

**UNIVERSITY OF WESTERN CAPE**  
**FACULTY OF COMMUNITY AND HEALTH SCIENCES**  
**Mini - Thesis**

**TITLE: IMPACT OF KNOWLEDGE GAINED FROM ADOLESCENTS' PUBERTY  
BOOKS ON KNOWLEDGE AND ATTITUDES TOWARDS PUBERTY  
DEVELOPMENT CHANGES AMONG VERY YOUNG ADOLESCENT LEARNERS IN  
MALAWI**

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## **ABSTRACT**

**Introduction:** A distinct subgroup of adolescents, very young adolescents (VYA) aged 10 to 14 are going through one of the most important life transformations. For adolescents to develop the healthy behaviors that can influence their present and future health, well-being, and ability to avert hazards like early, unwanted pregnancies, sexually transmitted illnesses, and gender-based violence, they require knowledge, skills, and social support. Save the Children, in collaboration with the Malawian government through the Ministries of Health and Education, developed puberty workbooks to be used with in- and out-of-school youth to complement life skills education.

**Methodology:** This research assessed the impact of the puberty books on VYA's knowledge and attitudes toward puberty and the associated physical changes and their level of confidence to manage the changes in Blantyre urban schools. A pre and post exposure study design was used among VYA in 10 sampled schools. The study used McNemar's exact test for matched pairs to test the observed difference in the outcomes before and after reading the puberty book. Ethical clearance was obtained. Assent was acquired from caregivers and consent from the VYA.

**Findings:** The findings indicated that knowledge about puberty and attitudes to puberty were low at baseline. After the intervention, VYA showed a significant increase in knowledge about body development and changes during puberty. Attitudes also changed. In addition, VYA reported being able to talk with their parents about issues and staying in school despite menses. There were variations on knowledge change among boys and girls on HIV transmission and gender norms.

**Conclusion:** VYA were demonstrated to report improved knowledge in almost all areas assessed after the intervention. The results provided enough evidence to suggest that puberty books are a good source of information on puberty development stages among adolescent girls and boys and may result in beneficial outcomes for VYA.

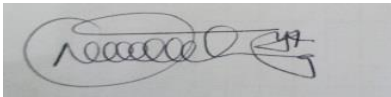
## DECLARATION

I declare that **Impact of knowledge gained from adolescents' puberty books on knowledge and attitudes toward puberty development changes among very young adolescent learners in Malawi** is my work, 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:** Nennie Harvey Lungu

**Date:** December 2022

Signed

A rectangular box containing a handwritten signature in black ink. The signature is cursive and appears to read 'Nennie Harvey Lungu'.

## **ACKNOWLEDGEMENTS**

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## **CHAPTER 1: INTRODUCTION**

### ***1.1 Background***

Around 1.2 billion adolescents are present worldwide, with nearly 90% of them residing in low and middle- income countries (LMICs) (Patton G et al, 2016). Half of those are Very Young Adolescents (VYA) between the age range of 10 to fourteen years (Woog, 2017). According to Blakemore (2012), adolescence is a period when adolescents undergo a lot of physical and emotional adjustments and experiences. One of these is puberty, with changes such as speedy physical development, adjustments in the face structure and appearance of auxiliary characteristics.

Puberty is defined as "the time of life when the body begins making adult levels of sex hormones and the young person takes on adult body characteristics" (WHO, 2017, p.A-19). According to a report by UNICEF (2019), during puberty VYA take on additional responsibilities, experiment with new ways of doing things and push for independence. According to the American Academy of Pediatrics (2019), puberty is characterized by the onset of physical changes, including the development of secondary sexual characteristics such as breast development in girls and testicular growth in boys, and the production of sex hormones. For females, menarche marks the beginning of reproductive capability, while for males, spermarche and semenarche signal the onset of fertility. Females typically start puberty between the ages of 10 and 11 (the exact age varies based on several factors, such as nutrition), whereas men often start puberty a year later.

Every human being undergoes puberty, which is merely a time of heightened physical and sexual development, but because young adolescents are unprepared for it, they are left insecure and unsupported. As a result, they lack information on how to deal and cope with the body changes

which if not properly taken care of leads to early sexual debut, unwanted pregnancies, contracting sexually transmitted infections and dropping out of school. (UNESCO, 2014).

According to Wiley (2000), “adolescence is a time of exploring one's identity and one aspect which is frequently explored is sex and sexuality”. Girls and boys during puberty start to explore with their sexual feelings and behaviours; they may also experience unwanted or coerced sexual acts (Allen, 2001). According to Igras (2014), inequitable sexual and gender norms typically govern these early expressions of sexuality especially in LMICs. Girls are typically expected to wait until marriage before engaging in sexual activity whereas boys are typically urged to show their manhood by engaging in it early(Igras, 2014).

Puberty education among very young adolescents is often considered a taboo topic in many cultures and communities. However, early puberty education can have significant benefits, such as empowering young children to make informed decisions about their bodies and relationships.

Research has shown that early puberty education can positively impact young children's understanding of their bodies and their ability to communicate their boundaries. A study by Kirby et al. (2010) found that young children who received comprehensive puberty education were more likely to understand the physical and emotional aspects of relationships and to communicate their boundaries effectively.

Despite the potential benefits of early puberty education, many parents and educators are reluctant to broach the topic with very young children. There are several reasons for this, including cultural norms, religious beliefs, and a lack of knowledge about how to approach the subject in an age-appropriate manner.



In addition, some parents and educators may be concerned about exposing young children to sexual content prematurely. However, age-appropriate sex education can be delivered in a way that is respectful and empowering for young children (American Academy of Pediatrics, 2018).

Efforts are being made to increase awareness and understanding of the importance of early puberty education. Organizations like Planned Parenthood and the American Academy of Pediatrics recommend puberty education for children as young as preschool age.

Puberty begins at a time when many adolescents are still enrolled in school. Given that the majority of learners attend primary school but are at risk of dropping out in later years, this period that somewhat precedes or coincides with puberty seems the ideal place and moment to educate them about puberty. (UNESCO, 2014).

Furthermore, according to the WHO (2010), the schools have a large, educated workforce, that can, if properly trained, provide accurate knowledge and develop a relationship of trust with students. The school setting promotes relationships and social interaction with peers and teachers or other school staff, which can lead to a feeling of school connectedness (the feeling that someone in a young person's school cares about his or her well-being). This factor can have a positive impact on school performance; it can mitigate school drop-out, early sexual initiation, risky sexual activity, violence and substance use (WHO, 2010). Higher levels of education have been linked with improved sexual and reproductive health outcomes, including delayed early sexual debut, childbirth, and also necessitating contraceptive use. (Mmari & Sabherwal, 2013).

According to the 2016 Malawi Demographic Health Survey (MDHS), VYA contribute 13.9% of the population living in urban Malawi. Evidence has shown that in Malawi, sexuality related issues are regarded as confidential; therefore, discussing such issues is considered obscene or taboo (Mensch, et al., 2010). Consequently, the rate of unintended teenage pregnancy, maternal mortality

and sexually transmitted infections (STI's) including HIV remain high, even among adolescents (Geloo, 2009). Adolescents may become sexually active and therefore improving their knowledge about sexuality and other measures to preventing STIs, HIV and unintended pregnancies is necessary (Relic, 2012). In line with this thinking, the donor community in Malawi, through Save the Children in collaboration with the Malawian government, developed puberty books, as an intervention to provide information to boys and girls attending primary school in Blantyre urban district. The books cover all the key information about developmental changes that VYA experience when going through the puberty.

