important for me to eat healthy foods everyday				T

True[T] False[F] Do not know[N]

### **3.4.2 Nutritional attitudes assessment**

The nutritional attitude tool included 13 questions, on food choice, food preparation, keeping the body healthy, and good hygiene attitudes [Table 3.3]. Six questions were adapted from Masuku and Lan's 2017 study and seven questions on nutrient replacement and hygiene were adapted from Siressha et al 2017 study. From the tool used by Masuku and Lan (2017, three questions (1,4&5) were excluded on since they were more related to pregnant and lactating mothers whilst Siressha, Ranjani & Bindu (2017) questions (2,6,7,8,9,10,11,12 &13) were added since they assessed nutrient replacement and hygiene.

Unlike the nutritional knowledge assessment, responses on attitudes were provided using a 5-point Likert scale with the five-point ranging from: strongly agree [value of 1], to agree [value of 2], neither agree or disagree [value of 3, disagree [value of 4] and strongly disagree [value of 5]. The Likert scale is considered an effective tool that can be used in questionnaires because it has high reliability and successful adaptation to measure many types of characters (Leedy & Ormrod, 2015, p.161). Masuku and Lan's (2017) questionnaire showed good validity, with a Cronbach's alpha coefficient of 0.75 using 324 participants. The researcher also piloted the questions and the adolescents understood the questions.

Positive nutritional attitudes were assigned a value of 1 and negative nutritional attitudes were assigned a value of 0. For negatively phrased questions (i.e., It is not important to eat a balanced meal when already on ART), these were recorded and allocated scores accordingly (0=most negative attitude, 1=most positive attitude). Neither agree or disagree was assigned was always assigned a 0. A maximum total score for the assessment was 13 with a minimum total score as 0. A column of the correct answers is shared on the questionnaire sample below.

**Table 3.3 Nutritional Attitude Assesment**

No	Questions	SD	D	N	A	SA	Positive attitude
1	Preparing a balanced meal is time consuming						SD+D
2	I need to eat a variety of foods so that my body gets all nutrients						SA + A
3	Healthy food is more expensive than unhealthy food						SD +D
4	It is not important to eat a balanced meal when already on ART						SA+A
5	A nutritious meal can come from one's own home backyard garden						SA +A
6	Vegetables are very important to keep the body healthy and fit						SA+A
7	I must over cook vegetables to kill microbes						SD+D
8	Animal protein is better than vegetable protein						SD+D
9	Hygiene is as important as food and nutrition						SA+A
10	I drink water at least 8 glasses (or 2L) of water per day						SA+A
12	Cutting and cleaning nails is a healthy behaviour						SA+A
13	Ideal body weight can be achieved by application of a balanced diet in everyday						SA+A

Strongly Disagree [SD]- 1, Disagree [D] -2, Neutral [N]-3, Agree [A]-4 Strongly Agree [SA] - 5

### 3.4.3 Nutritional practices assessment

The nutritional practices tool included three (3) questions adapted from Masuku and Lan and six questions adapted from Sireesha et al 2017 study [Table 3.4]. The nutritional knowledge questionnaire showed good validity in the study by Masuku and Lan (2017), with a Cronbach's alpha coefficient of 0.82. Due to the changes of the questionnaire, a pilot was conducted and the adolescents understood the



questionnaire. Corrections made were related to native language translations to Siswati.

Similar to the nutritional attitude questions, the responses were provided using a 5-point Likert scale with the five-point format: strongly agree [value of 1], agree [value of 2], neither agree or disagree [value of 3], disagree [value of 4] and strongly disagree [value of 5]. The nutritional practice that was most favoured was assigned 1, be it strongly or not. Neither agree or disagree was assigned 0. Nutritional practices that were undesirable were assigned a value of 0 as well. The maximum total score was 9 with a minimum total score of 0. A column of the correct answers is shared on the questionnaire sample below.

**Table 3.4 Nutritional Practice Assessment**

Questions	SA	D	N	A	SA	Correct answer
1. Every meal I eat needs to have a vegetable						SA+A
2. I need to consume coloured fruits						SA+A
3. Every meal needs to have a fruit and juice						SD+D
4. I eat snacks and junk foods at school						SD+D
5. I eat healthy to maintain a good immune system						SA+A
6. I cook all my meats using deep fat frying method						SD+D
7. I need to bath with soap and water						SA+A
8. I take a balanced meal before taking my ARV's						SA+A
9. I wash my hands with water and soap before and after eating food						SA+A

Strongly Disagree [SD]- 1, Disagree [D] -2, Neutral [N]-3, Agree [A]-4 Strongly Agree [SA] - 5

### 3.4.4 Nutritional self-efficacy assessment

The nutrition self-efficacy tool included 9 questions, based on a study conducted by Peter Muris (2001) in the Netherlands on Self-efficacy in youth between the ages 12 -19 years old. For the study, language from Peter Muris (2001) was used to develop the best framing of nutritional self-efficacy questions relevant to the research question. The questions on nutritional self-efficacy focused on food choice, food preparation, keeping a healthy body and good hygiene. The pilot process for this study provided an opportunity to test these questions with 20 adolescents, ensuring the appropriate language was used. The adolescents understood the questions during piloting and only a few corrections were made, largely for the Siswati questionnaire translation.

For each question, responses were recorded using a 5-point Likert scale ranging from a score of 1- strongly agree to the score of 5 strongly disagree. The desired nutritional self-efficacy was assigned 1 be it strongly or not. Neither agree or disagree was always assigned a value of 0. Nutritional self-efficacy that was undesirable was assigned a value of 0. The maximum total score was 9 with a minimum total of score of 0.

**Table 3.5 Nutritional Self -efficacy Assessment**

Question	SD	D	N	A	SA	Correct answer
1.I am well able to frequently prepare a balanced meal						SA+A
2. I am well able to make a balance food choice from a variety of food products						SA+A
3. I am well able to shop affordable healthy food						SA+A
4. I am well able to share good nutrition knowledge with my peers						SA+A
5. I am well able to drink at least 2L of water per day						SA+A
6. I am well able to exercise at least once a week						SA+A
7. I am well able to monitor my weight						SA+A

<b>Table 3.5 Nutritional Self -efficacy Assessment</b>						
8. I am well able to wash my hands with soap water before and after eating						<b>SA+A</b>
9. I am well able to practice good personal hygiene including cutting of my nails						<b>SA+A</b>

Strongly Disagree [SD]- 1, Disagree [D] -2, Neutral [N]-3, Agree [A]-4 Strongly Agree [SA] - 5

### **3.7 Data collection procedures**

The data was collected through field self-administered structured questionnaire, with the researcher available to review completeness of the questionnaire at the end. The selected adherence club facilities are led by facilitators. Hence, appointments were made with club facilitators to get permission for conducting the study. Teen club facilitators were requested to share a brief on the study to the adolescents and further handover information sheets and parental consent forms to the adolescents to take home to their caregiver for consent. The parental consent forms were taken-home and discussed before date of data collection.

At the next adherence club meeting, introduction was given by the researcher to the club facilitators followed by an explanation of the study whilst giving details on the reasons and its benefits. This was done at the end of the teen club session. Once participants were consented and parental form submitted, the researcher gave a brief introduction of the study to the girls. The researcher then led the participants through the information sheet, ethical clarifications, and explanations of the questionnaire response. All respondents were provided with the same questionnaire which was either in English or Siswati to complete on their own. Upon completion of the questionnaires, the researcher engaged with respondents and checked if there were any questions missed. Adolescents who were above 19 years old and below 10 were excluded in the study.

### **3.8 Data analysis and presentation**

Data was captured and coded into an Excel spreadsheet; it was then analysed using the IBM Statistical Package of Social Sciences version (SPSS) 27. After entering

the data on Excel sheets, the data was cleaned for duplicates and incomplete data to avoid interference with the analysis. The income variable was removed due to too many missing responses that respondents were not comfortable responding to.

Descriptive statistics are presented in tables and include central tendency measures such as the mean and median for continuous data. For non-continuous data, frequencies are used to describe the study participants. Comparisons were done for younger adolescents [10-14 years] vs older adolescents [15-19 years] throughout the analysis. The nutritional variables scores were further divided into four grading levels: <50% for poor, 50-69% for average, 70-80% for good and >80% for excellent [Table 3.6]. Bivariate analyses were done using spearman's correlation for continuous variables and the chi-squared test for categorical variables to explore the association between KAP and self-efficacy against socio-demographic variables.

**Table 3.6 Classification of nutrition KAP and Self-efficacy percent scores.**

<b>Classification</b>	<b>Knowledge [Max=11]</b>	<b>Attitude [Max=13]</b>	<b>Practice [Max=9]</b>	<b>Self-Efficacy [Max=9]</b>
Poor (<50%)	4	2-5	0-4	0-4
Average (50%-69%)	5-6	6-8	5-6	5-6
Good (70%-80%)	7-8	9-10	7	7
Excellent (>80%)	9-11	11-13	8-9	8-9

### **3.9 Ethical considerations**

The approval for the study was obtained from the Biomedical Research Ethics Committee of the University of the Western Cape (Reference number BM21/4/11) (see Appendix B) and the National Health Research Review Board (NHRRB) of the Ministry of Health in the Kingdom of Eswatini (Reference number

EHRRBO503/2021) (see Appendix C). These two ethics clearance letters were used to obtain permission to collect data in the six targeted health facilities. The facilities were sent an email with the request for data collection and followed up with phone calls. All six health facilities were provided with permission for the researcher to proceed with data collection (Appendix D). A structured questionnaire was designed to collect the data which was interpreted into two languages English and Siswati.

A consent form for parents/guardians was sent home with the adolescent girls to obtain consent from the parent/guardian before the next meeting. Additionally, consent was sought from each respondent before the completion of the questionnaire. The parents/guardians as well as the adolescents were notified of their rights and the risks and benefits of participating in this study (See Appendix E: Information Sheet, Appendix F: Consent Form and Appendix G Assent Form). They were also assured that participation in the study was voluntary and that they would remain anonymous as no names will be entered on the questionnaire. Adolescents were assured that they would not lose any privileges or benefits due to them, should they choose not to participate and were assured that participation in the survey had a very low risk of harm. Confidentiality was assured by a collection of anonymous data, hard copy questionnaires were sealed in a box and stored in a locked cabinet whilst soft copy data was stored in a password-protected computer.

### **3.10 Conclusion**

This chapter focused on the study methodology which includes design, population sampling, data collection analysis, and ethical clearance. These processes have enabled data presentation which will be discussed in the following chapter.

## CHAPTER 4: PRESENTATION OF FINDINGS

### 4.1 Introduction

This chapter presents findings from the questionnaire responses from adolescent girls living with HIV from six (6) health facilities adherence clubs in the Manzini region in the Kingdom of Eswatini, which address the study's objectives. The Statistical Package for the Social Sciences (SPSS version 27) was used to code and analyse the quantitative data.

### 4.2 Response rate analysis

A paper-based questionnaire (see Appendix A) was administered to a sample of 264 adolescent girls living with HIV, and a total of 233 questionnaires (88%) were returned. The socio-demographic variable on household head monthly income was excluded in the analysis since a high number (n= 132, 57%) of adolescent girls did not know their household head monthly income.

### 4.3 Socio-demographic characteristics of respondents

The socio-demographic characteristics of the respondents are presented in Table 4.1. The findings show that majority of the respondents, (66%, n=154), were between the ages of 15-19 years old and the remaining few (34%, n=79) were between the ages 10 -14 years. About 64% (n=130) were from urban health facilities and 63% (n=148) were attending secondary/high school level of education. Nearly 30% (n= 71) were still attending primary school level, whilst a small proportion were attending tertiary education (2.1%, n=5) or undergoing informal education (0.9%, n=2).

