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**MODERN CONTRACEPTIVE USE AMONG
FEMALE REFUGEE ADOLESCENTS IN
NORTHERN UGANDA: PREVALENCE,
EFFECT OF PEER COUNSELLING,
ADHERENCE, AND EXPERIENCES**

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MODERN CONTRACEPTIVE USE AMONG FEMALE REFUGEE ADOLESCENTS IN NORTHERN UGANDA: PREVALENCE, EFFECT OF PEER COUNSELLING, ADHERENCE, AND EXPERIENCES

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By

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To my mother

Your prayers and encouraging words always take precedence in my life

POPULAR SCIENCE SUMMARY OF THE THESIS

Adolescent girls in refugee camps suffer sexual violence, exploitation, and early or forced marriages. Many also get involved in transactional sex due to poverty. Moreover, those who are sexually active and wish to delay childbirth are faced with a high unmet need for contraception. This has left them at a risk of unwanted pregnancies. As a result, adolescent pregnancies are highest among refugees and other humanitarian settings. Pregnancies among adolescents are a challenge because of the associated complications, which include pregnancy induced hypertension, obstetric fistula, difficult labour, and systemic infections among others. These complications are the major cause of death among girls of ages 15 to 19 years globally. If we are to reduce the burden of adolescent pregnancy in this population, we need to understand the causes of the high unmet need of contraception, and evaluate interventions that could bridge this gap. Therefore, the aim of this thesis was to assess modern contraceptive use among female refugee adolescents, the prevalence, effect of peer counselling, adherence, and the experiences of contraceptive use.

From the first study, we found that less than 10% of the participants were using a modern contraceptive, yet they were sexually active and wanted to delay childbirth. Least likely to use modern contraceptives were participants who were married or cohabiting, and those who had older partners. The commonest reasons for not using contraceptives were fear of side effects and prohibition from the partner. This is evidence of existing gender-power imbalances which hinder use of contraception, leaving the girls at a high risk of adolescent pregnancy and associated complications.

The second study highlighted that the use of peers to offer contraceptive counselling to adolescents had a greater impact on acceptance of modern contraceptives, compared to routine counselling that is provided by nurses from health centres. In addition, participants with educated partners were more likely to accept a method compared to those who had less educated partners. This further illuminates the role of partners in contraceptive use of female refugee adolescents.

Findings from the third study showed that consistent and continued use of contraceptives was very low among female refugee adolescents. Less than 50% of the participants adhered to their contraceptives by the end of the six months of follow up. Participants who were using long acting reversible contraceptives (LARCs) like intrauterine devices and implants were more

likely to adhere to contraceptives than those who were using short acting reversible contraceptives like the oral contraceptives (pills), condoms and the injectable contraceptives.

Lastly, the fourth study highlighted the contraceptive experiences of female refugee adolescents. The respondents gave accounts of experiencing either support and encouragement, or prohibition and discouragement from their close relations towards their decision to use contraceptives. The close relations that influenced contraceptive use and decision making were peers, partners and parents/guardians, although more precedence was given to the partner. Support and encouragement were a result of the benefits of contraception in delaying child birth and child spacing, while prohibition and discouragement were based on the misconceptions of use, and the prohibitive cultural and social norms that are against adolescents getting involved in pre-marital sexual activity. In spite of the prohibition and discouragement, some adolescents went ahead and used contraceptives clandestinely. This study also revealed that schools and health care institutions played a role in adolescent contraceptive use by providing contraceptive information, dispelling misconceptions and offering motivation for continued use.

From the above findings, the significance of partners in adolescent contraceptive use is emphasized, and it illuminates the presence of gender-power imbalances in adolescent contraceptive use and decision making. We recommend that partners of adolescents are involved in future studies aimed at increasing contraceptive use among refugee adolescents. We also recommend that peer counselling should be further studied for its cost effectiveness in the refugee population. LARCs should be made more available to adolescents because they are easier to use and to adhere to.

ABSTRACT

Background: Adolescent pregnancies have remained high globally, with the highest rates occurring in low- and middle-income countries and humanitarian settings. The high adolescent pregnancy rates have been attributed to low and inconsistent use of modern contraceptives, resulting from limited knowledge on contraception, fear of side effects, and social norms among others. The complications associated with adolescent pregnancy and childbirth are the leading cause of death among adolescents globally. There is limited knowledge on the causes of low and inconsistent use of contraception among female refugee adolescents. This study aimed to assess the use of modern contraceptives among female refugee adolescents in northern Uganda, prevalence, effect of peer counselling, adherence, and experiences.