The assumption behind the intervention is that engagement with the puberty books will improve adolescents' self-reported ability to freely discuss topics related to sex, puberty and physical change, increase their knowledge about their own bodies and their sexual health and thus hopefully help them to obtain the information needed to inform decision-making regarding sex (UNESCO, 2014). Hence, assessing the impact made by the puberty books intervention is crucial, as this will help in ensuring that evidence-based programming decisions are made when scaling up such an intervention to other districts.

Since 1990, there has been more focused attention on SRH issues affecting adolescents in developing countries, followed by increases in policies and programmes to improve their situation (Eisenberg & Wagenaar, 1997). However, most efforts are directed at older youth and focused on HIV and pregnancy prevention, while the diverse circumstances and needs of younger adolescents, most of whom are dealing with emerging fertility and sexuality in the context of rapid puberty changes and not yet sexually active have been overlooked (Igras, 2014).

The government of Malawi through stakeholders therefore introduced the puberty books to supplement life skills education for VYA in urban Blantyre. No research has been conducted in

Malawi and little elsewhere, that assessed the impact of the puberty books on VYA knowledge of and attitudes toward puberty; the physical changes that occur during puberty and their level of confidence to manage the changes.

### ***1.2 Purpose of the study***

Findings from the study will aid in bridging the gap in the knowledge surrounding the impact of puberty education on VYA's levels of information in Malawi. The knowledge gained from the study ought to serve as a guide for future and expanded educational puberty interventions across the nation. In addition, donor community and the implementing partner who in this case is Save the Children can use the study's findings to guide its decisions with solid research data. Furthermore, findings will aid government through the Ministry of Education on how sexuality education could be administered in schools among VYA.

### ***1.3 Aim and objectives***

#### ***1.3.1 Aim***

The study's goal is to assess the impact of the puberty books on VYA's knowledge and attitudes toward puberty and the associated physical changes and their level of confidence to manage the changes in Blantyre urban schools.

#### ***1.3.2 Objectives***

The objectives of the study are to describe:

1. knowledge change of young adolescents over time regarding the physical changes that occur during puberty
2. attitudes of young adolescents regarding the physical changes that occur during puberty
3. knowledge of young adolescents on HIV transmission.
4. knowledge of young adolescents on menstrual hygiene management

#### ***1.4 The thesis's format***

There are six chapters in this thesis. The research study's introduction, including the study context, is provided in Chapter one. It also talks about the study's purpose and goals. An evaluation of literature on SRH education among VYA, sources of information and knowledge of puberty development changes among VYA in Malawi, sexual education in developing countries and a critical review of literature is presented in Chapter two. The study's methodology is described in the third chapter. It covers the study design, sample size and population, data collection techniques, data analysis, validity and reliability of the study. Additionally, ethical issues are also incorporated in this chapter. The study's results are presented in the fourth chapter. The study's findings are covered in the fifth chapter. Based on the findings, the final chapter formulates conclusions and suggestions.

## **CHAPTER 2: LITERATURE REVIEW**

This literature review describes the concept of sexual and reproductive health (SRH) schooling for VYA in Malawi, sources of information on knowledge of puberty development changes among VYA in Malawi, school-based sexual information programs in southern Africa, knowledge and practices of menstruation, other relevant studies on knowledge and attitudes of puberty development changes, and it also looks at a critical review on the current literature focused on knowledge of puberty among VYA.

### ***2.1 Sexual and Reproductive health among VYA in Malawi***

Malawi has one of the highest rates of teenage pregnancy in the world, with approximately 29% of young women aged 15-19 having begun childbearing (National Statistical Office (NSO) & ICF, 2017). This high rate of teenage pregnancy can be attributed to a lack of knowledge about sexual and reproductive health among very young adolescents in Malawi. In a qualitative study in Mangochi district, Malawi, Chimwaza et al. (2015) found that young people had limited knowledge of sexual and reproductive health, and that traditional beliefs and customs often prevented them from accessing information and services. Additionally, Mphonda (2016) found that factors such as poverty, low levels of education, and gender inequality also contribute to poor sexual and reproductive health outcomes among young people in Malawi.

Improving sexual and reproductive health knowledge and access to services is essential for reducing the high rates of teenage pregnancy and improving overall health outcomes for very young adolescents in Malawi. Manda-Taylor et al. (2017) found that in-school adolescents in rural Malawi lacked knowledge about sexual and reproductive health and faced barriers to accessing services, including distance, cost, and lack of privacy. Mwale et al. (2016) found that factors such as gender, education, and family processes were associated with sexual and reproductive health

behaviors among in-school adolescents in Malawi. Olenja et al. (2016) also found that parental control and family processes were important factors in determining sexual and reproductive health behaviors among in-school adolescents in Malawi.

Overall, these studies highlight the need for comprehensive sexual education programs and increased access to reproductive health services for very young adolescents in Malawi. Such programs should address the traditional beliefs and customs that prevent young people from accessing information and services and should take into account the socio-economic and cultural factors that affect sexual and reproductive health behaviors among young people

## ***2.2 Sexual and reproductive health schooling for VYA***

The main sources of SRH information for VYA in Malawi include health workers, teachers, the radio, traditional initiators, peers and friends (MOEST, 2012). Primary school attendance itself protects against early marriage and its accompanying health risks and allows passage to secondary school and its inherent individual and social benefits (Murphy & Carr, 2007). Schools that exist within cultures that condone physical discipline and violence, however, can also be places where children experience violence, ranging from teasing (e.g. about menstruation and developmental differences) and bullying, to sexual harassment or physical and sexual violence (UN, 2012).

If the school system discriminates against girls, or the school environment or travel to school is unsafe, young girls may be withdrawn, increasing their risk of premarital sex or early marriage (Mensch, et al., 2010). Community institutions such as schools, which should play a protective role, often have structural issues influenced by gender and cultural norms that diminish protection, particularly for girls in puberty.

Following evidence for the proven benefits of comprehensive sexuality education in diverse settings (Fonner, et al., 2014), UNESCO recently released guidelines outlining recommendations

for comprehensive sexuality education. However, most of the existing SRH interventions in low and middle-income countries, as well as most of the existing research, focuses on older adolescents (Fonner, et al., 2014). The SRH needs of VYA, those aged 10–14 years, are often neglected in research and action (WHO, 2010) and there are many gaps in understanding SRH of young adolescents, especially in sub-Saharan Africa (Albert et al., 2003). This younger age group may be the ideal target for SRH and puberty interventions, as their behaviours and norms are less rigid (Ministry of Education and Sports Uganda, 2018).

### ***2.3 Sources of information on knowledge of puberty development changes among VYA in Malawi***

In some countries, primary school curricula include formal sex education for VYA on knowledge of puberty development changes. However, sex education is still considered a taboo in many Malawian communities (MOEST, 2002). Bankole et al. (2017) found that 11% of Malawian adolescents ages 12–14 are already sexually active, showing that puberty information is indeed relevant for this young age group. In Malawi, parents hardly ever discuss sex with their children for the same reason. As a result, in Malawi, traditional figures such as aunts, uncles, and grandparents are chosen to speak with young girls and boys about sex and other related topics (Geloo, 2017). While these adults play a significant part in educating adolescents about their sexuality, it's important to encourage parents and adolescents to talk about puberty and other sex-related topics because some adolescents say it'd be better if they learned some of this knowledge from their parents (McAuliffe, 2016).