With respect to income of caregivers, the majority of the adolescent girls received household food provision from their biological parents (78%, n=181), then followed by siblings (9.9%, n= 7) and then by guardians (7.3%, n=17). One participant reported having a neighbour as their main food provider. For source of income, the most common source of household income was a salary (54.9%, n=128), whilst the second highest source of income was having a small business with (30.9%, n=72). This was then followed by a social grant with (6.0%, n=14), whilst (5.2%, n=12) of the participants source of income came from pension benefits. A small proportion had income source listed as other means (3%, n=7). These results are illustrated in the table 4.1 below:

**Table 4.1: Socio-demographic characteristics of adolescent girls by age groups.**

Variable		10-14 years (79, 34%)	15-19 years (154,66%)	Total
Location	Urban	34 (43%)	96 (62%)	130 (56%)
	Rural	45 (57 %)	58 (38%)	103 (44%)
Total		79 (33.91%)	154 (66.09%)	233 (100%)
Education	None	4 (5%)	3 (4%)	7 (4.1%)
	Primary	51 (65%)	20 (13%)	71 (30%)
	Secondary	23 (29%)	125 (81%)	148 (68%)
	Informal	1 (1%)	1 (1%)	2 (0.9%)
	Tertiary	0 (0%)	5 (5%)	5 (2.1%)
Who provides food in the family	Parents	61 (77%)	120 (78%)	181 (78%)
	Guardians	5 (6%)	12 (8%)	17 (7%)
	Myself	0 (0%)	4 (3%)	4 (2%)
	Neighbour	0 (0%)	1 (0.0%)	1 (0.4%)
	Sibling	12 (15%)	11 (7%)	23 (10%)
	Other	1 (1%)	6 (4%)	7 (3.0%)
Source of income	Pension	1 (1%)	11 (7%)	12 (5%)
	Salary	45 (57%)	83 (54%)	128 (55%)
	Small business	27 (34%)	45 (29%)	72 (31%)
	Social grants	6 (8%)	8 (5%)	14 (6.0%)
	Other	0(0%)	7 (5%)	7 (6%)
Health Facility adherence club	Baylor	6 (8%)	47 (31%)	53 (23%)
	Cabrini	18 (23%)	25 (16%)	43 (18%)
	Good Shepherd	20 (25%)	27 (18%)	47 (20%)
	Mafutseni	12 (15%)	19 (12%)	31 (13%)
	Mbikwakhe	15 (19%)	14 (9%)	29 (12%)
	Nazarene	8 (10%)	22 (14%)	30 (13%)

The highest volume of adolescent respondents 23% (n=53) came from Baylor Clinic, followed by Good Shepherd with 20.2% (n= 47) of adolescents, Cabrini Hospital had (18.5%, n= 43) of

adolescents, Mafutseni with 13.3% (n=31) of adolescents, and Nazarene Clinic with 12.9% (n=30) of adolescents, and lastly Mbikwakhe Clinic had 12.4% (n=29) of adolescents. A total proportion of 38.6% (n=90) adolescent respondents attended rural facilities and 61.4% (n=143) adolescents respondents attended from urban health facilities.

There was no difference in the distribution of income source and the person who provides food between younger adolescent girls (ages 10-14) and older adolescent girls (15-19 years). However, older girls 15-19 years were more likely to come from an urban clinic, 62% (n=96), mainly from Baylor clinic. On the other hand, young girls were more likely to be from a rural clinic, namely Cabrini and Good Shepherd. As expected, majority of younger girls 10 -14 years were enrolled in primary education 65%(n=51) whilst the majority of older girls 15-19 years were enrolled in secondary education 81% (n=125).

#### 4.2 Distribution of nutritional knowledge, attitude, practice and self-efficacy

The nutritional KAP and self-efficacy raw scores were transformed to percentages for nutritional KAP and self-efficacy. The percentage scores for knowledge and attitudes were plotted and showed plotted on histograms. The knowledge and attitudes data showed a normal distribution when a Shapiro Wilk normality test was conducted. Whilst practice and self-efficacy were not normal and showed a positively skewed direction on the left [Figure 4.1].

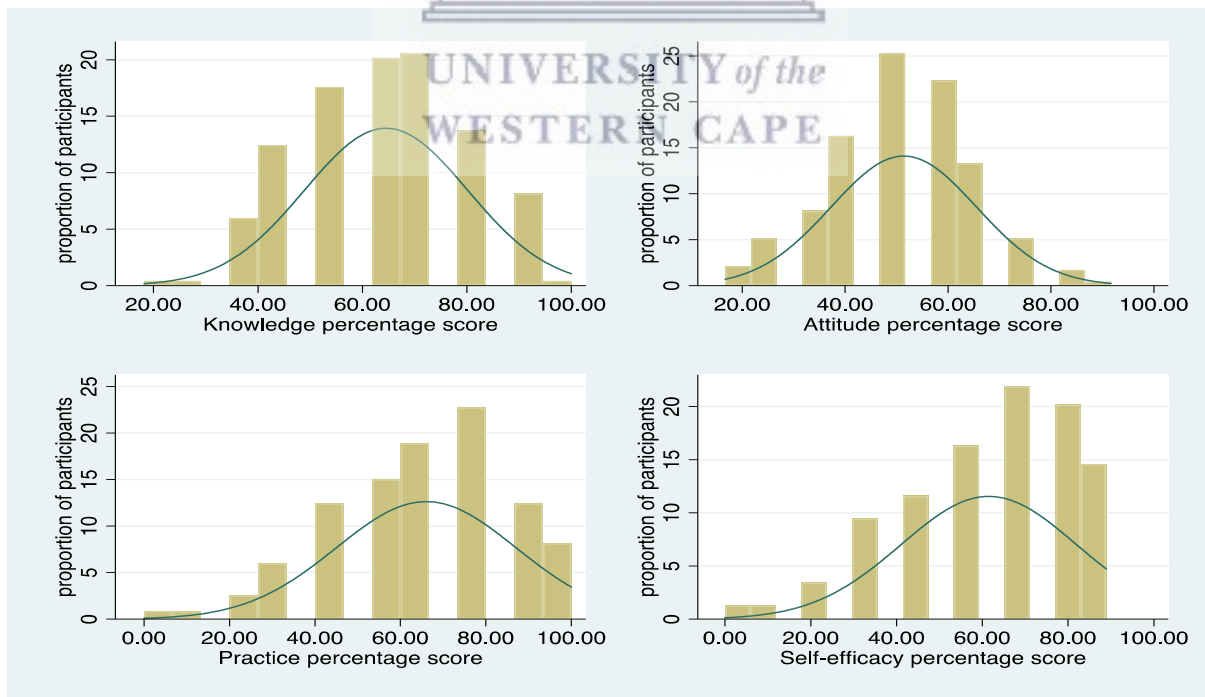


Figure 4.1 Histogram of the distribution of percentage scores for adolescents' nutritional KAP and self - efficacy



Table 4.2 shows the mean score and standard deviation for raw score and percent score, whilst the interquartile range is provided for percentage scores only. The lowest mean score percentage was for attitude (51.4%), just above the break-even mark of 50% [Table 4.2]. Percentage mean scores for knowledge (64.5%), practices (66.0%) and self-efficacy (61.5%) were similar, about 10% higher than that of attitudes. There was no difference in the mean scores by age groups for nutritional attitude, practices, and self-efficacy; p values <0.005. Yet, for nutritional knowledge, a higher proportion of older adolescents obtained correct nutritional knowledge compared to younger adolescents (66.5%, vs 60.6%, p=0.006).

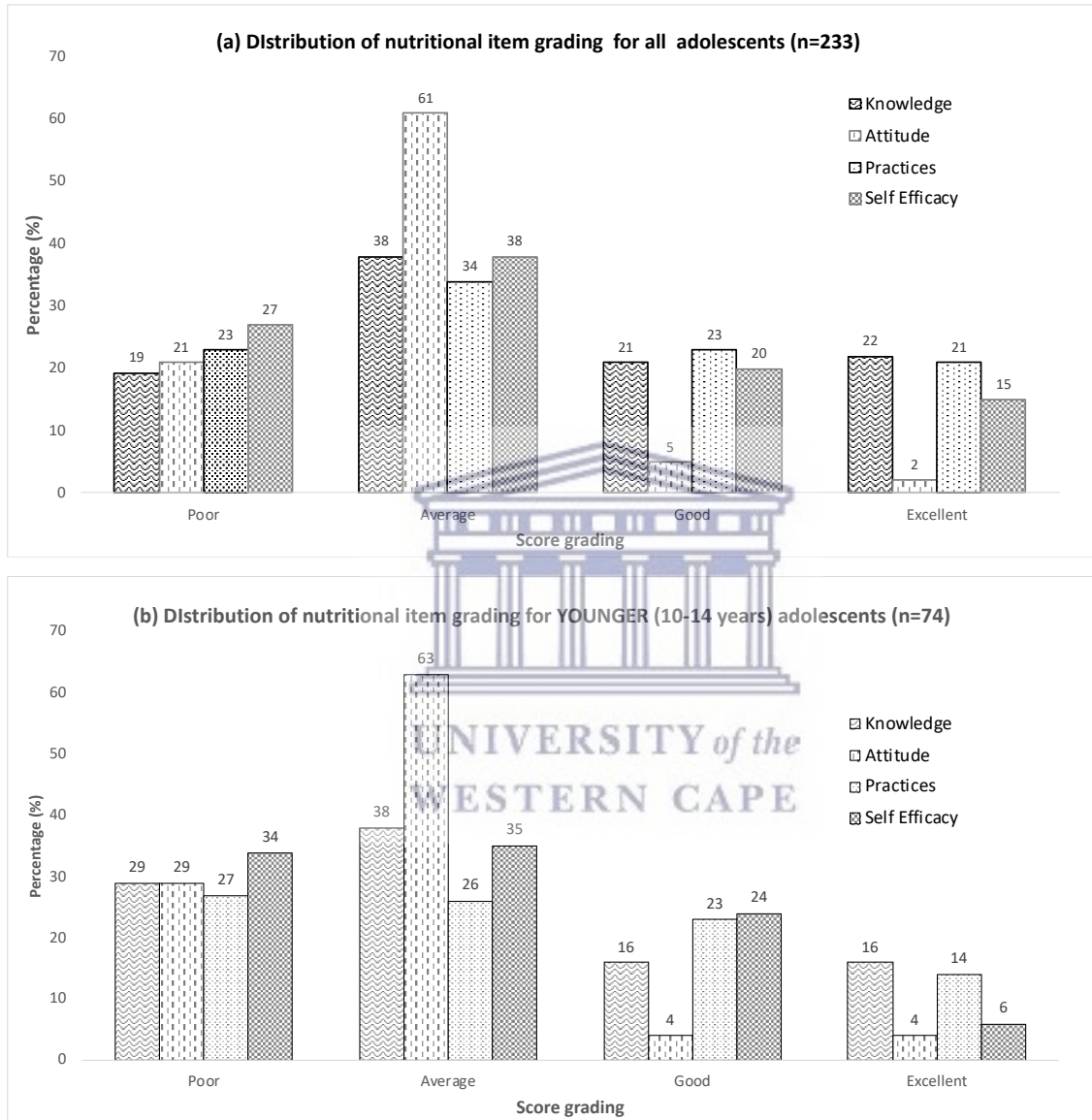
**Table 4.2: Findings of respondents' nutritional KAP and self-efficacy**

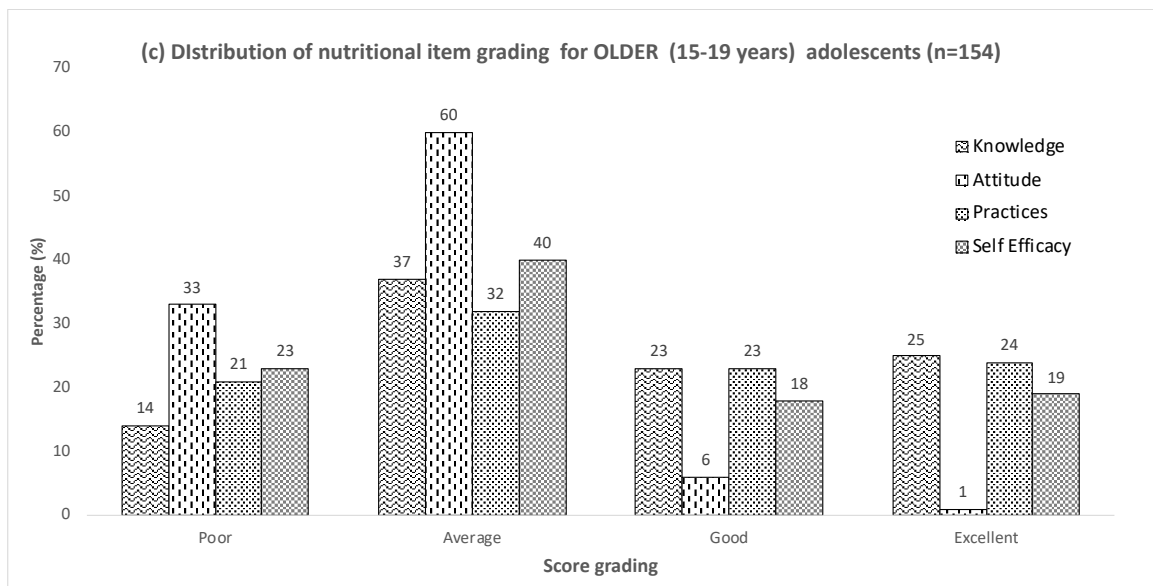
		Everyone	10-14 years (N=79; 34%)	15-19 years (N=154; 66%)	p-value
<b>Knowledge</b> <b>0-11</b>	Median score	6	5	6	0.0062
	μ Score (SD)	7 (1.72)	7 (1.84)	7 (1.62)	
	Median percent	63.6	63.4	63.4	
	μ % (SD)	64.5 (15.6)	60.6 (16.7)	66.5 (14.5)	
	% IQR	54.5-72.7	45.5-72.7	54.5-81.7	
<b>Attitude</b> <b>0-9</b>	Median score	5	5	5	0.9208
	μ Score (SD)	6.12 (1.70)	6.15 (1.8)	6.17 (1.64)	
	Median percent	50.0	50.0	50.0	
	μ % (SD)	51.4 (14.1)	51.3 (15.1)	51.5 (13.7)	
	% IQR	41.2-58.3	41.7-58.3	41.7-58.3	
<b>Practices</b> <b>0-13</b>	Median score	5	4	5	0.133
	μ Score (SD)	6 (1.9)	6 (1.8)	6 (1.9)	
	Median percent	66.7	66.7	66.7	
	μ % (SD)	66.0 (21.1)	63.2 (20.3)	67.5 (21.3)	
	% IQR	55.6-77.8	44.4-77.8	55.6-77.8	
<b>Self-Efficacy</b> <b>0-9</b>	Median score	6	6	6	0.0791
	μ Score (SD)	6 (1.8)	6 (1.8)	6 (1.9)	
	Median percent	66.7	66.7	66.7	
	μ % (SD)	61.5 (20.5)	58.2 (19.7)	63.3 (20.7)	
	% IQR	44.4-77.8	44.4-77.8	55.6-77.8	

μ =mean | IQR =interquartile range

#### 4.4 Four level individual's grading for nutritional knowledge, attitude, practice and self-efficacy

The nutritional scores were further divided into four grading levels: <50% for poor, 50-69% for average, 70-80% for good and >80% for excellent. Figure 4.3 shows the distribution of this four-level grading nutritional KAP and self-efficacy for everyone (a), for younger adolescents (b) and for older adolescents (c).