Methods: This was a mixed-methods study employing both quantitative and qualitative techniques, carried out in Palabek refugee settlement, northern Uganda. Study I, whose objective was to determine the prevalence and factors associated with modern contraceptive use, was a cross-sectional study conducted from May to July 2019. It involved 839 female refugee adolescents aged 15 to 19 years. Study II, to determine the effect of peer counselling on acceptance of modern contraceptives among female refugee adolescents, was a randomized, controlled, single-blind, superiority trial with two-parallel groups in a 1:1 allocation ratio. It was carried out from May to July 2019 and involved 588 female refugee adolescents aged 15 to 19 years. Study III had an objective to determine the rates and predictors of adherence to modern contraceptives among female refugee adolescents in northern Uganda. This was a prospective single cohort study, nested into the randomized controlled trial. It involved 272 female adolescents aged 15 to 19 years who were new starters of modern contraceptives. They were followed up for a period of six months from May 2019 to January 2020, with follow-ups done at one, three and six months. Study IV was conducted to explore the contraceptive experiences of female refugee adolescents in northern Uganda. It was an explorative qualitative study carried out from June to October 2021, among 24 purposively selected adolescents aged 16 to 19 years who were current or previous users of modern contraceptives.

Results: The prevalence of modern contraceptive use was 8.7% (95% CI: 7.0 to 10.8), with the most commonly used method being the injectable [42.5% (95% CI: 31.5 to 54.3)]. The commonest reasons for non-use of contraception were fear of side effects (39.3%), prohibition from the partner (16.4%), and the wish to become pregnant (7.0%). The factors associated with non-use were being married (OR=0.11, 95% CI: 0.04 to 0.35, $p < 0.001$), or cohabiting (OR = 0.43, 95% CI: 0.20 to 0.93, $p = 0.032$) and having an older partner (OR = 0.93, 95% CI: 0.86 to 0.99, $p = 0.046$) (*Paper I*). Peer counselling had a positive effect on acceptance of

modern contraceptives among adolescents; peer counselled adolescents were 24% more likely to accept a contraceptive method than those who received routine counselling (PR: 1.24, 95% CI: 1.03 to 1.50, $p = 0.023$). The only factor identified to be associated with acceptance was partner's education (PR: 1.45, 95% CI: 1.02 to 2.06, $p = 0.037$ for tertiary versus lower education). The most reported reasons for non-acceptance were fear of side effects and partner prohibition (*Paper II*). Adherence to contraception was low and reduced over time. Only 44% of the participants were still using a contraceptive method by the end of the six months follow up. Side effects (57.1%) and partner prohibition (23.8%) were the most reported reasons for discontinuation. Users of LARCs were more likely to adhere to contraception than the users of SARCs (OR: 3.37, 95% CI: 1.914-5.937, $p < 0.001$) (*Paper III*). Regarding the experiences of contraceptive use, the respondents' experiences revealed that their close relations significantly influenced contraceptive use and decision making. The close relations, which included peers, partners, and parents/guardians influenced use by either supporting, discouraging or prohibiting contraceptive use, guided by the established social norms. Those who encouraged use did so because of their awareness of the benefits of contraception, while those who discouraged use did so because of their opinions or misconceptions and cultural norms regarding contraception among adolescents. Schools and health care institutions also played a role in shaping attitudes and fostering motivation for contraceptive use (*Paper IV*).

Conclusion: The use of modern contraceptives among female refugee adolescents was very low, leaving the participants vulnerable to adolescent pregnancy and associated complications. Participants who were least likely to use contraceptives are those who were married or cohabiting and those who had older partners. This is indicative of gender-power imbalances in fertility decision making among adolescents. Peer counselling proved effective in increasing same-day acceptance of modern contraceptives among the participants. It should therefore be included in future interventions to prevent adolescent pregnancy. Adherence to contraception was low, especially among participants who were using short-acting reversible contraceptives (SARCs). This rendered them more vulnerable to unintended pregnancy. The fear of side effects and partner prohibition stood out as the factors that continue to impede contraceptive use among refugee adolescents. Future interventions should focus on how to address these challenges. The interpersonal relationships of the respondents (peers, partners and parents) and institutions like schools and health care greatly influence the use of contraception among the respondents. We recommend that they are involved in future interventions to reduce adolescent pregnancy.