Amuyunzu-Nyamongo et al. (2015) in her qualitative study on sources of puberty information parents were brought up when she asked adolescents about their favorite information sources, but again, there were varied responses. In Burkina Faso, Ghana, and Uganda, some adolescents reported feeling ashamed or being afraid to question their parents about sexual and reproductive

health issues because they thought they would be humiliated or punished, or because their parents were harsh. Additionally, in Burkina Faso and Ghana, parents were said to be unknowledgeable, while in Malawi, parents were said to be unfree and closed-minded when dealing with adolescents. In Ghana, mothers were reportedly not to keep the information supplied a secret. This highlights the importance of utilizing puberty books as sources of information among adolescents. The puberty books also encourage adolescents to freely engage in discussion with their parents on puberty related issues.

#### ***2.4 School-based sexual and puberty information programs in southern Africa***

Strong evidence exists which has shown that quality school-based sexuality and puberty education programs have a positive impact on adolescent's knowledge and attitudes about sexuality and reproductive health, and many studies have reported on positive behavioural impacts as well. For example, a study by Traore (2017) of twenty-one school-based sex education programs in southern Africa including Malawi found that nearly all the programs had a positive influence on puberty knowledge, attitudes and led to safer behaviour. Similarly, a systematic review by Kirby (2018) on studies of curricula-based programs in southern Africa found that 72% of the programs had a positive impact on changing behaviour. Furthermore, in a study conducted by the WHO (2016) to grade programs for their effectiveness in reducing HIV among young people, assess that curriculum-based sexuality and puberty education program was recommended for widespread implementation (WHO, 2016).

Trudell (2020), states that when puberty information is pertinent to the requirements and preferences of its intended audience, it is accepted and used. Accordingly, a program designed to enlighten students about puberty in schools will be more effective if it is based on the requirements and preferences of the students as well as the area in which the school is located. Educators can



design a pertinent curriculum if they are aware of the amount of false information that is available as well as the level of interest in or expressed demand for particular types of knowledge (Wachira, 2000). By doing so, it will be possible to decide on the curriculum's subject matter and the proper age at which contentious material can be introduced. Additionally, it will be useful in determining the most effective teaching strategy. According to Loll (2016), puberty education provides specific content to adolescents undergoing puberty and hence equips them with appropriate sexual information and enabling the adolescents to make informed choices on sexuality issues.

### ***2.5. Knowledge and practices of menstruation***

The knowledge and practices of menstruation among VYA girls is very important anywhere else in the world because it is directly linked to reproductive health and puberty issues among VYA girls. Some of the relevant studies on knowledge and practices of menstruation among VYA girls are as follows.

According to Dasgupta & Sarkar (2008), the majority of adolescent girls in Ethiopia were not ready for their first menstrual period because they did not fully comprehend the physical process of menstruation. The study further demonstrates that many girls were uninformed about the underlying science of menstruation and good hygiene habits. The results of a cross-sectional survey conducted by WaterAid in 2009 of adolescent girls in four government secondary schools in Kenya regarding their level of awareness of the physiological processes involved in menstruation are consistent with those of the Dasgupta & Sarkar (2008) study. Most girls have heard about menstruation, but most of them did not understand how to manage it (Shanbhag, 2012).

Adolescent girls were found to be less prepared for the menstrual cycle than their peers in Western nations, according to Mutunda's (2013) descriptive study among young women. Approximately

53% of the girls felt ashamed when they got their first period, according to the survey, which showed that they had strong emotional reactions to the situation. The study suggested early menstrual education before puberty to emotionally prepare the girls. Adinma (2008) conducted a cross-sectional survey with 550 secondary school girls in Southern Nigeria. According to this study, schoolgirls' lack of understanding of menstruation is due to a lack of information. These findings demonstrate that understanding the female menstrual cycle is a crucial reproductive health concern for adolescent girls and that it should be included in school curriculum and at-home instruction to help girls manage their menstruation effectively and have healthy lives. (Thakre *et al*, 2011; Nagar & Aimol, 2011).

## ***2.6 Other relevant studies on knowledge and attitudes of puberty development changes***

A study by Woodcock *et al.* (1992) used a qualitative study design in the form of focus group discussion to collect data on puberty and sexual education in Tanzania. This was appropriate in the sense that a qualitative study design was able to unearth perception about the learners on sexuality education.

Another study by Tegegn, Yazachew & Gelaw (2008), which focused on understanding adolescents' attitudes and perceptions on using SRH services in Ethiopia indicated that the environment needs to be supportive in order to favorably affect adolescents' attitude, knowledge, , abilities perceptions, and behavior around the use of reproductive health services. Furthermore, the study highlighted that having good knowledge about puberty development among adolescents in Ethiopia facilitated access and use of SRH services.

A recent study by Yohannes (2016) found that adolescents with knowledge of puberty development and SRH services were more likely to use the services than those that did not have

knowledge about these services. The study also identifies the lack of privacy, unfriendly teachers, and the limited capacity of schools to provide information about puberty and SRH services with convenient hours or locations as some of the key barriers to using these services by adolescents. In addition, parents and guardians, are ill-prepared to talk to adolescents about the progression of puberty. According to Yohannes (2016), high rates of maternal mortality and morbidity from complications connected to abortion, fistula, and other pregnancies are thought to be caused by a lack of access to and use of adolescent and youth-friendly reproductive health care.

### ***2.7 Critical review of presented literature***

In LMICs, puberty and school-based sexual information programs often focus narrowly on girls alone mostly tackle issues centering on menstruation. Ongoing scientific research is essential to better comprehend this influential life stage. This means that there is insufficient literature on SRH and puberty education targeting both boys and girls with the focus on a wide range of topics and not just on menstrual hygiene management.

Ignorance of or being unable to apply proper means of handling puberty among VYA has a negative impact on the physical and mental wellbeing of VYA, as well as their educational opportunities in developing countries (Ten, 2007). Improving adolescent's knowledge on puberty development through puberty books is hence of paramount importance (Dasgupta & Sarkar, 2008). The studies reviewed in this chapter do confirm the value of adequate information, and further, the fact that knowledge can influence attitudes towards good hygiene, behavioural practices, and proper menstrual hygiene significantly. Therefore, it is very important to prepare adolescent girls prior to menarche sufficiently by educating them on menstruation and menstrual hygiene. Furthermore, it is necessary to promote VYA's knowledge on puberty development through reading puberty books.

## **CHAPTER 3: METHODOLOGY**

### ***3.1 Introduction***

This section describes the overall study design, setting, population group and sampling, data collection and analysis, reliability, and generalizability as well as the ethical considerations pertaining to the study.

#### ***3.1.1 The Intervention***

The intervention was based on an evidence-based puberty book (written in English) that was developed following consultative meetings with different technical stakeholders including government ministries to assess the age-appropriate contents with the book. VYA boys and girls use the books, which provide them with knowledge and information about their evolving bodies. The puberty books are a component of the Growing Up GREAT! program toolkit, which employs a socio-ecological approach and a gender-transformative intervention package to give VYA boys and girls accurate information about sexual and reproductive health (SRH) and promote discussion about associated social norms. During monthly club meetings, a collection of materials for teenagers encourages discussion about puberty, gender equality, healthy relationships, gender-based violence, and other relevant topics. Primary school life skills teachers were trained in facilitation skills for the puberty books to its delivery in schools. There were a total of 22 educators at the beginning of the intervention of which 11 were female and 11 were male and all completed the puberty sessions.

### ***3.2 Study design***

The study was quantitative in nature and used a pre- and post-test design as the puberty book was an intervention that was to be piloted in schools. Drennan & Hyde (2008) states that “the pre-/post study design measures responses on the assumption that the respondent’s assessment and

understanding of the concept being measured could change as a result of an intervention. In theory, if the post-test score is significantly greater than the pre-test score, it indicates that change occurred in the educational variable of interest”.