**Figure 4.3 Distribution of four-level grading system for percentage scores**

#### 4.4.1 Nutrition knowledge

Comparing among the two age groups of 10-14 and 15-19 years, the older adolescents 15-19 years had higher nutritional knowledge scores compared to the 10-14 years group [Figure 4.3 b & c]. Both age groups had an equal percentage of adolescents (38%) who scored average. More adolescents in the 15- 19 years age bracket were classified as either good (23%) or excellent (25%) compared to younger adolescents. For the adolescent ages 10-14 years, 16% were classified as good and 16% were classified with excellent performance. About 14% of adolescents between 15-19 years performed poorly (below 50%) as compared to adolescents between 10 -14years old who had 29% adolescents performing poorly (below 50%).

The individual nutritional knowledge questions were examined in detail per Appendix I. The results show that the adolescents knew basic nutrient requirements including substituting certain food to get the same nutrients. The desirable practices are highlighted in grey. Above 90% of adolescents knew of the importance of washing hands with soap to prevent infectious diseases and the importance of eating a healthy meal every day. Most adolescent girls (90%) showed understanding that maize can be eaten as an energy food and 72.1% of the adolescents understood that rice can be replaced with bread. A majority of the adolescent girls (83%,) understood that vegetables and fruits are a good source of vitamins and minerals.

Poor performance on knowledge of antioxidants was observed since more than 50% of the respondents did not have the correct answer. About 50.2% of the total respondents understood that animal protein can be replaced with plant protein. However, the respondents showed poor

knowledge performance on understanding that they also need food high in fibre since less 64% did not know the correct answer they answered true or selected do not know. Only 60% knew that HIV is not related to HIV infection.

Looking at difference by age group, vegetables and fruits were equally understood as sources of vitamins and minerals since by adolescents 15 – 19 years (58%) and those 10-14 years (10%) adolescents. For questions that required an understanding of nutrient substitution; about 32.6% of 15-19 years old understood that maize can be eaten as an energy food whilst only 17.6% of those 10-14 years knew this. A similar trend was seen for rice substitution, more adolescents of 15-19 years (33%) knew that rice can be replaced with bread as compared to 17.6 % of 10 - 14 years.

#### **4.4.2 Nutrition attitudes**

The nutrition attitudes data was compared among the two age groups of 10-14 and 15-19 years [Figure 4.3 b & c]. There was no difference in the grading of the nutritional attitude percentage score by age groups. Both 10-14 years and 15-19 years had equal proportion of adolescents attaining poor (30%-49%), and average (50-69%). This left a few adolescents who had a grading of good and excellent for both 10-14 years (4%&4% respectively) and 15-19 years (6% &1% respectively).

The individual items for nutrition attitudes are summarized in Appendix J. The desirable practices are highlighted in grey. The majority of the adolescents (78%) had excellent attitudes towards personal hygiene since they believed hygiene is important and 75% understood that cutting and cleaning nails is good behaviour related to food preparation and handling. Also, about 72% of adolescent girls understood that ideal body weight needs to be achieved by the application of a balanced diet every day. A majority had the good attitudes towards acquiring a nutritious meal since they understood that vegetables are important to keep a healthy body and over 70% agreed or strongly agreed. About 60% of the adolescents' scored above average mark for positive attitudes towards a balanced meal.

However, the findings further reveal that adolescents did not have the good attitudes towards the purchase of healthy foods since 34% had a neutral response and almost 28% believed that a balanced meal is expensive. Majority of adolescents had neutral attitude towards animal protein and vegetable protein as most of the girls (40%) had a neutral response and only 25% of the sample understood that animal protein is superior to plant protein.

#### **4.4.3 Nutrition practices**

Older adolescents had higher nutritional practice scores compared to the 10-14 years group [Figure 4.3 b&c]. A key difference in scores was in the proportion of adolescents getting excellent grading. For adolescents in the 15- 19 years age bracket, 24% were classified as excellent compared to 14% for ages of 10 -14 years. Distribution of poor, average and good were comparable. About 27% adolescents between ages of 10 -14 years performed poorly whilst 21% adolescents between ages 15-19 years performed poorly. About 32% of adolescents between 15-19 years scored average as compared to 26% adolescents between 10 -14 years old. Roughly an equal proportion of adolescents ages 10 -14 years (27%) and 15-19 years (21%) performed poorly.

The results on Appendix K shows the distribution of adolescent's practices for the individual items. The desirable practices are highlighted in grey. Majority of adolescents (76%) had correct responses which showed that good practices are possessed by the adolescents. About 78 % of the adolescents also had the correct practice towards hygiene being important as food and nutrition as well as drinking 8 glasses of water per day. Approximately 79 % of adolescents had the correct understanding that ideal body weight can be achieved by the application of a balanced diet every day. More than 70% of the girls understood that a balanced meal needs to be taken before taking their ARVs. The results also show that the adolescents have healthy hygiene practices as their score was above 70% on questions testing their hygiene practices.

The findings also reveal that adolescents have average healthy eating practices as most of them answered between agreeing and strongly agreeing on questions that were testing their health practices and scores were above 50%. At least 50% answered between strongly disagree and disagree with eating junk foods at school also over 60% answered strongly disagree with eating meats that are deep fat fried.

#### **4.4.4 Self-efficacy**

Older adolescents 15-19 years had higher nutritional self -efficacy scores compared to the 10-14 years group [Figure 4.3b&c]. About 37% adolescents in the 15- 19 years age bracket were between good 18% and excellent 19%. Whilst, 24% adolescents between ages 10 -14 years scored good and 6% scored as excellent. Moreover, a total of 23% of adolescents between 15-19 years performed poorly (below 50%) as compared to 34% adolescents between 10 -14 years old performing poorly. A total of 40% adolescents between the ages 15-19 years were classified

with average performance whilst adolescents between ages 10-14 years who performed within average were 35%.

Appendix L shows the results of individual items of the nutrition self-efficacy. The desirable scores are highlighted in grey. The findings show that adolescents scored above 70% on questions that assessed their confidence that they can exercise and monitor their weight. Adolescents further scored more than 70% on self-efficacy for personal hygiene. Adolescents also scored average performance of 60% and were between strongly agree and agree on questions that assessed their perception on their ability to prepare a balanced meal and to make sure that the food has a variety of food products. At least 50% of the adolescents indicated that they believe they are well able to shop for affordable healthy food and drink at least 2L of water per day.

#### **4.5 Nutrition knowledge gaps of adolescent girls living with HIV**

Appendix O shows the nutrition gaps of adolescent girls living with HIV for both ages 10-14 and 15-19 years old. The nutrition knowledge gaps of adolescent girls living with HIV was established by examining at the knowledge questions that received low scores, the adolescents who showed a wrong response or did not know were marked with a 0 and right answer marked 1. The findings show that the adolescents' knowledge gaps existed in understanding animal and plant nutrient replacements, antioxidants intake and the relationship between nutrition and HIV. In this study the findings show that adolescents of ages 15-19 years old 75% did not understand that eating cheap fruits and vegetables still provides the same amount of vitamins and minerals and a total of 69% adolescents of ages 10-14 years had this information.

Atleast, 46% of adolescents between 10-14 years and 50% adolescents between ages 15-19 years old did not understand nutrient replacement for animal and plant proteins. A total of 51% adolescents ages of 10-14 years old and 35% did not know that HIV is not caused by poor nutrition. Moreover, a total of 51% of adolescents between ages of 10-14 years and 48% of adolescents between ages of 15-19 years old did not know that antioxidants are not poisonous for People living with HIV. A total of 66% of adolescents between ages of 10-14 years and 63% of adolescents between ages of 15-19 years old did not know that high-fiber food is not dangerous for people living with HIV.

#### 4.5 Association between sociodemographic, nutritional KAP and Self-efficacy

The Pearson correlation coefficient was used as a measure of the strength and direction of association that exists all nutritional KAP and self-efficacy percent scores. Table 4.3 shows the output, with a co-efficient of 0.1-0.3 as a small correlation, 0.3-0.5 as a medium correlation and >0.5 as a strong correlation.

The results reveal that, there is a positive association between all four nutritional measures: knowledge, attitude, practice, and self-efficacy, the correlation ranges between small to medium. No associations between the variables can be stated as strong. For knowledge, it is equally moderately correlated with attitude and practice, with the association between knowledge and practice being statistically significant. The association between knowledge and with nutritional self-efficacy was very weak with a co-efficient of 0.0976. The correlation between attitude and practice, were also weak, with co-efficient of 0.1408 and 0.1544 respectively. However, the association between practice and self-efficacy was medium and statistically significant. That is to say, those who had good nutritional practices were also more likely to perceive themselves as confident with relation to nutrition control and hygiene.

**Table 4.3: Pearson’s correlation between nutritional KAP and self -efficacy percent scores**

Variable	Statistical test	Knowledge [1]	Attitude [2]	Practice [3]	Self-efficacy [4]
Knowledge [1]	p r	1.000			
Attitude [2]	p r	0.2145 0.0010	1.000		
Practice [3]	p c	0.2266 0.0005	0.1408 0.0316	1.000	
Self-efficacy [4]	p r	0.0976 0.1376	0.1544 0.0183	0.4008 0.0000	1.000

p= p value, r= correlation coefficient

#### **4.6 Conclusion**

This chapter provided the results for this study indicating that overall knowledge was higher for older adolescents, whilst younger adolescents had lower knowledge. The evidence presented above shows descriptive and inferential analysis of the data presented using tables frequencies and correlation.





## CHAPTER 5: DISCUSSION OF MAIN FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Introduction

The previous chapter presented findings from questionnaire responses from conveniently sampled adolescent girls. This chapter discusses the main findings in relation to the objective of the study, critical questions, supporting theory and reviewed literature. On the basis of this discussion, conclusions are drawn, and recommendations are made. The four main objectives of the study were to:

- i) To describe the socio-demographic characteristics of adolescent girls living with HIV
- ii) To assess the nutritional knowledge, attitudes, practices, and self-efficacy of adolescent girls living with HIV
- iii) To identify knowledge gaps that influence nutrition practices of adolescent girls
- iv) To examine the relationship on nutrition knowledge, attitudes, practices, and self-efficacy of adolescent girls living with HIV.

### 5.2 Discussion of main findings

A total of 233 adolescent girls living with HIV between the ages of 10 – 14 years and 15-19 years old were interviewed in the study. A majority 66% (n= 154) of adolescent girls in this survey were between the ages of 15-19 years. More than half 63% (n=147) of the adolescent girls were at secondary/high school level. Considering these age groups, it is no surprise that most of the adolescent girls receive household food provision at the family level from their parents 77.7% (n= 179). Interestingly, this is an indication that most of these adolescents are still dependents relying solely on their parents' support. Most households' (54.9%, n= 127) source of income in this study is a salary whilst a small percentage (6%, n= 127) relies on social grants.

According to FAO (2014) nutrition knowledge is the individuals' understanding of nutrition, including the intellectual ability to remember and recall food and nutrition-related terminology, specific pieces of information, and fact. When comparing the data amongst the two age groups (10-14 and 15-19), 15–19-year-olds obtained higher knowledge scores. This can be attributed to them being in higher grades and having had an opportunity to acquire some of the knowledge in class and the adherence club curriculum also has provision of information sessions on nutrition knowledge. Literature by Koch, Hoffmann and Claupein, (2021, p.5) revealed that

nutrition knowledge differed significantly between socio-demographic groups and that nutrition knowledge was higher in younger age groups in a study that was conducted in a German general population on nutrition knowledge. This study also revealed that as adolescent girls grow, they are given more lessons on food handling, preparation and hygiene. Therefore, it can be argued that the high knowledge scores are also due to their practical lived experiences with food preparation, handling and hygiene taught in the household.