LIST OF SCIENTIFIC PAPERS

- I. **Bakesiima R**, Cleeve A, Larsson EC, Tumwine JK, Ndeezi G, Gemzell-Danielsson K, Nabirye RC, Beyeza-Kashesya J. Modern contraceptive use among female refugee adolescents in northern Uganda: prevalence and associated factors. *Reprod Health* **17**, 67 (2020).
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- II. **Bakesiima R**, Beyeza-Kashesya J, Tumwine JK, Chalo RN, Gemzell-Danielsson K, Cleeve A, Larsson EC. Effect of peer counselling on acceptance of modern contraceptives among female refugee adolescents in northern Uganda: A randomised controlled trial. *PLoS One*. 2021 Sep 2;16(9):e0256479. doi: 10.1371/journal.pone.0256479. PMID: 34473750; PMCID: PMC8412258 <https://doi.org/10.1371/journal.pone.0256479>
- III. **Bakesiima R**, Gemzell-Danielsson K, Beyeza-Kashesya J, Ayebare E, Cleeve, A, Larsson EC, Nabirye RC. Adherence to modern contraceptives among female refugee adolescents in northern Uganda: a prospective single cohort study (*Submitted to BMC Conflict and Health*).
- IV. **Bakesiima R**, Larsson EC, Gemzell-Danielsson K, Nabirye RC, Beyeza-Kashesya J, Cleeve A. 'They stopped laughing when they realised the importance of contraception': a qualitative study to explore contraceptive experiences of female refugee adolescents in northern Uganda (*Manuscript*).

CONTENTS

1	INTRODUCTION.....	5
1.1	The burden of adolescent pregnancy	5
1.2	Drivers of adolescent pregnancies	5
1.3	The consequences of adolescent pregnancies.....	6
1.4	Solutions to adolescent pregnancies	6
1.5	What Uganda has done.....	7
2	LITERATURE REVIEW	8
2.1	Modern contraceptives	8
2.1.1	Short acting reversible contraceptives (SARCs).....	8
2.1.2	Long acting reversible contraceptives (LARCs).....	9
2.2	Modern contraceptive use among refugee adolescents	10
2.2.1	Factors associated with modern contraceptive use	10
2.3	Contraceptive counselling for adolescents	11
2.3.1	Effect of peer counselling on contraception.....	12
2.4	Adherence to modern contraceptives.....	13
2.4.1	Factors associated with adherence to modern contraceptives	13
2.5	Experiences of contraception	14
3	CONCEPTUAL AND THEORETICAL FRAMEWORK	17
3.1.1	Conceptual framework.....	17
3.1.2	Theoretical framework.....	19
4	RATIONALE.....	20
5	RESEARCH AIMS	21
5.1	General Objective.....	21
5.2	Specific objectives.....	21
6	MATERIALS AND METHODS	23
6.1	Thesis setting	23
6.2	Study design	24
6.3	Study population.....	26
6.4	Sampling procedure.....	26
6.5	Data collection.....	26
6.6	Data analysis.....	28
6.7	Data management.....	29
6.8	Ethical considerations.....	29
7	RESULTS.....	31
7.1	Summary of findings.....	31
7.2	Prevalence and factors associated with modern contraceptive use (Paper I)	32
7.3	Effect of peer counselling on acceptance of modern contraceptives (Paper II).....	34
7.4	Adherence to modern contraceptives (Paper III).....	35
7.5	Contraceptive experiences of adolescents (Paper IV).....	37

7.5.1	Theme: Contraceptive influence as reflections and reinforcement of established social norms	38
7.5.2	Sub-theme I: Role of interpersonal relationships in contraceptive use: support, discouragement and prohibition.....	39
7.5.3	Sub-theme II: Role of institutions in contraceptive use: shaping attitudes and fostering motivation	40
8	DISCUSSION	41
8.1	Gender-power imbalance; a hindrance to modern contraceptive use among adolescents.....	41
8.2	Peer counselling increases acceptance of modern contraceptives	42
8.3	Better adherence with LARC methods than with SARC methods	42
8.4	Interpersonal relationships influence contraceptive use and decision making of respondents	43
8.5	Institutions shaping attitudes and fostering motivation for contraceptive use	44
8.6	Methodological considerations	44
9	CONCLUSIONS	47
10	POINTS OF PERSPECTIVE	49
10.1	For policy and practice	49
10.2	For research	50
11	ACKNOWLEDGEMENTS.....	51
12	REFERENCES.....	53