For this study, quantitative research was appropriate since it allowed for the measurement of change in knowledge among the VYA on puberty issues before using the puberty books and after reading the puberty books. In addition, relationships were drawn to discover the impact of the books among VYA, since the study was quantitative in nature, data was gathered using a standardized questionnaire (Fowler, 1994). Since the questionnaire responses were graded and thus easily quantifiable, a quantitative method was selected for the investigation.

### ***3.3 Sampling, recruitment and setting for the study***

VYA from ten schools in Blantyre urban district, Malawi were recruited as study participants. These are the schools where the books were piloted hence these schools had access to the puberty books.

The VYA were recruited from sampled schools. The sampling frame was generated based on the Save the Children’s project listing information and school going adolescents; aged 10-14 were randomly selected for interviews. A multi-stage sampling approach was used for enrolling participants into the study. The primary sampling units (PSUs) was chosen at the initial stage and these were the clusters. Agresti & Finlay (2008) defines a cluster as “the smallest operational area established for the program operation with well-defined boundaries”. In the sampled clusters, listing of all secondary sampling units (schools) was done. The listing was done to sample schools for the assessment.

Using Population Proportion to Size (PPS) 10 schools were sampled to participate in the pilot from the total number of schools in the impact project area, where in each cluster a total of two (2)

schools were selected for the interventions/assessment. From the sampled ten (10) schools, a total of twenty-two (22) learners per school from standard five to seven were randomly selected from a total of 2000 learners for assessment and thus 220 VYA learners were sampled for this study.

### ***3.4 Calculating the sample size***

When calculating the size of the sample, the proportion that would allow generating a representative sample size (0.5 or 50%) especially for the VYA knowledge of puberty change indicator was used. The sample size was selected to help assess at least a 20% change on the indicators between the baseline (before reading the book) and the end line (after reading the book) assessments. The sample size was calculated using the following formula suggested by Hedeker (1999). Refer to appendix M for the full sample size formula.

$$N = \frac{[Z_{\alpha}(2\bar{p}\bar{q})^{1/2} + Z_{\beta}(p_1q_1 + p_2q_2)^{1/2}]^2(1 + (n - 1)\rho)}{n(P_1 - P_2)^2}$$

The indicator: “Percentage of adolescents who have knowledge of puberty development changes” was used. Since there were no recent estimates at hand before the study, it was assumed that at baseline, 50% of adolescents have knowledge of puberty changes, and it was also assumed that the study would increase the knowledge by 20% to 70% in the lifetime of the project. To detect an increase from 50% to 70% with 90% power, common correlation for repeated measurements of 0.6 across 2 observation time-points and a 2-tailed test of significance at the 5% level was used.

### ***3.5 Data collection procedure***

For data collection, permission was obtained from the District Education Manager and thereafter from the person in charge of the school, mostly it was the head teacher to interview VYA at the school. All subjects underwent a complete informed consent procedure (*written* parent and adolescent consent). Once consent was obtained by signing on the consent form by a parent or

caregiver and assent form by the VYA, I proceeded to conduct interviews with VYA at the school in a confidential and private space. Interviews were conducted after school hours. Before the first session of reading the puberty books, a pre-test questionnaire was given, and after six weeks of reading the puberty books, a post-test questionnaire was given. Refer to appendices A to D for the questionnaires. The interview took no more than an hour and the interviews were conducted from March 2020 for the pre-test and May 2020 for the post-test. To minimize desirability bias multiple data collection techniques were used i.e., the researcher combined self-reported data with observational data during the interviews. In addition, the questions were framed in a neutral and non-judgemental way that did not suggest “right or wrong” answers. Since data collected amidst the COVID-19 pandemic, prevention measures were adhered to and these included maintaining social distances, use of masks and hand sanitizers during the interviews. Participants could leave the interview at any time. Participants were given unique identification numbers to ensure anonymity. The researcher was the only person with access to the password-protected computer where the responses entered on the questionnaire were stored. Data collection took place over a period of approximately six weeks between March to May 2020.

### ***3.6 Analysis of data***

“Data analysis is the process of structuring and bringing order and meaning to the bulk of data collected” (Marshall & Rossman, 1995). To do this, the data must be divided into granular categories then making summaries (Mouton, 2001).

Using Microsoft Excel, data was cleaned for inconsistencies such as incomplete recording of ages, school names, gender etc. Using the cleaned dataset, I imported the excel spreadsheet into STATA software version 14 and descriptive statistics in form of frequency tables were tabulated. The study

population was described using descriptive statistics, such as the mean, standard deviation, and range.

Statistical analysis was performed using STATA version to calculate the difference in responses to pre- and post- exposure to the puberty books. For statistical significance, the study tested the observed difference in outcomes before and after reading the puberty book using McNemar's exact test for matched pairs. Using the two-tailed chi-squared test, a p value of 0.05 or lower was regarded as statistically significant. Using McNemar's 95 percent confidence intervals, the percentage difference was calculated.

### ***3.7 Validity and reliability***

Participants from the sampled schools were randomly selected to minimize selection bias. To ensure reliability, the data collection instruments (questionnaires) were pre-tested in few schools and questionnaires were administered to 20 students from the pilot schools by the researcher and corrections were made based on the pre-test findings before administering final questionnaires to the students. Data from pre-test was not used in actual study. At pre-test face validity was measured by having an expert i.e., The test is a valid measure of the notion being measured just by glancing at the items in the questionnaire, the supervisor determines after reviewing them. Reliability of measurement is important for the interpretation and generalization of research findings (Hennekens & Buring, 2007). To improve reliability of the study the data collected was verified by a statistician trained to complete data collection tools. In addition, since STATA statistical package was used for analysis, a do-file with commands for data analysis was produced so that an independent researcher can be able to re-run the analysis to ensure reliability.



### ***3.8 Ethical considerations***

The study proposal was submitted to the University of the Western Cape (UWC) Higher Degrees Committee and ethical clearance was obtained from the UWC Humanities and Social Sciences Research Ethics Committee (HSSREC). In addition, The College of Medicine Research Ethics Committee (COMREC) granted local ethical approval. With each participant, a complete written informed consent procedure was conducted (parental consents for caregivers and assents for VYA) in English and Chichewa. Participants were able to leave the study at any point because participation was voluntary. The parent or legal guardian gave their consent for the VYA. The VYA took with them home the information sheet and parental consent forms so that parents read thoroughly and gave back the signed copies to the VYA once they agreed or refused to participate in the study and the participant gave their assent. Their wishes and well-being were always honored. Therefore, if a VYA refused to participate while having parental or guardian approval, their decision was honored and accepted. Signed consent and assent forms were stored under lock and key in filing cabinets only accessible by the researcher. Confidentiality was treated with the utmost care because the subject at hand was so sensitive. Participants' autonomy and dignity were always upheld. They still maintain their anonymity, and neither the consent documents nor the interview questions were accessible to anyone not approved. If the researcher learned of any violations such as sexual, emotional or physical abuse of participants, or if they required further emotional or psychological support, the researcher referred them to the relevant services for further support and/or investigation. These referrals were made either to a psychologist residing at the nearest health facility or to the nearest Police Victim Support Unit. The use of the puberty books at the school was neither negatively impacted by participation in the study or by refusing to engage in it. Refer to appendices E to L for the information sheets, consent and assent forms.

## CHAPTER 4: RESULTS

### 4.1 Introduction

The pre- and post-exposure assessment's significant findings are summarized in this section. The findings have been presented based on the key objectives of the assessment and are segmented into summary tables of responses from girls and boys.