The study revealed that adolescent attitudes ranged from mostly poor to average when scored using the score classification. In this study, most adolescent girls (64.4%) knew that preparing a balanced meal is not time-consuming and 71% identified that one needs to eat a variety of foods in order to get all nutrients. However, 21% of adolescents did not know that it is important to eat a balanced meal when on ART. Therefore, it is important to explore why adolescents lacked knowledge in this area and therefore, tailor make educational sessions that aim towards shifting the adolescent's attitude scores from poor to excellent. These methods could include conducting education sessions, providing practical food preparation and handling sessions with adolescents as well as capacitating parents and care givers to transfer these skills to the adolescents.

Further, there was a weak association between knowledge and practice. This is in contrast to evidence that often-good attitudes lead to the application of good practices among adolescents (Nabeel and Rachel, 2017, p.551). This association could have been attributed by the fact that young people do not have power in food practice because they might not be the one preparing the meals, they do not have power for purchasing food at the household level. There was also a strong correlation between nutritional practices and self-efficacy. About 75% adolescent girls understood that it is a good practice to eat vegetables in every meal and 86% of adolescent girls had a high self-efficacy on hygiene. This evidence is in line with research findings that have shown that there is a correlation between nutritional knowledge of adolescents and the eating habits (Nabeel and Rachel, 2017, p.551). The Theory of Planned Behaviour and Theory of Reasoned Behaviour suggests that behaviour is not only determined by intentions and attitudes, but it is also determined by subjective norms. Therefore, a behavioural intention represents an individual's commitment to act and is itself the outcome of a combination of several variables (Kagee and Freeman, 2017).

The study has several limitations worth noting. Adolescents with older ages were found to be more informed than those with lower ages as they obtained higher scores, which could be an

indication of exposure as well as being better informed. This could be delved in deeper to better clarify such disparities, however this was not done in this study due to low sample size. Therefore, a more representative sample size from the four regions could improve the generalizability of the results. Moreover, the adolescents living with HIV self-efficacy tool is a newly designed tool therefore, caution needs to be taken care of when using it. However, there are benefits to the study. The findings of this study provide theoretical and practical contributions to the body of knowledge in understanding factors such as nutritional knowledge, attitudes, practices, and self-efficacy of adolescents living with HIV. Additionally, it provides an opportunity to make recommendation as highlighted below.

### **5.3 Recommendations**

- It is advised that nutrition and HIV/AIDS programmers design and implement interventions that will seek to address attitudes and practices of adolescent girls living with HIV ages 10 -14 years. This can be done through applying holistic behaviour change strategies including supporting the adolescent through menu planning and cooking to encourage healthy eating habits among the adolescent girls living with HIV. Moreover, the involvement of parents to support their children to comply with nutritional diet and good habits can yield great results.
- In support of adolescent girls living with HIV nutrition needs, nutrition and HIV/AIDS programmers and government stakeholders need to work on resource mobilization and provision of support of basic food for healthy and balanced meals of adolescents living with HIV.
- The study applied descriptive methods of analysing nutrition gaps therefore, it is recommended to conduct further study that will investigate the nutritional gaps through use of relevant inferential statistical methods. These findings can provide a measurable situation analysis and shape the design of nutrition education interventions targeting adolescents living with HIV.

### **5.4 Conclusion**

This study employed the Theory of Planned Behaviour, which proved to be helpful when addressing the study's objectives. The study sought to explore the nutritional knowledge, attitudes, practices and self-efficacy for adolescents living with HIV and the relationship between the identified factors with the socio-demographic characters of adolescent girls living with HIV in the Kingdom of Eswatini, Manzini region. The evidence suggests that adolescents

have varying nutritional knowledge, attitudes, practices, and self-efficacy. Despite these variations, adolescent girls living with HIV are adequately informed about nutritional knowledge, hence a good percentage displayed good self-efficacy and practice what they know with regards to good nutritional practices. There is room for enhancing these factors especially for adolescents in higher ages since they have the capacity and privilege to plan and prepare meals at household level.



## REFERENCES

AIDS Free, 2017. Strengthening High-Impact Interventions for an AIDS-free Generation-Swaziland Integrated Teen Club Curriculum: Teen Club Instructional Material for Adolescents—Sexual and Reproductive Health and HIV Care. Arlington, VA: AIDSFree Project. Available: [https://pdf.usaid.gov/pdf\\_docs/PA00N5JV.pdf](https://pdf.usaid.gov/pdf_docs/PA00N5JV.pdf). [Accessed 12 September 2022]

Alkerwi, A., Vernier, C., Sauvageot, N., Crichton, G. & Elias M. (2015). ‘Demographic and socioeconomic disparity in nutrition: application of a novel Correlated Component Regression approach’, *BMJ Open* [ejournal], 5(5), pp.1. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4431064/>. [Accessed 13 September 2021]

Al-Yateem N & Rossiter R, (2017). Nutritional knowledge and habits of adolescents aged 9 to 13 years in Sharjah, United Arab Emirates: a cross-sectional study. *Eastern Mediterranean Health Journal*, 23(8) <http://www.emro.who.int/emhj-volume-23-2017/volume-23-issue-8/nutritional-knowledge-and-habits-of-adolescents-aged-9-to-13-years-in-> [Accessed: 30 July 2022].

Ara, A.B, Ledezm, Z., Massar, K. & Kok, G. (2020). ‘Behavioural and environmental influences on adolescent decision making in personal relationships: a qualitative multi-stakeholder exploration in Panama’, *Health Education Research* [ejournal], 35(1), pp.1-14. Available: DOI: 10.1093/her/cyz033.

Babbie, E. & Mouton, J. (2014). *The practice of social research*. Cape Town: Oxford University Press Southern Africa.

Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: W H Freeman and Company.

Becher, S. (2009). ‘Adolescents’ Self-Efficacy toward Healthy Lifestyle Behaviours after Attending a School-Based Intervention Course Focused on Physical Activity and Healthy Eating’, *Electronic Thesis or Dissertation*. Available at: <https://etd.ohiolink.edu/>

Belle, J. A. & Gamedze, N. N., (2019). ‘Behavioural factors contributing to the transmission of HIV and AIDS amongst young women of Mbabane in Swaziland’, *African Health Sciences* [ejournal], 19(3), pp.2302-2311. Available: DOI: 10.4314/ahs.v19i3.2.

Bello, T. K., Gericke, G.J., MacIntyre, U.E. & Becker, P. (2019). 'A nutrition education programme improves quality of life but not anthropometric status of adults living with HIV in Abeokuta, Nigeria', *Public Health Nutrition* [ejournal], 22(12), pp.2290-2302. Available: DOI:10.1017/S1368980019000636

Bist, R. B., (2014). 'Research procedure: An introduction', *Journal of NELTA Surkhet* [ejournal], 4, pp.34-40. Available: DOI: <https://doi.org/10.3126/jns.v4i0.12858>.

Bjertrup P.J., Mmemba N., Dlamini V., Cigleniki I., Mpala Q., Matse S., Kerschberger B & Winge A. (2021). PrEP reminds me that I am the one to take responsibility of my life: a qualitative study exploring experiences of and attitudes towards pre-exposure prophylaxis use by women in Eswatini. *BC Public Health* 21, 727 (2021). Available: <https://doi.org/10.1186/s12889-021-10766-0>. [Accessed 12 September 2022]

Bukusuba J., Kikafunda J.K., & Whitehead, R.G. (2010). 'Nutritional knowledge, attitudes, and practices of women living with HIV in Eastern Uganda' *Journal of Health, Population and Nutrition* [ejournal], 28(2), pp.182 Available from: DOI: 10.3329/jhpn. v28i2.4890

Brown R, Seabrook JA, Stranges S, Clark AF, Haines J, O'Connor C, Doherty S & Gilliland J. A. (2021). Examining the Correlates of Adolescent Food and Nutrition Knowledge. *Nutrients*. 15;13(6):2044. <https://www.mdpi.com/2072-6643/13/6/2044>. [Accessed 21 May 2020]

Chen, F. P. (2008). 'HIV/AIDS prevent among young people in East and South-East Asia in the context of reproductive and sexual health', *Asia Pacific Population* [ejournal], 23, pp.7–28. Available: DOI: <https://doi.org/10.18356/2f9cf12d-en>. [Accessed 21 May 2021]

Chen, Y., Michalak, M & Agellon,. L. 2018. Importance of Nutrients and Nutrient Metabolism on Human Health. *PubMed*: 91(2) 95-103 Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6020734/>. [Accessed 21 May 2021]

Christiane, N.A., Roger, Z.M., Masika, J. & Zhang, Y. (2014). 'HIV/AIDS prevalence, knowledge, attitudes and related behaviours among young people in Libreville, Gabon', *IOSR Journal of Humanities and Social Science* [ejournal]. 19(1), pp.59-65. Available: [https://www.fastrackcities.org/sites/default/files/HIV\\_AIDS%20Libreville,%20IOSR.pdf](https://www.fastrackcities.org/sites/default/files/HIV_AIDS%20Libreville,%20IOSR.pdf). [Accessed 15 June 2020]

Christian, P., & Smith, E.R. (2018). 'Adolescent Undernutrition: Global Burden, Physiology, and Nutritional Risks', *Ann Nutr Metab* [ejournal], 72(4), pp.316-328. Available: DOI: 10.1159/000488865.

Conner, M. (2001). 'Health behaviours', *International Encyclopaedia of the Social and Behavioural Sciences*, Pergamon, pp. 6506-6512. Available: <https://doi.org/10.1016/B0-08-043076-7/03871-7>. [Accessed 15 June 2022]

Creswell, J. (2014). *Research design: Qualitative, Quantitative, and Mixed methods approaches*. 4th edition. Thousand Oaks, California: Sage.

Creswell, J. W. & Plano Clark, V.L. (2018). *Designing and conducting mixed methods research*. 3rd ed. Thousand Oaks, California: Sage.

Cunha, D. B., Sichieri R., de Almeida, R.M. & Pereira, RA. (2011). 'Factors associated with dietary patterns among low-income adults', *Public Health Nutr* [ejournal], 14(9), pp.1579–1585. Available: DOI: 10.1017/S136898001000354X [Accessed 12 June 2020]

Dermatol, J. 2016. Methodology Series Module: Cross-sectional Studies. *Indian Dermatology* 61(3):261-264. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4885177/> [Accessed 15 March 2022]

Das, S.K., Roberts, S.B., Bhapkar, M.V., Villareal, D.T., Fontana, L. & Martin, C.K. (2017). 'Calerie-2 study group body-composition changes in the comprehensive assessment of long-term effects of reducing intake of energy (CALERIE)-2 study: a 2-y randomized controlled trial of calorie restriction in non-obese humans', *Am J Clin Nutr* [ejournal]. 105(4), pp. 913-927. Available: <https://pubmed.ncbi.nlm.nih.gov/28228420/> [Accessed 12 June 2020].

Duggal, S., Chugh, T.D. & Duggal, A.K. (2012). 'HIV and malnutrition: effects on the immune system', *Clinical and Developmental Immunology* [ejournal], pp.1-8. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3254022/>. [Accessed 15 July 2020]

Elfil, M & Negida A. (2017). Sampling methods in Clinical Research; an Educational Review. *Emerg (Tehran)*;5(1): PMID: 28286859; PMCID: PMC5325924. [Accessed 01 August 2021]

Efthymiou, V., Charmandari, E., Vlachakis, D., Tsitsika, A., Pałasz, A., Chrousos, G. & Bacopoulou, F. (2021). 'Adolescent Self-Efficacy for Diet and Exercise Following a School-

Based Multicomponent Lifestyle Intervention’, *Nutrients* [ejournal], 14(1), pp.97. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8746524/>. [Accessed 01 August 2022]

FAO. (2014). KAP Manual: Guidelines for Assessing Nutrition related Knowledge, Attitudes and Practices. Food and Agriculture Organization. Available: [http:// https://pnin-niger.org/pnin-doc/web/uploads/documents/199/Doc-20191104-110146.pdf](http://https://pnin-niger.org/pnin-doc/web/uploads/documents/199/Doc-20191104-110146.pdf) [Accessed 23 September 2020].

Ganga, E. & Maphalala, M.C (2014). ‘Developmental experiences of OVC in child-headed households and the impact on cognition and learning’, *Mediterranean Journal of Social Sciences* [ejournal], 5(3), pp.312-320. Available: DOI: 10.5901/mjss. 2014.v5n3p312.

George Town University (GU). (2020). Adolescent Teen clubs in Eswatini. Mbabane. Eswatini

Global Fund. 2019. The Global Fund to fight AIDS, Tuberculosis and Malaria. Geneva. Switzerland. Available: [https://www.theglobalfund.org/media/1296/publication\\_womengirls\\_focuson\\_en.pdf](https://www.theglobalfund.org/media/1296/publication_womengirls_focuson_en.pdf) [Accessed 07 June 2020]

Hendrie, G., Coveney, J. D. & Cox, D. (2008). ‘Exploring nutrition knowledge and the demographic variation in knowledge levels in an Australian community sample’, *Public Health Nutrition* [ejournal]. 11(12), pp.1365-1371. Available: <https://doi.org/10.1017/S1368980008003042>.