LIST OF ABBREVIATIONS

ARH	Adolescent Reproductive Health
CI	Confidence Interval
CIC	Combined Injectable Contraceptive
COC	Combined Oral Contraceptive
DMPA	Depot-medroxyprogesterone acetate
GEE	Generalised Estimating Equations
HBM	Health Belief Model
ITT	Intention to treat
IUD	Intra-uterine device
LARC	Long-acting reversible contraceptive
MoH	Ministry of Health
PI	Pearl Index
POP	Progestin-only pill
PP	Per protocol
RCT	Randomized Controlled Trial
SARC	Short-acting reversible contraceptive
SOPs	Standard Operating Procedures
SRH	Sexual and Reproductive Health
SRHR	Sexual and Reproductive Health and Rights
STDs	Sexually Transmitted Diseases
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UDHS	Uganda Demographic Health Survey
UN DESA	United Nations Department of Economic and Social Affairs
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations International Children's Emergency Fund
VHT	Village Health Team
WHO	World Health Organization
WRC	Women's Refugee Commission

1 INTRODUCTION

1.1 THE BURDEN OF ADOLESCENT PREGNANCY

Globally, adolescent pregnancies have remained a challenge with an estimated 15% of all young women giving birth before the age of 18 years annually (1). Although there has been a reduction in the estimated global adolescent fertility rate of 11.6% over the past 20 years, the actual number of adolescent childbirths has not declined. This is due to the fast-growing population of young women aged 15-19 years globally (2, 3). In low and middle income countries, an estimated 21 million girls aged 15-19 years become pregnant annually, 12 million of whom give birth (3, 4). This accounts for 95% of all adolescent births among girls aged 15-19 years worldwide (5). Moreover, at least 10 million of all these pregnancies are unintended (3). In Uganda predominantly, there has been a slight increase in adolescent pregnancies from 24% in 2011 to 25% in 2016 (6). Higher rates are recorded in the rural and humanitarian settings of Uganda (6).

1.2 DRIVERS OF ADOLESCENT PREGNANCIES

The high rates of adolescent pregnancy are attributed to poverty, early or forced marriages, and sexual violence (3). For example, an estimated 39% of girls in the least developed countries marry before they are 18 years and about 12% before they make 15 years (7, 8). Furthermore, there is continued low use of modern contraceptives among sexually active adolescents in low-income countries (9). The low use of contraception is attributed to lack of adequate information on contraception, misconceptions, fear of side effects, limited access to contraception, lack of support from partner, family, and community, and prohibitive social norms (10-14). The same factors could lead to contraceptive non-adherence and discontinuation amongst the adolescents who use the contraceptives. Other factors that contribute to non-adherence and discontinuation are poor contraceptive experiences like side effects and stigma, commodity stock-outs, poor service quality, and limited contraceptive counselling (15). Adherence rates among non-refugee adolescents are below 25% (16), with high discontinuation rates of approximately 50% in low resource settings (17). Contraceptive experiences are also reported to influence the use of contraception among adolescents. Some of the documented experiences include stigma due to cultural and social norms (18-20), side effects (18-20), inaccurate contraceptive information due to misconceptions (21-23) and partner prohibition (21-23).

1.3 THE CONSEQUENCES OF ADOLESCENT PREGNANCIES

Pregnancies among adolescents are a challenge because of the associated complications. The complications, which include obstetric fistula, eclampsia, postpartum hemorrhage, puerperal endometritis, premature rupture of membranes and systemic infections, are higher among adolescent mothers aged 10 to 19 years than women aged 20 to 24 years (24-28). These complications are the largest contributor to death among adolescents of 15 to 19 years globally. Furthermore, the babies born to adolescent mothers are at a greater risk of adverse neonatal outcomes like preterm birth, low birth weight, poor fetal growth, developmental and psychosocial delays, and stillbirth (28-31). However, not all pregnancies among adolescents are kept to full term. Some end in abortion. An estimated 5.9 million abortions occur annually among adolescents aged 15 to 19 years, 70% of which are unsafe, leaving the girls vulnerable to morbidity and mortality (4, 26).

The social and economic consequences of adolescent pregnancy may include dropping out of school, stigma, violence from partner, and rejection from family and friends (3, 32). Dropping out of school may have further implications on future employment, which may lead to poverty (33). Adolescent pregnancy also exposes young girls to mental health problems like depression and anxiety (34).