### 4.2 Sample description

A total of 220 learners from ten sampled schools (110 girls and 110 boys) were interviewed at baseline. At end line, 191 learners (96 boys and 95 girls) were interviewed representing a response completion rate of 87% (191/220). At end line, twenty-nine (29) learners were not interviewed as they could not be traced due to the disruption of the COVID-19 pandemic and the lockdown at the time of data collection. Table 1 below shows the number of learners interviewed at both baseline and end line, and number of learners dropped out by school and by gender.

*Table 1: Distribution of survey completion by gender and by school*

Name of school	Boys			Girls		
	Number interviewed		Number dropped out	Number interviewed		Number dropped out
	Baseline	End line		Baseline	End line	
Chimwalira	11	11	0	11	11	0
Jenala	11	10	1	11	11	0
Kasimu	11	9	2	11	8	3
Khuluvi	11	8	3	11	11	0
Mtimawoyera	11	10	1	11	11	0
Nakamba	11	11	0	11	9	2
Namatapa	11	11	0	11	11	0
Namyala	11	8	3	11	7	4
Nathupi	11	9	2	11	8	3

Ntangatanga	11	9	2	11	8	3
<b>Total</b>	<b>110</b>	<b>96</b>	<b>14</b>	<b>110</b>	<b>95</b>	<b>15</b>

Overall, 29 participants dropped out of the study of which 15 were girls and 14 were males. The reason for dropping out were mainly that some participants were no longer interested in the study, some learners had relocated to other districts and some indicated that their parents felt that the puberty education was a taboo for their children and hence withdrew them from the study.

#### 4.3 Age of learners

Overall, adolescents aged 10-14 for both boys and girls in all sampled schools were interviewed with an average age of 12 for both boys and girls. Table 2 below shows the age distribution of participants by gender.

*Table 2: Age distribution of learners by gender*

Age in complete years	Boys (n=96)	Mean age	Girls (n=95)	Mean age
10	16%	12	15%	12
11	14%		9%	
12	16%		20%	
13	28%		24%	
14	27%		32%	

#### 4.4 Who is their caregiver?

Adolescent learners were asked who their caregiver is at home. Overall, 57% and 62% of boys and girls respectively live with their biological parents (both mother and father). Table 3 below shows whom learners stay with at home by gender.

*Table 3: Distribution of learners by caregiver type*

Caregiver type	Boys (n=96)	Girls (n=95)
Both mother and father	57%	62%
Mother	22%	18%
Grandparents	15%	9%

Father	1%	5%
Brother/Sister	3%	3%
Aunt/uncle/Other relatives	2%	2%

#### ***4.5 Study findings by thematic areas for girls and boys***

This section presents the study findings by thematic areas for both girls and boys. The thematic areas of interest included: 1) physical and biological changes that occur in girls during puberty, 2) menstrual and hygiene management, 3) behavioural conduct during puberty development stages by girls and boys, 4) perception of girls towards puberty development stages, 5) self-efficacy of girls during puberty development stages, 6) young adolescents' knowledge about HIV transmission, and 7) gender issues/norms of adolescent girls and boys during puberty development stages.

##### *4.5.1. Physical and biological changes that occur in girls during puberty*

All learners were asked to identify some of the biological and physical changes that occur in girls during the puberty development stages. The question aimed at assessing girls' knowledge in terms of knowing the changes that occurs in girls as they are going through the development stages. The question was asked to learners at both baseline (before the puberty books) and at the end line (after reading the puberty books). Results demonstrate a significant gain in knowledge among girls in relation to understanding the physical and biological changes after reading the book. After reading the puberty book, girls showed a significant gain in knowledge in the following areas: Development of hair in pubic areas and armpits increased from 41% to 78%, ( $p = 0.001$ ); Breasts become sensitive increased from 68% to 88%, ( $p = 0.001$ ); Begin menstruation increased from 27% to 53%, ( $p = 0.001$ ); Development of soft voice increased from 17% to 39%, ( $p = 0.001$ ). Other knowledge parameters assessed did not show significant change after reading the book

which included: Pressure to stop schooling from 1% to 0% before and after the puberty book respectively with ( $p = 0.317$ ). The table 4 below presents results before and after reading the book of girls' knowledge on physical and biological changes that occur during puberty.

*Table 4: Change in knowledge before and after reading the book on physical and biological changes that occur during puberty among girls (n=95)*

<b>Variable</b>	<b>Before</b>	<b>After</b>	<b>Change (95% CI)</b>	<b>p-value</b>
Grow taller	20%	27%	7 (-5.50, 20.40)	0.223
Develop pubic hair	41%	78%	36 (24.8, 48.83)	< 0.001
Pimples on face	13%	10%	-2 (-10.87, 6.66)	0.593
Become moody	1%	3%	2 (-3.05, 7.26)	0.317
Breasts become sensitive	68%	88%	20 (9.91, 30.10)	< 0.001
Begin menstruation	27%	52%	25 (11.84, 38.68)	< 0.001
Attracted to boys	5%	0%	-5 (-10.8, 0.28)	0.063
Develop soft voice	17%	39%	22 (10.07, 34.14)	< 0.001
Stop schooling	1%	0%	-1 (-4.16, 2.05)	0.317

Similarly, boys were also asked to mention some of the biological and physical changes that occur to them during puberty development stages before and after reading the puberty books. Just like with the girls, the findings show that there was a significant increase in knowledge among boys on the physical and biological changes that occur during puberty. The significant changes in knowledge can be demonstrated under the following responses both before and after reading the puberty book: Development of hair in pubic and armpits increased from 53% before reading the puberty book to 77% after reading the puberty book, ( $p = 0.001$ ). Development of pimples on the face increased from 7% at baseline to 38% at end line with  $p$ -value = 0.001. Begin to experience wet dreams increased from 8% at baseline to 60% at end line with a  $p$ -value = 0.001. Deepening of the voice increased from 36% at baseline to 72% at end line with  $p$ -value = 0.001. Just like with the girls' findings, other knowledge parameters assessed did not show significant change after reading the book and these included: Growing taller as it changed from 45% at baseline to 46%

with p-value = 0.545. The table 5 below presents results for the McNemar test analysis before and after reading the book of boys' knowledge on physical and biological changes that occur during puberty.

*Table 5: Change in knowledge before and after reading the book on physical and biological changes that occur during puberty among boys (n=96)*

<b>Variable</b>	<b>Before</b>	<b>After</b>	<b>Change (95% CI)</b>	<b>p-value</b>
Grow taller	45%	46%	1 (-2.03, 4.11)	0.545
Develop hair in pubic area and armpits	53%	77%	23 (26.8, 49.03)	< 0.001
Pimples on face	7%	38%	31 (10.04, 38.04)	< 0.001
Should begin having sex	15%	15%	0 (-3.93, 3.93)	1.000
Desire for independence	25%	26%	1 (-2.03, 4.11)	0.317
Should get married	6%	6%	0 (-1.04, 1.04)	1.000
Wet dreams	8%	60%	52 (23.93, 63.92)	< 0.001
Hair on chest	8%	20%	12 (-4.50, 15.90)	0.122
Attracted to girls	56%	57%	1 (-2.03, 4.11)	0.317
Voice deepens	36%	72%	36 (25.55, 45.13)	< 0.001

#### *4.5.2. Menstrual and hygiene management*

Girls were asked questions regarding menstrual hygiene management. The questions explored if girls have ever heard of menstruation and if they have any knowledge of menstrual blood control. Additionally, girls were asked if they could still go to school during the menstruation period. The findings are presented in the Table 6 below. Overall, there was a significant increase in the number of correct answers for key questions on menstrual hygiene management by the girls after reading the book, compared to responses before reading the books. For instance, the percentage of girls who responded correctly when asked if they are able to go to school when menstruating increased from 24% to 84%, (p = 0.001) after reading the puberty books.