Heron, S. E. & Elahi, S. (2017). HIV infection and compromised mucosal immunity: oral manifestations and systematic inflammation’, *Frontiers in Immunology* [ejournal]. 8(241). Available: <https://www.frontiersin.org/articles/10.3389/fimmu.2017.00241/full> [Accessed 06 September 2020]

Ihudiebube-Splendor, C.N. & Chikeme, P.C. (2020). *A Descriptive Cross-Sectional Study: Practical and Feasible Design in Investigating Health Care-Seeking Behaviours of Undergraduates*. [ebook] New York: Sage Publications. Available at: DOI:10.4135/9781529742862.

Irala-Estevez, D., Groth, M., Johansson, L., Oltersdorf, U., Prättälä, R. & Martínez-González, M.A. (2000). ‘A systematic review of socio-economic differences in food habits in Europe: consumption of fruit and vegetables’, *European Journal of Clinical Nutrition* [ejournal], 54(9), pp.706-714. Available at: DOI: 10.1038/sj.ejcn.1601080.



Jain R, Anand P, Dhyani A, & Bansal D. (2017). Knowledge and awareness regarding menstruation and HIV/AIDS among school-going adolescent girls. *J Family Med Prim Care* (1):47-51. Available: <https://pubmed.ncbi.nlm.nih.gov/29026748/>. [Accessed 1 July 2022]

Kagee, A. & Freeman, M. (2017). *Mental health and physical health including HIV/AIDS*. 2<sup>nd</sup> ed. in *International Encyclopaedia of Public Health* [ebook]. Available: <https://doi.org/10.1016/B978-0-12-803678-5.00282-4>.

Koch, F., Hoffmann, I. & Claupein, E. (2021). ‘Types of nutrition knowledge, their socio-demographic determinants and their association with food Consumption: results of the NEMONIT Study’, *Front Nutr* [ejournal]. Available: <https://www.frontiersin.org/articles/10.3389/fnut.2021.630014/full>. [Accessed 20 August 2022]

Leedy, P.D. & Ormrod, J.E. 2015. *Practical research planning and design*. 11<sup>th</sup> Ed. London: Pearson. Available: [https://pcefet.com/common/library/books/51/2590%5BPaul D. Leedy, Jeanne Ellis Ormrod%5D Practical Res\(b-ok.org\).pdf](https://pcefet.com/common/library/books/51/2590%5BPaul%20D.%20Leedy,%20Jeanne%20Ellis%20Ormrod%5D%20Practical%20Res(b-ok.org).pdf). [Accessed 17 September 2021]

Maris, P. (2001). ‘A brief questionnaire for measuring self-efficacy in youths,’ *Journal of Psychopathology and Behavioral Assessment* [journal], 23, pp.145–149. Available at: <https://link.springer.com/article/10.1023/A:1010961119608>. [Accessed 19 September 2019]

Masuku, K.S.K & Lan, S.J. 2014. ‘Nutritional knowledge, attitude, and practices among pregnant and lactating women living with HIV in the Manzini region’, *International Center for Diarrheal* [journal]. 32(2), pp.261-269. Available: DOI: 10.4236/ojss.2012.23032.

Mathers, N., Fox, N. & Hun, A. 2007. *Surveys and Questionnaires*. [Ebook] Trent: Their RDS for the East Midlands/Yorkshire and the Humber. Available at: DOI: 10.4236/ojss.2012.23032.

Mcbride K., Parent J., Chivwala M., Nyirenda M., Schooley A., Mwambene J.B., Dovel K., Lungu E., Balkasi k., Hoffman., Moucheraud C., 2019. ART Adherence Among Malawian Youth Enrolled in Teen Clubs: A Retrospective Chart Review. Available: <https://pubmed.ncbi.nlm.nih.gov/31292826/>. [Accessed 8 October 2022]

Miming, M.J. & Safren, S.A. 2009. ‘Childhood sexual abuse in highly associated with HIV risk-taking behaviour and infection among MSM in the EXPLORE study’, *JAIDS Journal of Acquired Immune Deficiency Syndromes* [ejournal], 51(3), pp.340–348. Available at: <https://doi.org/10.1097/QAI.0b013e3181a24b38>.

Ministry of Health (MOH), 2017. Swaziland HIV incidence measurement survey 2: a population - based HIV impact assessment SHIMS 2 2016-2017. [EBook] Mbabane:

Ministry of Health & Baylor College of Medicine (2018). Impact Evaluation of the Teen Club Programme for Adolescents Living with HIV in Eswatini. Available: <https://www.unicef.org/eswatini/media/1156/file/Final%20teen%20club%20evaluation%20report-2018.pdf.pdf>. [Accessed 05 October 2022]

Ministry of Health (MOH), 2018. Swaziland Annual Report, Mbabane: UNICEF

Munyayi FK & Van Wyk B, 2020. The effects of Teen Clubs on retention in HIV care among adolescents in Windhoek, Namibia. *South Afr J HIV* 3:21(1):1031. Available: <https://sajhivmed.org.za/index.php/hivmed/article/view/1031/1766>. [Accessed: 30 July 2022]

Nana, A., & Zama, T. (2018). Dietary practices and associated factors during pregnancy In Northwestern Ethiopia. *BMC Pregnancy Childbirth* 18, <https://doi.org/10.1186/s12884-018-1822-1>. [Accessed 30 May 2021]

National Food and Nutrition Commission. (2017). *Nutrition guidelines for care and support of people with HIV*. [eBook] Lusaka: National Food and Nutrition Commission. Available at: <https://www.fantaproject.org/sites/default/files/resources/Zambia-National-Nutrition-HIV-Guidelines-2017.pdf>. [Accessed 30 May 2021]

Nassim G, Redmond M. L., Ofei-Dodoo S, Benton M, & Lu K. (2020). Nutrition Self-Efficacy and Dietary Patterns among Older African American Women in Kansas. *Kans J Med.*13:209-213.

Neighbors, C., Foster, D.W. & Fossos, N. (2013). 'Peer influences on addiction', *Principles of Addiction*, pp. 323-331. Available: <https://doi.org/10.1016/B978-0-12-398336-7.00033-4> Accessed 8 August 2020]

Nothwehr, F. (2008). 'Self-efficacy and its association with use of diet-related behavioral strategies and reported dietary intake', *Health Education and Behavior* [journal], 35(5), pp.698-706. Available at: <https://journals.sagepub.com/doi/10.1177/1090198106296771>. [Accessed 20 April 2020]

NERCHA, (2019). The National Multi- Sectorial HIV/AIDS Strategic Framework NSF 2018-2023, Mbabane: National Emergency Research HIV/AIDS Council.

[https://hivpreventioncoalition.unaids.org/wp-content/uploads/2019/06/Eswatini\\_NSF-2018-2023-final.pdf](https://hivpreventioncoalition.unaids.org/wp-content/uploads/2019/06/Eswatini_NSF-2018-2023-final.pdf). [Accessed 8 August 2020]

Onyango, A.W. (2003). 'Dietary diversity, child nutrition and health in contemporary African communities', *Comparative biochemistry and physiology part A: Molecular and Integrative Physiology* [ejournal], 136(1), pp.61-69. Available at: DOI:10.1016/S1095-6433(03)00071-0.

Park, Y., Konge, L., & Artino, A.R. (2020). 'The positivism paradigm of research', *Academic Medicine: journal of the Association of American Medical Colleges* [journal], 95(5), pp.690-694. Available: <https://pubmed.ncbi.nlm.nih.gov/31789841/>. [Accessed 14 September 2021]

Price, R.B., Kuckertz, J. M., Siegle, G.J., Ladouceur, C.D., Silk, J.S. & Ryan, N.D. (2015). 'Empirical recommendations for improving the stability of the dot-probe task in clinical research', *Psychological Assessment* [journal], 27, pp.365–376. Available: <https://pubmed.ncbi.nlm.nih.gov/25419646/>. [Accessed 17 August 2021]

Raiten. D.J., Mulligam. K., Papathakis, P. & Wanke.C. (2011). 'Nutritional Care of HIV Infected Adolescents and Adults including Pregnant and Lactating Women: what do we know? What can we do? And where to go from here?', *The American Journal of Clinical Nutrition* [journal].94(6),pp.1667s-1676s. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3226019/>. [Accessed 27 April 2021]

Republic of Kenya Ministry of Health. (2006). Kenyan National Guidelines on Nutrition and HIV/AIDS. Government of Kenya, Republic of Kenya, Nairobi

Rimer, B. & Glanz, K. (2005). *Theory at a Glance: A Guide for Health Promotion Practice*. 2<sup>nd</sup> ed. Bethesda, MD: National Institutes of Health, National Cancer Institute.

Ryan, S. & Carr, A. (2010). *Applying the biopsychosocial model to the management of rheumatic disease. Rheumatology*. Available: <https://doi.org/10.1016/B978-0-443-06934-5.00005-X>. [Accessed:20 April 2020]

Saeidlou S. N., Babaei F, & Ayremlou P. (2016). Nutritional Knowledge, Attitude and Practice of North West Households in Iran: Is Knowledge likely to Become Practice? *Maedica (Bucur)*11(4):286-295. Available: <https://pubmed.ncbi.nlm.nih.gov/28828044/>. [Accessed 30 July 2022].

Semba, R. D. & Tang A.M. (1999). Micronutrients and the pathogenesis of human

immunodeficiency virus infection. *British Journal of Nutrition*, 81(3), 181–9. Available: <https://pubmed.ncbi.nlm.nih.gov/10434844/>. [Accessed 20 April 2022]

Nutrition Care of adolescents living with HIV. (no date). Session 12: Nutrition

Care of adolescents living with HIV [PowerPoint slides]. Available: <https://www.fantaproject.org> [Accessed: 30 July 2022].

Shapu, R., Ismail, S., Ahmad, N., Ying, L.P. & Abubakar Njodi, I., (2020). ‘Knowledge, attitude, attitude, and practice of adolescent girls towards reducing malnutrition in Maiduguri metropolitan council, Borno State, Nigeria: cross-sectional study’, *Nutrients* [journal], 12(6), pp.1681. Available: <https://doi.org/10.3390/nu12061681>. [Accessed 30 July 2021].

Sharma S, Akhtar F, Singh RK, Mehra S. 2019. Relationships between nutrition-related knowledge, attitude, and self-efficacy among adolescents: A community-based survey. *J Family Med Prim Care* 8(6). Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6618213/> [Accessed 25 April 2022].

Shamsalinia, A., Ghadimi, R., Chafjiri, R.T. Nourinejad F. Pourhabib A & Ghaffari F. (2019). Nutrition self-efficacy assessment: designing and psychometric evaluation in a community-dwelling elderly population. *J Health Popul Nutr* 38, 38. Available: <https://doi.org/10.1186/s41043-019-0203-3>. [Accessed: 25 April 2022].

Shiferaw H, & Gebremedhin S. (2020). Undernutrition Among HIV-Positive Adolescents on Antiretroviral Therapy in Southern Ethiopia. *Adolescent Health M* 19; 11:101-111. Available: <https://pubmed.ncbi.nlm.nih.gov/32903856/>. [Accessed 19 January 2021]

SHIMS2, (2017). Swaziland HIV Incidence Measurement Survey 2: A Population

based HIV Impact Assesment SHIMS 2 2016-2017, Mbabane: Ministry of Health and University of Columbia. Available: [http://phia.icap.columbia.edu/wp-content/uploads/2017/11/Swaziland\\_new.v8.pdf](http://phia.icap.columbia.edu/wp-content/uploads/2017/11/Swaziland_new.v8.pdf). [Accessed 8 August 2020]

Sireesha, Ranjani, N. & Bindu, V. (2017). ‘Teenage Girls Knowledge, Attitude and Practices on Nutrition’, *International Journal of Home Economics*, 3(2), pp.491- 493. Available at: <https://www.homesciencejournal.com/archives/2017/vol3issue2/PartH/3-2-76-385.pdf>. [Accessed 20 April 2022]

Tavakol, M. & Dennick, R. (2011). 'Making sense of Cronbach's alpha', *International Journal of Medical Education* [journal], 2, pp.53-55. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4205511/>. [Accessed 17 November 2021]

UNAIDS (2016). HIV Prevention among Adolescents and Young Women: Priority HIV Prevention among adolescent and Young Women fast track and engaging men and boys, Mbabane: UNAIDS.

UNAIDS. (2018a). *UNAIDS DATA*. Mbabane: UNAIDS. Available at: [https://www.unaids.org/sites/default/files/media\\_asset/unaid-data-2018\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/unaid-data-2018_en.pdf). [Accessed 12 September 20].

UNAIDS. (2018b). Women and Girls and HIV. Geneva: UNAIDS. Available at: [https://www.unaids.org/sites/default/files/media\\_asset/women\\_girls\\_hiv\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/women_girls_hiv_en.pdf). [Accessed 17 October 2020].

UNICEF. (2016). *All in to End the Adolescents AIDS Epidemic*. Pirozzi: UNICEF.