1.4 SOLUTIONS TO ADOLESCENT PREGNANCIES

To successfully reduce adolescent pregnancies, adolescents ought to be availed with contraceptive information, methods and services (17). World Health Organisation (WHO) has been promoting contraceptive counselling as the core intervention to prevent adolescent pregnancy, because it increases contraceptive knowledge, dispels misconceptions and addresses the fear of side effects (35-37). Furthermore, contraceptive counselling improves user satisfaction with the contraceptive method, which further increases acceptability and continuation (38, 39). Several studies have evaluated numerous ways of offering contraceptive counselling to adolescents. For example through the use of trained counsellors (40), use of age-appropriate counselling (41), school-based counselling (42, 43) and peer counselling (44-46). However, existing information proves that peer counselling would be of greater effectiveness amongst adolescents, because adolescents tend to assign greater priority to their peers and easily adopt their behaviors (47, 48).

1.5 WHAT UGANDA HAS DONE

With an aim of reducing adolescent pregnancy, the Ugandan government designed and implemented the National Adolescent Health Policy (49) and the Uganda Adolescent Health Policy and Service Standards (50), which state that adolescents should be provided with adequate information about Adolescent Reproductive Health (ARH) services, so as to promote effective use of these services, including contraception. Inasmuch as contraception was introduced among adolescents, there has been a low uptake of the services. This has left many girls vulnerable to adolescent pregnancy and associated complications.

Further strategies to improve uptake of contraceptives among adolescents, including refugees, were designed and implemented by organisations like UNFPA and UNHCR. The strategies included training of health workers in contraceptive counselling for adolescents, increasing availability of contraceptive services in health centres, and offering contraception in schools (51). In spite of this, contraceptive uptake has remained low. Therefore, understanding the drivers of low uptake of contraceptives is crucial if we are to develop strategies to increase uptake and sustain use of contraceptives among refugee adolescents in northern Uganda.

2 LITERATURE REVIEW

2.1 MODERN CONTRACEPTIVES

Modern contraceptives are technological advances designed to overcome the biology of conception (52). They include the pill (oral contraceptive), injectable contraceptives, implant, contraceptive patch, vaginal ring, intrauterine device (IUD), and female and male condoms, vaginal barrier methods (e.g. cervical cap, diaphragm and spermicidal agents), female and male sterilization, and emergency contraception (53). Amongst these, the most available and commonly used methods in the refugee settings in Uganda are the oral contraceptives, injectables, the male condoms, implants, and the copper IUDs (23, 54, 55). The efficacy of contraceptive methods is measured as a Pearl Index (PI); the percentage of women who experience an unplanned pregnancy during one year of using the method. The PI is usually reported for perfect use (as seen in clinical trials) and for typical use (as seen when used in real life). The PIs for some of the commonly used methods are shown in table 1.

Table 1: Pearl Index of different contraceptive methods as typically or perfectly used

Contraceptive method	Typical use (%)	Perfect use (%)
Implant	0.05	0.05
Copper IUD	0.8	0.6
Depo-Provera Injectable	6	0.2
Combined pill and progestin only pill	9	0.3
Male condom	18	2

Modified from Trussel, 2014 (56)

2.1.1 Short acting reversible contraceptives (SARCs)

SARCs are contraceptive methods that are user dependent and need to be taken daily, weekly, or 1 to 3 monthly. They include oral contraceptives, condoms and injectable contraceptives.

Oral contraceptives (pill): The pills are available in two forms: the progestin-only pill (POP), and the combined oral contraceptive (COC) pill containing both estrogen and progestogen hormones, which can be used in cyclic or extended long cycle regimens (36, 57). The mechanism of action of mid-dosed POPs and COC is mainly through preventing ovulation with additional effects on cervical mucus. The low dose POPs act mainly on the cervical mucus to prevent sperm transport and function. COCs and mid dosed POPs are among the most effective contraceptive with high effectiveness of over 99% if correctly and consistently used (36).

Male and female condoms: These are barrier methods of contraception that prevent fertilisation (36). If used correctly and consistently, the male condom offers 98% effectiveness while the female condom offers 90% effectiveness in preventing pregnancy (36, 58). However, the typical PI is much higher.

Injectable contraceptives: There are two main types of injectable contraceptives used worldwide. These are: the combined injectable contraceptive (CIC) containing both estrogen and progestin given as a one-monthly injection, and the progestin only injectable (POI) given as a two- or three-monthly injection. The mechanism of action is prevention of ovulation (59). The injectable is a highly effective contraceptive method with an effectiveness of 99.7% with correct and consistent use and up to 95% as commonly used (36, 60).