*Table 6: Menstrual hygiene management results by the girls before and after reading the puberty book (n=95)*

<b>Variable</b>	<b>Before</b>	<b>After</b>	<b>Change (95% CI)</b>	<b>p-value</b>
Ever heard of menstruation	55%	93%	37 (26.66, 46.13)	< 0.001
Know how to control menstrual blood	29%	68%	38 (26.97, 49.62)	< 0.001
Able to go to school during menstruation period	24%	84%	60 (47.13, 72.87)	< 0.001

#### 4.5.3. Behavioural conduct during puberty development stages by girls and boys

Six statements were read aloud to study participants regarding normal behaviours when girls and boys are going through puberty. Respondents were asked to agree or disagree with statements about normal behaviour for girls during puberty (see Table 7 below). As the findings in Table 7 suggest, most girls were generally in agreement that the behaviours in question were normal for girls to exhibit when going through puberty. The findings further showed significant increases in the proportion of girls who reported that the behaviours were normal for girls during the puberty development stages after reading the book. For instance: the behaviour of “Please others and not feel different from her friends” increased from 53% to 84% ( $p = 0.001$ ). The number of respondents who agreed that it was normal for girls to “Form groups of girls only” increased from 68% to 95%, ( $p = 0.001$ ).

*Table 7: Puberty development stages on behaviour changes experienced by girls before and after reading the puberty book (n=95)*

<b>Variable</b>	<b>Before</b>	<b>After</b>	<b>Change (95% CI)</b>	<b>p-value</b>
Please others and not feel different from friends	53%	84%	30 (18.36, 43.35)	< 0.001
Feel happy today and sad tomorrow	42%	72%	29 (16.63, 42.95)	< 0.001
Form groups of girls only	68%	95%	27 (16.64, 38.68)	< 0.001
Begin bleeding	54%	88%	34 (21.35, 46.74)	< 0.001
Bathe daily during menstruation	58%	92%	34 (22.96, 45.13)	< 0.001
Keep calendar to track menstruation days	64%	89%	24 (12.50, 36.44)	< 0.001

Unlike with the girls, the boys’ findings did not show significant increase in the proportion of boys who reported that the behaviours were normal for boys during the puberty development stages

after reading the book (See Table 8 below). This could be as a result of the cultural and gender norms which could need community engagement with community gatekeepers as agents of change. For instance: the behaviour of “Please others and not feel different from her friends” was constant from 63% before reading the puberty book to 63% ( $p = 1.000$ ). The number of respondents who agreed that it was normal for boys to “Form groups of boys only” also was constant from 66% to 66% ( $p = 1.000$ ).

*Table 8: Puberty development stages on behaviour changes experienced by boys before and after reading the puberty book (n=96)*

<b>Variable</b>	<b>Before</b>	<b>After</b>	<b>Change (95% CI)</b>	<b>p-value</b>
Please others and not feel different from friends	63%	63%	0 (-1.04, 1.04)	1.000
Feel happy one day and then suddenly feel sad or shy next day	51%	52%	1 (-2.03, 4.11)	0.317
Form groups with boys only	66%	67%	0 (-1.04, 1.04)	1.000
Want others to understand his feelings	50%	51%	1 (-2.03, 4.11)	0.317
Competitive with friends	66%	66%	0 (-3.93, 3.93)	1.000
Be successful in school and feel competitive with friends	63%	63%	0 (-1.04, 1.04)	1.000
Feel attracted towards girls	51%	52%	1 (-3.53, 5.61)	0.564

#### *4.5.4. Perception of girls towards puberty development stages*

Four statements were read aloud to the girls, and they were asked to agree or disagree with each statement regarding how they feel when going through puberty and what their perceptions are towards puberty development. Overall, the findings (as shown in Table 9) show significant increases in the proportion of girls agreeing to the statements on the end-line questionnaire relating to attitudes/perceptions of girls towards puberty. For instance, the proportion of girls who agreed that they could go to school during their periods increased from 24 % to 84 % ( $p = 0.001$ ). Table 9 below shows the results for each statement and findings in the table suggest most girls have positive attitudes/perceptions towards puberty development stages.



*Table 9: Perception of girls towards puberty development stages results before and after reading the puberty book (n=62)*

<b>Variable</b>	<b>Before</b>	<b>After</b>	<b>Change (95% CI)</b>	<b>p-value</b>
I feel I can go to school during my period (menses)	24%	84%	60 (47.13, 72.87)	< 0.001
I feel secure during my period (menses)	31%	71%	40 (27.13, 52.87)	< 0.001
I am not afraid of next period (menses)	36%	67%	30 (17.07, 43.98)	< 0.001
I am worried about my body changes	48%	70%	22 (7.63, 36.59)	0.002

#### 4.5.5 Self-efficacy of girls during puberty development stages

Three statements were read aloud to both girls and boys regarding independent decision making to seek or ask for information about puberty changes. Respondents were asked to agree or disagree with each of the statements (see Table 10 below). Overall, the findings show significant increases in the proportion of positive answers given by girls in the post-questionnaire relating to self-efficacy. For instance, the percentage of girls who believed they are able to talk to their parents about staying in school increased from 80% to 100% ( $p = 0.001$ ). Table 10 below displays the results for each question, which suggest the majority of girls feel they are able to seek correct information about puberty development changes.

*Table 10: Information sources of girls and boys during puberty development stages before and after reading the book (n=96 for boys and n=95 for girls)*

<b>Variable</b>	<b>Girls</b>				<b>Boys</b>			
	<b>Before</b>	<b>After</b>	<b>Change (95% CI)</b>	<b>p-value</b>	<b>Before</b>	<b>After</b>	<b>Change (95% CI)</b>	<b>p-value</b>
I am able to seek correct information when I have questions or concerns about growing up	67%	84%	16 (5.01, 28.68)	0.004	67%	98%	31 (13.23, 32.9)	< 0.001
I am able to talk to parents about staying in school	80%	100%	20 (10.90, 29.10)	< 0.001	68%	100%	31 (13.93, 33.21)	< 0.001

I feel confident about growing up	78%	97%	18 (9.49, 28.40)	< 0.001	78%	96%	18 (9.05, 27.40)	0.001
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Similarly, boys showed significant increases on all three parameter questions on making independent decisions to seek information about puberty changes. When asked if they are able to seek correct information when they have questions about growing up, there was an increase from 67% before reading the puberty book to 98% after reading the book ( $p = 0.001$ ). Table 11 below shows the boys results, with significant percentage increase on all questions under self-efficacy.

#### 4.5.6 Girls' knowledge about HIV transmission

Knowledge of STI's including HIV and their effects on one's health is vital in the promotion of sexual and reproductive health (SRH) among adolescents. All the adolescent respondents, regardless of whether they have had sex or not, were asked if they had heard anything about HIV. Over 90% of girls answered they had heard of HIV before and after reading the book (92% before the book and 100% after the book respectively).

When asked to state how HIV is transmitted, there were no significant differences observed before and after reading the book in the proportion of correct responses, as shown in Table 13 below. Generally, the findings suggest a knowledge gap in HIV transmission among girls, which the program needs to explore further.