Available: [https://www.unaids.org/sites/default/files/media\\_asset/ALLIN2016ProgresReport\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/ALLIN2016ProgresReport_en.pdf). [Accessed 31 July 2022]

UNICEF (2020). *Adolescents HIV Prevention*, Geneva: UNAIDS. Available: <https://data.org/topic/hic/aids/adolescents-youngpeople/>. [Accessed 12 July 2020]

Variyam, J. N., Blaylock, J., Lin, B.-H., Ralston, K., & Smallwood, D. (1999). Mother's Nutrition Knowledge and Children's Dietary Intakes. *American Journal of Agricultural Economics*, 81(2), 373–384. <https://doi.org/10.2307/1244588>

Whaling, M.A., Luginaah I., Reid, G., Hekmat, S., Thind, A., Mwanga, J. & Chagalucha, J. (2012). 'Perceptions about probiotic yogurt for health and nutrition in the context of HIV/AIDS in Mwanza, Tanzania', *J Health Popul Nutr* [journal], 30, pp.31-40. Available: [https://www.researchgate.net/publication/224822829\\_Perceptions\\_about\\_Probiotic\\_Yogurt\\_f\\_or\\_Health\\_and\\_Nutrition\\_in\\_the\\_Context\\_of\\_HIVAIDS\\_in\\_Mwanza\\_Tanzania](https://www.researchgate.net/publication/224822829_Perceptions_about_Probiotic_Yogurt_f_or_Health_and_Nutrition_in_the_Context_of_HIVAIDS_in_Mwanza_Tanzania). [Accessed 20 April 2021]

WHO. (2014). *Health for the World Adolescents: A Second chance in the second decade*. Mbabane: World Health Organization Eswatini. Available: <http://apps.who.int/adolescent/second-decade/>. Accessed [23 September 2020]

Willing, A, Wright, L. & Galvin, T.A. (2018). 'Practice paper of the Academy of Nutrition and Dietetics: Nutrition intervention and human immunodeficiency virus infection', *Journal of the Academy of Nutrition and Dietetics* [journal], 118(3), pp.486-498. Available at: <https://doi.org/10.1016/j.jand.2017.12.007>

Wilkinson A.L., Huey S.L., & Mehta S. (2018) Antioxidants and HIV/AIDS: Zinc, Selenium, and Vitamins C and E. In: Mehta S, Finkelstein JL, editors. Nutrition and HIV: Epidemiological Evidence to Public Health. New York (NY: CRC Chapter 5. Available: <https://www.ncbi.nlm.nih.gov/books/NBK572228/> doi:10.1201/9781351058193-5. [Accessed 30 July 2022].

Wilson, J. (2010). *Essentials of Business Research: A Guide to Doing Your Research Project*. New York: SAGE Publication

Zheng J, Zhu T, Yang G, Zhao L, Li F, Park YM, Tabung FK, Steck SE, Li X, & Wang H. (2006). The Isocaloric Substitution of Plant-Based and Animal-Based Protein in Relation to Aging-Related Health Outcomes: A Systematic Review 9;14(2):272.

Available: <https://academic.oup.com/ajcn/article/83/4/870/4649206> [Accessed: 30 July 2021]

Ziegler A.M, Kasprzak C.M, Mansouri T.H, Gregory A.M, Barich R.A, Hatzinger L.A, Leone L.A, Temple J.L. 2021. An Ecological Perspective of Food Choice and Eating Autonomy Among Adolescents. *Front Psychol.*21:12.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.654139/full>. [Accessed 30 July 2022]

**APPENDICES**  
**APPENDIX A: QUESTIONNAIRE**

**NUTRITIONAL KNOWLEDGE, ATTITUDES AND PRACTICES OF  
ADOLESCENT GIRLS LIVING WITH HIV**

**SECTION A: DEMOGRAPHIC PROFILE**

Please indicate your response by putting a cross {x} on the statements provided

**1. Gender**

Female { }      Other specify \_\_\_\_\_ ---

**2. Age**

10 -14 { }

15 -19 { }

**3. Education level**

None { }      Informal { }

Primary school { }      Secondary/high school { }

Tertiary { }      Other specify \_\_\_\_\_

**4. Who provides food in the family?**

Parents { }      Guardians { }

Neighbour { }      Siblings { }

Myself { }      Other specify \_\_\_\_\_

**5. What is the source of income for the provider chosen above?**

Salary { }      Small business { }

Social grant { }      Pension benefit { }

Other specify \_\_\_\_\_

**6. Monthly income in Emalangeneni**

<500 { }      500 – 1000 { }

1001 – 3000 { }      3001 and 5000 { }

5001 -8000 { }      8001 and above { }

I don't know { }





No	Questions	SD	D	N	A	SA
1	Preparing a balanced meal is time consuming					
2	I need to eat a variety of foods so that my body gets all nutrients					
3	Healthy food is more expensive than unhealthy food					
4	It is not important to eat a balanced meal when already on ART					
5	A nutritious meal can come from one's own home backyard garden					
6	Vegetables are very important to keep the body healthy and fit					
7	I must over cook vegetables to kill microbes					
8	Animal protein is better than vegetable protein					
9	Hygiene is as important as food and nutrition					
10	I drink water at least 8 glasses (or 2L) of water per day					
12	Cutting and cleaning nails is a healthy behaviour					
13	Ideal body weight can be achieved by application of a balanced diet in everyday					

**iii) Nutritional Practices for adolescent girls living with HIV**

Please indicate your response by putting a cross (x) on the statements provided that better suit your attitude response; Strongly Disagree [SD]- 1, Disagree [D] -2, Neutral [N]-3, Agree [A]-4 Strongly Agree [SA] - 5

Questions	SA	D	N	A	SA
1. Every meal I eat needs to have a vegetable					
2. I need to consume coloured fruits					
3. Every meal needs to have a fruit and juice					
4. I eat snacks and junk foods at school					
5. I eat healthy to maintain a good immune system					
6. I cook all my meats using deep fat frying method					
7. I need to bath with soap and water					
8. I take a balanced meal before taking my ARV's					
9. I wash my hands with water and soap before and after eating food					

## SECTION C

### Nutritional self-efficacy for adolescent girl living with HIV

Please indicate your response by putting a cross (x) on the statements provided that better suit your attitude response: Strongly Disagree [SD]- 1, Disagree [D] -2, Neutral [N]-3, Agree [A]-4 Strongly Agree [SA] – 5

Question	SD	D	N	A	SA
1. I am well able to frequently prepare a balanced meal					
2. I am well able to make a balance food choice from a variety of food products					
3. I am well able to shop affordable healthy food					
4. I am well able to share good nutrition knowledge with my peers					
5. I am well able to drink at least 2L of water per day					
6. I am well able to exercise at least once a week					
7. I am well able to monitor my weight					
8. I am well able to wash my hands with soap water before and after eating					
9. I am well able to practice good personal hygiene including cutting of my nails					

## APPENDIX B: ETHICS APPROVAL ESWATINI



**ESWATINI  
HEALTH AND HUMAN  
RESEARCH REVIEW BOARD**  
MBANDZENI HOUSE, 3<sup>RD</sup> FLOOR, CHURCH STREET  
P.O. BOX 5, MBABANE, ESWATINI

### ONE YEAR RESEARCH PROTOCOL APPROVAL CERTIFICATE

BOARD REGISTRATION NUMBER	FWA 00026661/IRB 00011253				
PROTOCOL REFERENCE NUMBER	EHHRRB053/2021				
Type of review	Expedited	<input checked="" type="checkbox"/>		Full Board	
Name of Organization	<b>Masters Student</b>				
Title of study	Nutrition Knowledge, Attitudes and Practices of Adolescent Girls living with HIV in the Kingdom of Eswatini				
Protocol version	1.0				
Nature of application	New	Amendment	Renewal	Extension	CT updates
	<input checked="" type="checkbox"/>				
List of study sites	Mbilkwakhe Clinic, Baylor Clinic, Cabrini Ministries, Mafutseni Clinic, Ngculwini Nazarene Clinic and Good Shepherd				
Name of Principal Investigator	<b>Ms. Nomathemba Priscilla Siboza</b>				
Names of Co- Investigators	N/A				
Names of steering committee members in the case of clinical trials	N/A				
Names of Data and Safety Committee members in the case of clinical trials	N/A				
Level of risk (Tick appropriate box)	Minimal	More than minimal		High	
	<input checked="" type="checkbox"/>				
Initial study Approval information	Approved	<input checked="" type="checkbox"/>	Study completion date	30/12/2021	Certificate expiry Date
	Approval date	18/08/2021			18/08/2022
Study renewal approval information	Renewal date				End date
Study amendment approval information	Amendment date				
Study extension approval information	Extension date				End date
Signature of Chairperson					
Signing date	18/08/2021				
Secretariat Contact Details	Name of contact officers	<b>Babazile Shongwe</b>			
	Email address	ehhrrbeswatini@gmail.com			
	Telephone no.	(00268) 2404 7751/9553			



## APPENDIX C: ETHICS APPROVAL UNIVERSITY OF WESTERN CAPE



UNIVERSITY of the  
WESTERN CAPE



22 June 2021

Ms N Siboz  
Dietetics and Nutrition  
Faculty of Community and Health Science

**Ethics Reference Number:** BM21/4/11

**Project Title:** Nutrition knowledge, attitudes and practices of adolescent girls living with HIV in the Kingdom of Eswatini.

**Approval Period:** 17 June 2021 – 17 June 2024

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report annually by 30 November for the duration of the project.

Permission to conduct the study must be submitted to BMREC for record-keeping.

The Committee must be informed of any serious adverse event and/or termination of the study.

A handwritten signature in black ink, appearing to read 'Patricia Josias'.

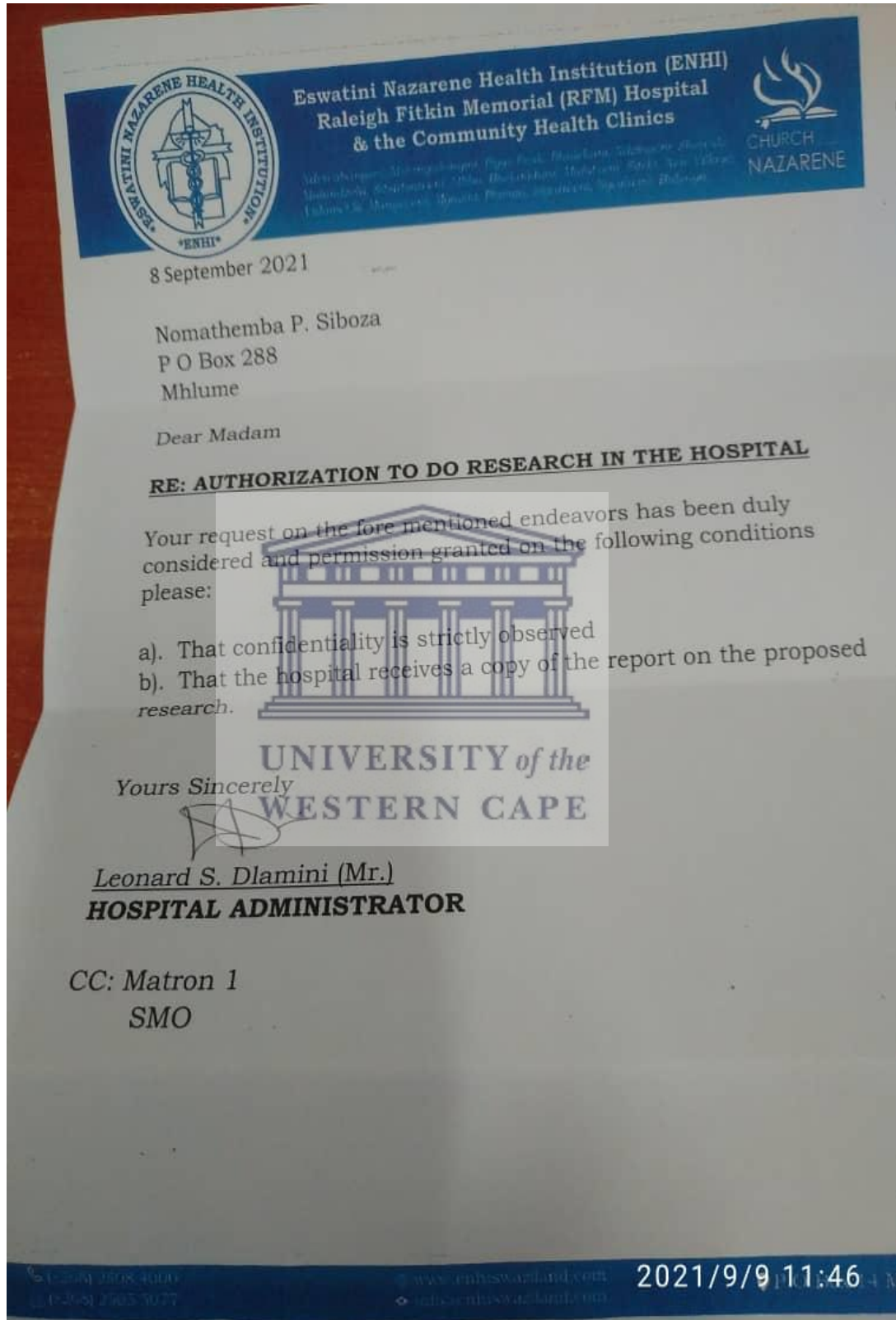
Ms Patricia Josias  
Research Ethics Committee Officer  
University of the Western Cape

NHREC Registration Number: BMREC-130416-050

Director: Research Development  
University of the Western Cape  
Private Bag X 17  
Bellville 7535  
Republic of South Africa  
Tel: +27 21 959 4111  
Email: research-ethics@uwc.ac.za

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

**APPENDIX D: DATA COLLECTION APPROVAL FOR HEALTH FACILITIES**





Corner / Somhlolo and Sigwili St.  
Kent Rock, Mbabane, Eswatini  
PO Box 110  
Mbabane.  
H100. Eswatini  
Phone: (+268) 24096000/24040133  
Fax: (+268) 24040214  
Email: info@baylorswaziland.org.sz

REF: ED0134

26 October 2021

Ms. Nomathemba Sibozza  
P.O. Box 288  
Mhlume  
L302

Dear Ms. Sibozza

**RE: PERMISSION FOR CONDUCTING RESEARCH**

Your letter dated 12 October 2021, received on 12 October 2021 on the above subject, refers.

Given both the Eswatini Health and Human Research Review Board (EHHRRB) and Baylor Institute Review Board (BCM-ES IRB) approvals, Baylor College of Medicine Children's Foundation Eswatini grants you permission to conduct a research study on the subject "**Nutrition Knowledge, Attitudes and Practices of Adolescent Girls living with HIV in the Kingdom of Eswatini**"

Once again thank you for your interest in conducting the research study at Baylor Eswatini, wishing you all the best.

Yours Sincerely

**Dr. Bhukumusa Lukhele**  
Executive Director



Romania • Botswana • Lesotho • Malawi • Eswatini • Uganda • Tanzania  
Papua New Guinea • Angola • Colombia • Argentina

[www.BIPAI.org](http://www.BIPAI.org)



## APPENDIX E: INFORMATION SHEET- ENGLISH



### UNIVERSITY OF THE WESTERN CAPE FACULTY OF COMMUNITY HEALTH SCIENCES

Private Bag X17, Bellville, 7535 Tel: +27 21 9592760

UNIVERSITY of the  
WESTERN CAPE

Email : [soph-comm@uwc.ac.za](mailto:soph-comm@uwc.ac.za)

### INFORMATION SHEET

#### **Project Title: Nutrition Knowledge, Attitudes and Practices of Adolescent Girls livingwith HIV in the Kingdom of Eswatini**

What is this study about?

This is a research project being conducted by Nomathemba Sibozza a student at the University of the Western Cape. We are inviting you to participate in this research project because you have been identified as a suitable respondent for this research project. The study seeks to investigate the nutritional knowledge, attitudes, and practices and their relationship with socio-demographic characteristics of adolescent girls living with HIV in the Kingdom of Eswatini Manzini region. Your participation in the study will be useful since it will assist the researcher to gather evidence that will be used for future HIV and nutrition programmes that will benefit adolescent girls like you.

What will I be asked to do if I agree to participate?

You are requested to complete the provided questionnaire which will take about 20 minutes of your time. This questionnaire is divided into four sections; the first part will aim at accessing the demographic information, the second part will ask nutrition knowledge questions using true, false, or do not know responses, the third and fourth sections will establish attitudes and practices of adolescent girls living with HIV using a 5 point Likert scale which will range from 5= strongly disagree, 4=disagree, 3=neutral, 2=agree, 1= strongly agree Your participation in this regard



is highly appreciated but voluntary. Should you decide not to complete the questionnaire, no one will know and you will not be at risk of losing any benefits otherwise due to you.

Would my participation in this study be kept confidential?

To ensure your confidentiality, you do not have to fill in personal identifying information on the questionnaire. The collected questionnaires will be stored in a lockable cabinet. The information from the questionnaire will be stored in password-protected computer files.

If we write a report or article about this research project, information will be reported for the group and not for any individual identifying characteristics.

By legal requirements and/or professional standards, we will disclose to the appropriate individuals and/or authorities' information that comes to our attention concerning child abuse or neglect or potential harm to you or others. In this event, we will inform you that we have to break confidentiality to fulfill our legal responsibility to report to the designated authorities.

What are the risks of this research?

There are low risks associated with participating in this research study. All human interactions and talking about self or others carry some number of risks. We will nevertheless minimize such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator learn more about Nutrition knowledge, attitudes, and Practices of Adolescents living with HIV. We hope that, in the future, other people might benefit from this study through the application of our improved understanding of the subject in programmes for adolescent girls living with HIV.

Your participation in this research is completely voluntary. You may choose not to

take part at all. If you decide to participate in this research, you may simply stop answering the questionnaire or return a blank form to the drop-box. The front page of the questionnaire will have a blank cover so that it will not be possible for somebody else to see if you have responded. The drop-box is sealed and will be opened by the researcher herself.

What if I have questions?

This research is being conducted by **Nomathemba P Siboz** from the **department of Dietetics and Nutrition** at the University of the Western Cape. If you have any questions about the research study itself, please contact **Professor Rina Swart** [supervisor] at **email: rswart@uwc.ac.za**

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Biomedical Research Ethics Committee

University of the Western Cape

Private Bag X17,

Bellville 7535

Tel: 021 959 4111

Email: [research-ethics@uwc.ac.za](mailto:research-ethics@uwc.ac.za)



Principal Investigator

Nomathemba P. Siboz

P.O.BOX 288

Mhlume

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Email: [sibozanomathemba@gmail.com](mailto:sibozanomathemba@gmail.com)

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e-mail: [research-ethics@uwc.ac.za](mailto:research-ethics@uwc.ac.za)

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The Ministry of Health  
EHHRRB Secretary  
Tel: 2404810  
Cell: 7605 4727



BMREC PROJECT ETHICS APPROVAL REFERENCE NUMBER: BM21/4/11

EHHRRB ETHICS APPROVAL REFERENCE NUMBER: EHHRRB053/2021

UNIVERSITY of the  
WESTERN CAPE

## APPENDIX F: INFORMATION SHEET-SISWATI

UNIVERSITY OF THE WESTERN CAPE FACULTY OF COMMUNITY AND



UNIVERSITY of the  
WESTERN CAPE

### HEALTH SCIENCES

Private Bag X17, Bellville, 7535 Tel: +27 21 9592760

Email : [soph-comm@uwc.ac.za](mailto:soph-comm@uwc.ac.za)

### LWATI LOLUMAYELANA NELUCWANINGO

**Sihloko Selucwaningo: Lwati lolumayelana netekondleka, simo nendlela yekwenta**

**Tintfo kwetintfombi letiphila neligciwane le HIV eveni laseSwatini**

Lolucwaningo lolu lwentiwa ngu Nomathemba Sibozwa umfundzi wase University yase Western Cape. Uyamenywa kutsi ube yincenye yalolucwaningo ngoba ungulomunye wemalunga elicembu lemantfombatana lokhetfwe ngoba ungulomunye lolulungele lolucwaningo. Lolucwaningo luhlose kutfola kabanti lwati lolumayelana netekondleka, simo indlela yekwenta tintfo kanye nebudlelwane betemphilo betintfombi letiphila ne ligciwane le HIV eveni lase Swatini.

Lwati ngetekondleka, simo nekwenza kwalabasha labaphila neligciwane leHIV luyadzingeka kulolucwaningo ngoba luncane lucwaningo lolwentiwe ngelwati ngetekondleka, simo nekwenza kwalabasha labaphila neligciwane leHIV eveni lase Swatini. Imibiko letfolakele ikhombisa kutsi kwesela lwati ngetekondleka ngiko loku yimbangela yesimo lesikabi etindzabeni tetekondleka. Ngakoke, lolucwaningo lufuna luvala tikhala letikhona elwatini letekondla luphindze lusite labo labenta tinhlelo ngelwati lolunebufakazi.

Uyacelwa kutsi uphendvule imibuto letawutsatsa imizuzu lengemashumi lamabili. Lemibuto yehlukene tigaba letine; sigaba sekucala sidzinga iminingwane yalobutwako, sigaba sesibili sifuna lwati lwalabasha, sigaba sesitsatfu nesesine sitawubuka, indlela yekwenta tintfo yalabasha labangemantfombata labaphila neligciwane le HIV bese kwekugcina yindlela labententela ngayo. Kubayincenye kwakho kulolucwaningo kuyabongeka kakhulu.

Kuciniseka kuvikeleka kwakho, yonkhe imininigwane/timphendvulo takho titawugcinwa ngalokuphephile uma sicedza. Khonkhe lokubhalwe phansi lolumayelana nalenkhulumiswano kutawuvalelwa, tiginawe ebhokisini lelitsite lelikhiywako, lapho kutawukhokhwangekusebentisa inombolo letsite lengatiwa ngulomunye umuntfu. Uma sibhala umbiko

ngalolucwaningo, ligama lakho ngeke livele. Mayelana nemtsetfo noma ngelizinga letemfundvo, sitawutjela labo lesibona kutsi bahlukubetekile, abakanakekeleki noma basengotini letsite kini noma kulabanye. Uma sikwenta loko, sitakutjela kute sitogcwalisa umtsetfo wekubika kubo betemtsetfo labakhulu.

Lolucwaningo alukentelwa kusita wena sicu sakho kuphela, kodvwa lemiphumela itosita kutfolalwati, ngesimo, nendlela yekwenta etindzabeni tetekondleka kwalabasha labaphila neligciwane leHIV. Siyetsemba kutsi, ngalelinye lilanga, labanye bantfu batawuzuza kulocwaningo ngekucondza kancono kwalesihloko lesicwaningiwe. Awukaphoceleleki kuba yincenya yalolucwaningo, Ungakhetsa kungabi yincenye yalo. Uma ukhetsa kuba yincenye yalolucwaningo, uvumelekile kuyekela noma nini uma sewufuna. Uma ukhetsa kungabiyincenye yalolucwaningo noma uma uyekela emkhatsini, ngeke ujeziswe noma ulahlekelwe lutfo.

Uma nginemibuto?

Lolucwaningo lwentiwa ngu Nomathemba P.Siboza lochamuka ku eluhlangotsini lwe tekondleka e Nyuvesi yase Western Cape. Uma unemibuto mayelana nalolucwaningo, tsintsana na Professor Rina Swart (supervisor] at email: rswart@uwc.ac.za.

Uma kwenteka uba nemibuto mayelana nalolucwaningo kanye nekufuna kwati ngemalungeloakho, noma ufuna kubika lokungahambi kahle, tsintsana na:

Biomedical Research Ethics Committee

University of the Western Cape

Private Bag X17,

Bellville 7535

Tel: 021 959 4111

Email: [research-ethics@uwc.ac.za](mailto:research-ethics@uwc.ac.za)

Principal Investigator  
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P.O.BOX 288  
Mhlume  
Tel: 76448845  
Email: [sibozanomathemba@gmail.com](mailto:sibozanomathemba@gmail.com)

The Ministry of Health  
EHHRRB Secretary  
Tel: 2404810  
Cell: 7605 4727  
E mail: babazileshongwe@gmail.com

BMREC PROJECT ETHICS APPROVAL REFERENCE NUMBER: BM21/4/11  
EHHRRB ETHICS APPROVAL REFERENCE NUMBER: EHHRRB053/2021



## APPENDIX G: CONSENT FORM

### UNIVERSITY OF THE WESTERN CAPE FACULTY OF COMMUNITY AND HEALTH SCIENCES



UNIVERSITY of the  
WESTERN CAPE

Private Bag X17, Bellville, 7535 Tel: +27 21 9592760

Email: [soph-comm@uwc.ac.za](mailto:soph-comm@uwc.ac.za)

### CONSENT FORM

#### **Title of Research Project: Nutrition Knowledge, Attitudes and Practices of Adolescent Girls living with HIV in the Kingdom of Eswatini**

This study seeks to investigate the nutritional knowledge, attitudes and practices and their relationship with socio-demographic characteristics of adolescent girls living with HIV in the Kingdom of Eswatini Manzini region. Therefore, you are requested to allow your child to be part of this study. This research study is a way to learn more about adolescent girls living with HIV nutrition knowledge, attitudes and practices. If you decide that your child becomes part of this study, you will be asked to allow her to attend the monthly health facility adherence teenclub and sign in the below space for your permission.

UNIVERSITY of the  
WESTERN CAPE

When we are finished with this study, we will write a report about what was learned. This report will not include your child's name or that you were in the study. However, your child is not forced to participate in this study if you do not want her to participate you are allowed to do so. If you decide to stop after we begin, you will be allowed to do so.

I hereby agree that \_\_\_\_\_ (*child's name and surname*) participates in the above-mentioned study.