*Table 11: Knowledge on HIV transmission among girls and boys before and after reading the book (n=96 for boys and n=95 for girls)*

Variable	Girls				Boys			
	Before	After	Change (95% CI)	p-value	Before	After	Change (95% CI)	p-value
Ever heard of HIV	92%	100%	7 (1.06, 13.67)	0.008	88%	98%	10 (10.01, 26.41)	0.006
Unprotected sex with someone	98%	94%	-4 (-10.03, 0.94)	0.125	77%	97%	20 (10.04, 28.46)	< 0.001

who is HIV positive									
Sharing needles with someone who is HIV positive	65%	57%	-7 (-20.10, 4.19)	0.162	1%	1%	0 (-1.04, -1.04)	1.000	
Born to someone who is HIV positive	18%	21%	3 (-7.41, 14.23)	0.491	18%	69%	51(18.23, 43.61)	< 0.001	
Holding hands with someone who is HIV positive	4%	2%	-2 (-8.84, 4.30)	0.414	34%	3%	-31 (-42.04, -20.9)	< 0.001	
Eating with someone who is HIV positive	1%	2%	1 (-3.85, 6.12)	0.564	2%	2%	0 (-1.04, -1.04)	1.000	

In contrast with the girls, boys demonstrated knowledge increase when asked how HIV is transmitted. The percentage of boys who responded that HIV is transmitted through unprotected sex increased from 77% at baseline to 97% ( $p = 0.001$ ) at end line. Likewise, the percentage of boys who responded that HIV is transmitted by being born to a mother who is HIV positive also increased from 18% before reading the puberty books to 69% after reading the puberty books ( $p = 0.001$ ). Table 14 below, summarizes the HIV responses by boys.

On the other hand, girls had a higher knowledge at baseline when asked if they had ever heard about HIV and also if having unprotected sex with someone who is HIV positive is a one way of transmitting HIV.

#### *4.5.7 Gender issues/norms of adolescent girls and boys during puberty development stages*

There is huge debate on gender norms in communities and societies in Malawi. There is belief that some duties can only be performed by either a man or woman because of cultural gender norms. For instance, it is believed that farming is the duty of a man, while cooking is a duty of a woman. During the assessment girls were asked their views on the gender norms. Specifically, they were

asked to mention the duties that girls should perform. There was one question asked with six multiple response statements pre- with options “yes or no”. Overall, the results show significant changes in perceived gender norms after exposure to the puberty book. The percentage of respondents who believe that only girls are supposed to farm decreased from 61% to 30%, ( $p = .001$ ) after reading the book. Being considered as boy’s duty only by girls. The proportion of respondents who selected that changing baby nappies is only the duty of girls decreased from 33% to 2%, ( $p = .001$ ) after reading the book.

*Table 12: Perceived gender norms of girls before and after reading the book (n=96 for boys and n=94 for girls)*

Variable	Girls				Boys			
	Before	After	Change (95% CI)	p-value	Before	After	Change (95% CI)	p-value
Farming	63%	30%	-32 (-47.19, -18.07)	< 0.001	85%	86%	1 (-2.03, 4.11)	0.317
Cutting down trees	15%	4%	-11 (-19.70, -3.46)	0.002	50%	48%	-1 (-5.61, 3.53)	0.564
Cooking	94%	92%	-2 (-9.67, 5.46)	0.527	30%	31%	1 (-3.53, 5.61)	0.564
Changing baby nappies	33%	2%	-31 (-42.42, -20.73)	< 0.001	9%	9%	0 (-1.04, 1.04)	1.000
Washing dishes	94%	96%	2 (-4.77, 8.98)	0.479	34%	34%	0 (-3.93, 3.93)	1.000
Sewing clothes	36%	2%	-34 (-45.36, -24.11)	< 0.001	30%	30%	0 (-3.93, 3.93)	1.000

On the other hand, boys did not show any significant changes after reading the puberty book on the gender roles that are perceived to be done by boys or girls only. Unlike with the girls, the percentage of respondents who believe that only boys are supposed to farm increased from 85% to 86%, ( $p = 0.317$ ) after reading the book. Similarly, the proportion of respondents who selected that changing baby nappies is only the duty of girls remained constant at 9% before and after reading the puberty book.

The findings from *table 12* above also suggest that information alone is not enough to address entrenched gender norms around what is suitable for boy's vs girls in a community.

#### ***4.6 Summary of findings***

The findings show that the adolescents' knowledge about the puberty development and other aspects was low before reading the puberty books, and this could pose a challenge on their attitudes towards attainment into adulthood. However, after reading the puberty books, there has been significant knowledge increase both among girls and boys especially under the following areas: physical and biological changes during puberty, menstrual hygiene management, attitudes towards puberty development, self-efficacy and HIV knowledge. With these improvements in knowledge on the adolescents, the necessity of utilizing the puberty books need not to be over-emphasized. The next chapter discusses these study findings and provides recommendations based on these findings.

## **CHAPTER 5: DISCUSSION**

The purpose of this study was to evaluate how the puberty books had an effect on VYA's knowledge and attitudes towards puberty development, and the physical changes that occur during puberty and their level of confidence to manage these changes in primary schools of Zomba district, Malawi. This research contributes to an important but limited body of knowledge regarding puberty and sex education programming for VYA.

The finding that puberty education interventions can lead to immediate improvements in knowledge about physical and behaviour changes has been reported in several other similar interventions e.g., a study by Salam (2016) and a study by Nagar and Aimol (2011). However, almost all of these studies focus on older adolescents. Our study highlights the fact that even VYA show improvements in knowledge following a puberty book intervention. The girls from the study when asked about the developmental changes that happen during puberty after reading the puberty books, findings showed that most girls mentioned the following body changes: development of hair in pubic places, breasts becoming more sensitive, begin menstruation, and developing of soft voice. This improvement in knowledge is important in this context because Malawi's young people lack comprehensive puberty knowledge, which has been reported in the MDHS, (2016). Although knowledge does not equate to behavior change, it is a necessary prerequisite.

Similarly, in boys, there was also an increase in the positive responses on knowledge about; development of pimples in the face, experiencing of wet dreams, deepening of voice and growing taller. These findings are similar to the study by Campbell and MacPhail (2002) whose intervention study highlighted that puberty education increases awareness of physical changes that occur during adolescence. Similarly, findings by Denno et al. (2015) supported the findings of integrating puberty education in addition to the normal life skills educations that learners receive.

Before reading the puberty books, though the VYA experienced some noticeable changes in their bodies, it was difficult for them to relate them with puberty and growing up. The challenge with this was that the VYA did not know how best to respond to the changes in their bodies and how to handle things like menstruation and wet dreams. A study by the WHO (2010) indicated that learning about puberty in the school setting can help students better understand who they are and how to deal with the changes they are going through. This can help them build their self-esteem and help them deal with the obstacles they may have with peers and teachers daily. Adolescents also develop a greater awareness of the myths and taboos that society has created associated with puberty, such as the stigmatization of menstruation or the dismissing of emotion as feminine. With the increased knowledge on body changes during puberty, it is evident that VYA will now be able to relate the changes on their body and how they can ably handle these changes by seeking the correct information from the right sources.

The increased knowledge of puberty development among VYA in the study is likely to help adolescents respond to changes that they experience in their body. According to Tegegn, Yazachew & Gelaw (2008), having good knowledge about puberty development among adolescents in Ethiopia facilitated access and use of SRH services. Similarly, a recent study by Yohannes (2016) found that adolescents with knowledge of puberty development and SRH services were more likely to use the services than those that did not have knowledge about these services.

Current study findings show that there was an increase in the knowledge of the girls on: menstruation, how to control menstruation and ability to go to school when menstruating. This means that the puberty books are a great resource on menstrual hygiene management among adolescents as the puberty books instil confidence among girls to continue with their studies when

menstruating and prepare girls physiologically on challenges encountered during menstruation and how to over-come them. A study by Mutunda (2013) substantiates the findings of the puberty education on menstrual management as he states that it is important for the girls to learn or have access to information about the process of menstruation prior to menarche through puberty education, so that they psychologically prepare themselves, develop power, self-esteem and understanding of the physiological changes of their entry into womanhood, thereby avoiding the misconceptions surrounding menstruation. Hence, thorough utilization of the puberty books will likely enable girls to not feel shy and stay out of school whilst undergoing menses.