OR

I hereby disagree that \_\_\_\_\_ (*child's name and surname*) participates in the above-mentioned study

**Parent / Guardian name** .....

**Parent / Guardian signature** .....

**Date** .....

Biomedical Research

Ethics Committee

University of the

Western Cape

Private Bag

Belville

7535

Tel: 021 959 4111

e-mail: [research-ethics@uwc.ac.za](mailto:research-ethics@uwc.ac.za)

Principal Investigator

Nomathemba P. Siboz

P.O.BOX 288

Mhlume

Tel: 76448845

E-mail: [sibozanomathemba@gmail.com](mailto:sibozanomathemba@gmail.com)





The Ministry of Health

EHRRB Secretary

Tel: 2404810

Cell: 7605 4727

E-mail: babazileshongwe@gmail.com

BMREC PROJECT ETHICS APPROVAL REFERENCE NUMBER: BM21/4/11

EHRRB ETHICS APPROVAL REFERENCE NUMBER: EHRRB053/2021



UNIVERSITY *of the*  
WESTERN CAPE



UNIVERSITY *of the*  
WESTERN CAPE

## APPENDIX H: CONSENT FORM -SISWATI

### UNIVERSITY OF THE WESTERN CAPE FACULTY OF COMMUNITY AND HEALTH SCIENCES



Private Bag X17, Bellville, 7535 Tel: +27 21 9592760

UNIVERSITY of the  
WESTERN CAPE

Email: [soph-comm@uwc.ac.za](mailto:soph-comm@uwc.ac.za)

#### **Sihloko Selucwaningo: Lwati lolumayelana netekondleka, simo nendlela yekwenta**

#### **Tintfo kwetintfombi letiphila neligciwane le HIV eveni laseSwatini.**

Lolucwaningo lucondze kutfola **lwati** lolumayelana netekondleka, simo nendlela yekwenta tintfo kwetintfombi letiphila neligciwane le HIV eveni laseSwatini. Ngakoke, uyacelwa kutsi uvumele umntfwana wakho kutsi abeyincenye yalolucwaningo. Lolucwaningo lolu luyindlelayekwati kabanti ngemntfwana wentfombatana lophila neligciwane leHIV, lwati ngetekondleka kanye nendlela yekwenta tintfo. Uma uvuma kutsi umntfwana wakho abeyincenye yalolucwaningo, uyacelwa kutsi umvumele kutsi ete emihlanganweni yelicembu labo labetsembekile ekunatseni emaphilisi ekutsintsibalisa ligciwane le HIV njalo ngenyanga emfolamphilo. Uyacelwa kutsi usayine kulesikhala lesingentansi kukhomba kutsi uyamvumela.

Uma sicedza ngalolucwaningo, sitawubhala umbiko ngaloko lesikufundzile. Lombiko ngeke ulivete libito lemntfwana wakho nekutsi nawe uke waba yincenye yalolucwaningo. Ngakoke, umntfwana wakho akaphoceleleki kuba yincenye yalolucwaningo uma ungavumi. Uma ucabanga kumykelisa noma sesicalile, uvumelekile kukwenta loko.

Nguyavuma kutsi \_\_\_\_\_ (*Libito lemntfwana nesibongo*) abeyincenye yalolucwaningo

Noma

Angivumi kutsi \_\_\_\_\_ (*Libito lemntfwana nesibongo*)  
abeyincenye yalolucwaningo

Libito Lemtali .....

Kusayina Lolocwaningwako.....

Lusuku .....



UNIVERSITY *of the*  
WESTERN CAPE

Biomedical Research  
Ethics Committee  
University of the  
Western Cape

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X17

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7535

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Principal Investigator

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The Ministry of Health

EHHRRB Secretary

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BMREC PROJECT ETHICS APPROVAL REFERENCE NUMBER: BM21/4/11

EHHRRB ETHICS APPROVAL REFERENCE NUMBER: EHHRRB053/2021

**APPENDIX I: ASSENT FORM-ENGLISH**



**UNIVERSITY OF THE WESTERN CAPE FACULTY OF  
COMMUNITY HEALTH SCIENCES**

UNIVERSITY of the WESTERN CAPE  
Bag X17, Bellville, 7535 Tel: +27 21 9592760 Email: [soph-comm@uwc.ac.za](mailto:soph-comm@uwc.ac.za)

**ASSENT FORM**

**Title of Research Project: Nutrition Knowledge, Attitudes and Practices of Adolescent Girls living with HIV in the Kingdom of Eswatini**

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

**Participant's name** .....

**Participant's signature** .....

**Date** .....

Biomedical Research Ethics Committee University of the Western Cape  
Private Bag X17 Bellville  
7535  
Tel: 021 959 4111  
E-mail: [research-ethics@uwc.ac.za](mailto:research-ethics@uwc.ac.za)

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The Ministry of Health

EHHRRB Secretary

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E-mail: [babazileshongwe@gmail.com](mailto:babazileshongwe@gmail.com) BMREC PROJECT ETHICS APPROVAL

REFERENCE NUMBER: BM21/4/11

EHHRRB ETHICS APPROVAL REFERENCE NUMBER: EHHRRB053/2021



UNIVERSITY *of the*  
WESTERN CAPE

## APPENDIX J: ASSENT FORM- SISWATI

### UNIVERSITY OF THE WESTERN CAPE FACULTY OF COMMUNITY AND HEALTH SCIENCES



UNIVERSITY of the  
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Private Bag X17, Bellville, 7535 Tel: +27 21 9592760

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#### LIFOMULE SIVUMELWANO

**Sihloko Selucwaningo: Lwati lolumayelana netekondleka, simo nendlela yekwenta tintfo kwetintfombi letiphila neligciwane le HIVeveni laseSwatini**

Konkhe sengichazelwe kabanti ngelulwimi lengikucondzako. Yonkhe imibuto lebenginayo mayelana nalolucwaningo seyiphendvuliwe. Ngiyacondza kutsi kuba yincenye kwami kulolucwaningo kutokwenteka ngemvumo yami. Ngiyacondza kutsi iminingwane ngami ngeke ivetwe nakunoma ngubani. Ngiyacondza futsi kutsi ngingayekela kuchubeka nalolucwaningo uma ngifuna ngaphandle kwesizatfu nangaphandle kwekwesaba.

**Libito lalobutwako.....**

**Sayina lobutwako.....**

**Lusuku.....**

Biomedical Research  
Ethics Committee  
University of the  
Western Cape

Private Bag X1

Bellville 7535

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E-mail: [research-ethics@uwc.ac.za](mailto:research-ethics@uwc.ac.za)



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The Ministry of Health  
EHHRRB Secretary  
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BMREC PROJECT ETHICS APPROVAL REFERENCE NUMBER: BM21/4/11

EHHRRB ETHICS APPROVAL REFERENCE NUMBER: EHHRRB053/2021



**Appendix K: Nutritional Knowledge for adolescent girls attending adherence clubs**

Variable	TRUE				FALSE				Don't know				Total	
	10-14	N 79	15-19	N 154	10-14	N 79	15-19	N 154	10-14	N 79	15-19	N 154	N233	100%
I can eat maize as my energy food	28.3%	66	61.4%	143	1.7%	4	1.3%	3	3.86%	9	3.4%	8	233	100
Nutrients (protein, carbohydrates, vitamins & minerals) cannot be provided by one kind of food	16.3%	38	37.3%	87	6.9%	16	12%	28	10.7%	25	16.7%	39	233	100
I can replace rice with bread	23.6%	55	48.9%	114	6.9%	16	11.6%	27	3.4%	8	5.6%	13	233	100
Vegetables and fruits are sources of vitamins and minerals	10.3%	24	57%	133	16.3%	38	4.7%	11	7.3%	17	7.3%	10	233	100
If I eat cheap fruits, I get fewer vitamins	14.5%	34	16.3%	38	12%	28	37.8%	88	12%	28	7.3%	17	233	100
When I do not eat animal protein, I can replace it with plant protein	17.6%	41	32.6%	76	7.7%	18	13.3%	31	8.5%	20	20.1%	47	233	100
High fiber food is dangerous for people living with HIV	9.9%	23	16.3%	38	11.2%	26	24.9%	58	12.9%	30	24.9%	58	233	100
HIV is a result of poor nutrition	8.2%	19	7.3%	17	18%	42	42%	98	7.7%	18	16.7%	39	233	100
Antioxidants are poisonous for People Living with HIV	9%	21	9.9%	23	15.9%	37	33.5%	78	9%	21	22.7%	53	233	100
It is important to wash my hands with soap and water to prevent infectious diseases	30.9%	72	63.9%	149	1.7%	4	0.85%	2	1.3%	3	1.3%	3	233	100
It is important for me to eat healthy foods every day	31.8%	74	63.5%	148	1.3%	3	0.855	2	0.85%	2	1.7%	4	233	100

*\*Note: All correct answers are marked in grey colour\**

## Appendix L: Nutrition attitudes of adolescents attending adherence clubs

Variable	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		Percent age		N=233
	%	N	%	N	%	N	%	N	%	N	%	N	
Preparing a balanced meal is time-consuming	9.0	21	14.2	33	12.4	29	21.5	50	42.9	100	100	233	
I need to eat a variety of foods so that my body gets all nutrients	31.3	73	39.9	93	14.2	33	9.0	21	5.6	13	100	233	
Healthy food is more expensive than unhealthy food	13.7	32	15.9	37	33.9	79	18.0	42	18.5	43	100	233	
It is important to eat a balanced when already on ART	13.7	32	6.4	15	8.6	20	24.9	58	46.3	108	100	233	
A nutritious meal can come from one's home backyard garden	45.1	105	31.3	73	6.0	14	8.2	19	9.4	22	100	233	
Vegetables are important to keep the body healthy and fit	56.1	131	25.3	59	9.4	22	3.4	8	5.6	13	100	233	
I must overcook vegetables to kill microbes	20.2	47	13.3	31	20.6	48	16.3	38	29.6	69	100	233	
Animal protein is better than vegetable protein	8.2	19	14.2	33	39.5	92	21.9	51	16.3	38	100	233	
Hygiene is as important as food and nutrition per day	43.8	102	34.3	80	11.2	26	6.0	14	4.7	11	100	233	
I drink water at least 8 glasses (or 2L) of water per day	35.2	82	24.0	56	24.9	58	7.7	18	8.2	19	100	233	
Cutting and cleaning nails is a healthy behavior	45.1	105	33.5	78	11.2	26	6.0	14	4.3	10	100	233	
Ideal body weight can be achieved by the application of a balanced diet in everyday	35.6	83	36.5	85	15.9	37	6.4	15	5.6	13	100	233	

\*All correct attitudes are highlighted in grey color\*

**Appendix M: Nutrition practices of adolescent girls attending adherence clubs**

Variable	Strongly Agree		Agree		Neutral		Disagree		Strongly disagree		Total	
	%	N	%	N	%	N	%	N	%	N	%	N
Every meal I eat needs to have a vegetable	33.5	78	41.6	97	10.3	24	6.4	15	8.2	19	100	233
I need to consume colored fruits	20.6	48	36.9	86	23.6	55	12.0	28	6.9	16	100	233
Every meal needs to have a fruit and juice	23.6	55	37.3	87	22.7	53	9.9	23	6.4	15	100	233
I eat snacks and junk foods at school	13.7	32	14.2	33	24.0	56	19.7	46	28.3	66	100	233
I eat healthy to maintain a good immune system	46.4	108	32.2	75	9.9	23	6.0	14	5.6	13	100	233
I cook all my meats using the deep fat frying method	9.0	21	13.3	31	17.6	41	24.9	58	35.2	82	100	233
I need to bath with soap and water	42.9	100	38.6	90	6.9	16	5.2	12	6.4	15	100	233
I take a balanced meal before taking my ARVs	37.8	88	39.5	92	10.3	24	6.0	14	6.4	15	100	233
I wash my hands with water and soap before and after eating foods	57.9	134	30.9	72	4.3	10	2.6	6	4.3	11	100	233

*\*All desirable practices are highlighted in grey color*

**Appendix N: Nutrition practices of Self-efficacy of adolescent girls attending adherence clubs**

Variable	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Total	
	%	N	%	N	%	N	%	N	%	N	%	N
I am well able to frequently prepare a balanced meal	23.6	55	38.2	89	18.9	44	9.4	22	9.9	23	100.0	233
I am well able to make a balanced food choice from a variety of food products	23.6	55	45.9	107	16.7	39	9.4	22	4.3	10	100.0	233
I am well able to shop for affordable healthy food	21.9	51	33.5	78	25.8	60	11.2	26	7.7	18	100.0	233
I am well able to share good nutrition knowledge with my peers	27.9	65	43.3	101	13.7	32	9.0	21	6.0	14	100.0	233
I am well able to drink at least 2L of water per day	16.3	38	36.9	86	28.3	66	8.6	20	9.9	23	100.0	233
I am well able to exercise at least once a week	27.9	65	40.8	95	18.9	44	9.4	22	3.0	7	100.0	233
I am well able to monitor my weight	23.2	54	40.3	94	19.7	46	12.4	29	4.3	10	100.0	233
I am well able to wash my hands with soap water before and after eating	46.4	108	39.1	91	7.3	17	4.3	10	3.0	7	100.0	233

I am well able to practice good personal hygiene including cutting of my nails	52.4	122	34.3	80	5.6	13	4.7	11	3.0	7	100.0	233
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*\*All correct practices are highlighted in grey color\**

**Appendix O: Nutrition knowledge gaps for adolescents living with HIV**

	<b>%Value of fruits</b>	<b>%Protein replacement</b>	<b>%High fiber food</b>	<b>%Antioxidants</b>
10 -14 years	54	71	23	53
15- 19 years	43	75	20	49