The puberty books were able to influence the attitudes of the VYA. The perceptions of the learners to still go to school whilst menstruating increased and their attitudes towards the body changes during puberty were also positive after reading the puberty books. From existing research, it is evident that there is a lot of cultural norms that negatively impact VYA. Like in school environments where there is teasing about growing up and menstruation (UN Girls' Education Initiative, 2012), and where the environment discriminates against girls by its conditions; girls are likely to withdraw from school. Current study findings show that puberty books also help improve knowledge on gender norms and hence creating awareness on pubertal development changes experienced by adolescents and thus improving community perceptions on gender norms among adolescents. This in turn could help create a friendly environment where body changes are seen as normal for adolescents more especially girls as they undergo menstruation. In return, this could help improve school attendance amongst menstruating adolescent girls as shown from the study findings whereby are able to change girls' attitudes to school attendance as more girls responded that it is possible to attend school while menstruating. Similarly, a study by Yohannes (2016) also indicated



puberty education is a great resource in improving the attitudes of adolescents towards accessing SRH services and help them in making informed choices concerning puberty development.

Younger adolescents look to their parents as their main resource for knowledge and support, but most parents lack communication skills appropriate for young adolescents and are unprepared to deal with difficulties linked to puberty, SRH, and gender roles (IRH, 2010). The current study found that both girls and boys felt confident to talk to their parents about staying in school and on puberty development changes that they encounter after reading the puberty books. The findings contradict with a study conducted by Steve Snook et al. (2019) on communication of puberty development and decisions by the adolescents during puberty between parents and their adolescents in Zambia. They emphasize that parents are the single largest influence on their adolescents' puberty development and staying in school during puberty, and parents underestimate the impact they have on their decisions. For most parents and their children, the prospect of talking about topics related to puberty development creates anxiety and apprehension, and this may lead to avoidance of discussions.

The current study findings showed that girls improved knowledge on gender norms after being exposed to the puberty books and thus don't look down on themselves as they can do any job just like men can do and that they can also freely access SRH services just like anybody else. The results of the current study emphasize the significance of developing a favourable social environment that supports adolescent sexual and reproductive health (ARSH) services with interventions focusing on community norms around adolescent sexual and reproductive health (ASRH). Furthermore, the results suggest that girls were made aware of the gender norms related to them and not of the opposite sex and thus a limitation of the study which provides room for other interventions to teach gender norms for both boys and girls. According to Campbell &

Cornish (2010), use of community-based interventions can help adolescents have more positive experiences when using reproductive health services, according to research in the literature. Among them are community participation in adolescent health care and activities targeted at modifying unfavorable perceptions in the community. Hence from the current study ensuring that gender norms are promoted among girls and boys will help create a conducive environment for all to excel and help improve community perceptions on gender-related issues for the next generations. Findings from the study show that adolescents can freely seek correct information on gender norms, puberty development etc from parents and the community at large and thus improve the perception of gender norms among the VYA.

While boys showed significant knowledge improvement on HIV transmission, girls on the other hand, did not show significant improvement on how HIV is transmitted, and some indicated that it's possible to get HIV by eating in the same plate with an HIV positive person. This concurs with findings highlighted by Bankole et al (2007) on HIV transmission. This demonstrates that, in spite of having a very high degree of HIV awareness, adolescent girls lacked a thorough understanding of how the virus spreads. The findings could also be mediated by stigma. This suggests that they might not have access to enough knowledge to safeguard themselves against contracting HIV and other STIs.

## **CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS**

### ***6.1 Conclusions***

Both girls and boys demonstrated significant knowledge increase in all areas assessed except for the HIV component after reading the puberty book. The results show enough evidence that puberty books are a good source of information on puberty development stages among adolescent girls and boys. In addition, the puberty book has also proved to improve the attitude of the learners as girls can now confidently go to school whilst having menses as this demonstrates that menstruation is not a barrier and that its normal during puberty. Similarly, the puberty books also improved communication /openness of the adolescents with their parents and other people for both boys and girls as shown after reading the books, they all felt confident to talk to their parents about staying in school.

Based on these findings, we conclude that both girls and boys did find the puberty books helpful as they significantly improved their knowledge. The reported increase in knowledge gains over the short term among both girls and boys need to be confirmed by additional follow-up research, which will also look into whether the knowledge gain results in a change in attitudes and behaviors regarding the stages of puberty development.

### ***6.2 Recommendations***

Based on the key findings of this study, the following are key recommendations:

#### ***6.2.1 Reaching adolescents with information and education about puberty and sexual education***

Focus should be placed on empowering adolescents by giving them accurate, thorough information on puberty, which can provide them with long-term protective advantages. Adolescents can access knowledge on sexuality and puberty through their schools. A comprehensive puberty and sexual education program centered in schools that is sensitive to cultural differences is required. The

information gaps regarding puberty and other services may be addressed by this program. Furthermore, the intervention should also be promoted to hard-to-reach adolescents i.e school dropouts, lesbian, gay, bisexual, transgender and queer (LGBTQ). The program should also cover topics like parental relationships and any topics that are delicate for adolescents, like cultural and religious conventions.

### *6.2.2 Fostering supportive environments for positive puberty development*

There is a need to build relationships that support and reinforce positive health behaviors of adolescents. This includes building close relationships between adolescents and their parents that support and reinforce positive health behaviors of adolescents. Interventions can be implemented that target parents of adolescents such as parental education on SRH issues, puberty, facilitating parent-child communication and parental involvement in planning ASRH programs. This could be facilitated by the Departments of Health and Social Services. Furthermore, since most adolescents are not free to discuss puberty and SRH issues with their parents, puberty curricula offer a chance for adolescents to engage with knowledgeable peers and hence increasing knowledge on puberty development and other SRH issues. There is also need for interventions aimed at broader community members and institutions outside the family like in neighborhoods, schools, churches, mosques and workplaces. Such interventions should include conducting community sensitization campaigns and community adolescent health education programs. These interventions are needed to create positive social norms and community support for adolescents to practice safer behaviors and access SRH information and services. In addition, traditional authorities and religious authorities should be involved in the planning of these community based ASRH interventions to address issues related to social and religious norms.

### *6.2.3 Enhancing participation of adolescents in addressing their puberty and sexual needs*

Adolescents can actively contribute to the development of their pubertal selves by speaking up for their own wants and rights. Adolescents should take part in developing, organizing, and implementing puberty and ASRH initiatives in their neighborhoods. Programs to help adolescents prepare for puberty should not be created for them but rather with them.

### *6.2.4 Lobby with Ministry of education to adopt puberty books and incorporate in school curriculum*

The books need to be adopted and included into the curriculum so that they are made mandatory in elementary schools. To do this, the Ministries of Education and Health need to work together with all the pertinent partners. The Ministry of education should also disseminate puberty information to adolescents using mass media, education programs to ensure that accurate information on puberty development is given to adolescents. Furthermore, the ministries should include the puberty books as part of the broader sexual and reproductive health interventions. By doing this, it would be easier for adolescents to get access to services and information that are close at hand rather than having to wait for adolescents to arrive at medical facilities.

### *6.2.5 Enhance cross-learning about puberty development among boys and girls*

The puberty book intervention only focused on teaching boys and girls about the body changes that occur to them during puberty separately, the study further recommends teaching boys and girls about each other's changes during puberty as this will help minimize stigma and name calling on the opposite sex. Further, emotions, peer pressure, social norms should also be included in the intervention to help address these influences on behaviour.



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