2.1.2 Long acting reversible contraceptives (LARCs)

LARCs are methods of contraception which are highly effective in preventing pregnancy for an extended period of over a year (61). They are reversible which means that fertility resumes as soon as they are removed. They include subdermal contraceptive implants and IUDs. These are the most effective methods because they do not depend on one remembering to take or use them, which means that perfect and typical use PI is almost the same (62, 63). They are recommended for adolescents by the American Academy of Pediatrics (AAP) and the American College of Obstetricians and Gynecologists because of their effectiveness (64, 65), and because adolescents may be interested in concealing their sexual activity and contraceptive use (62).

Implants: These are small, flexible rods or capsules, the size of a match stick that are placed under the skin of the upper arm. They contain progestins, either etonogestrel or levonorgestrel (66). They are effective for three or five years depending on the type of implant. The mechanism of action is by prevention of ovulation and thickening of the cervical mucus (60). The implants are the most effective contraceptive methods available with over 99% efficacy in preventing pregnancy (36).

Intra-uterine devices (IUDs): These are available in two types: the copper containing IUD and the levonorgestrel releasing IUD. The IUDs are usually T-shaped plastic devices containing copper on the stem (and arm), or a capsule on the stem releasing levonorgestrel inserted intrauterine (36). Both the copper and levonorgestrel IUDs are over 99% effective in preventing pregnancy (66). The mechanism of action is in preventing fertilization either through the effect of copper on the gametes or levonorgestrel on the cervical mucus. The levonorgestrel IUD has a strong impact on the endometrium resulting in reduced bleeding.

2.2 MODERN CONTRACEPTIVE USE AMONG REFUGEE ADOLESCENTS

Studies have shown that the use of modern contraceptives among female refugee adolescents is very low. A cross sectional study by Ganle and colleagues in 2019 among refugee adolescents in Ghana revealed that only 12% of the participants had ever used modern contraception (55). A multi-country baseline study conducted by the United Nations High Commission for Refugees (UNHCR) together with the Women's Refugee Commission (WRC) in 2011, with an aim of refocusing family planning in refugee settings, found the modern contraceptive prevalence rates in selected refugee camps low i.e. 14.6% in Nakivale, Uganda; 6.8% in Eastleigh, Kenya; 5.1% in Ali Addeh, Somalia; 21.4% in Amman, Jordan; 36.9% in Cox Bazaar, Bangladesh and 34.2% in Kuala Lumpur, Malaysia (23, 54). In a study by Tanabe and his colleagues in 2017, a review of the UNHCR multi-country study, it was found that participants aged 15 to 19 years from all the different refugee settings had a contraceptive prevalence rate of 4% for current use and 10.1% for previous use (23).

2.2.1 Factors associated with modern contraceptive use

Several factors are reported to influence use of modern contraceptives among female refugee adolescents. These include social demographics such as age, marital status, education, occupation, parity; social cultural factors like partner's support; and service delivery factors like distance to nearest health facility.

Age: According to a cross sectional study by Nyarko in 2015, age was found to be associated with use of contraceptives among adolescents. This study, carried out to determine the prevalence and correlates of contraceptive use among 1037 female adolescents aged 15 to 19 years in Ghana, found that older adolescents (between 18 and 19 years) were 3.5 times more likely to use contraceptives than the younger ones ($p < 0.001$) (67). Another study carried out among adolescent girls in Zambia observed that older adolescents were 4 times more likely to use contraceptives than the younger ones ($p = 0.012$) (68).

Marital status: A number of studies have reported a statistically significant association between marital status and use of contraception among adolescents. For example; a study among adolescents in selected low and middle income countries found that married adolescents were less likely to use contraception than their unmarried counterparts (69). Another study by Casey and colleagues carried out in 2020 in the Democratic Republic of Congo (DRC) found that adolescents who were married were 56% less likely to use contraceptives than those who were unmarried ($p < 0.001$) (11). However, the study by Nyarko in 2015 reported otherwise, that

married adolescents or those living with their partners were 4.8 times more likely to use contraceptives than their counterparts who were not married ($p < 0.001$) (67).

Education: The highest level of education attained has been reported to be significantly associated with use of contraceptives among adolescents. A study by Nyarko found that “adolescents who had acquired up to primary or secondary education were 7.4 and 11.5 times respectively more likely to use contraceptives than those who had no education ($p = 0.003$ and $p < 0.001$ respectively) (67). Another cross sectional study carried out by Ganle in 2016 to determine the prevalence of modern contraceptive use among young women in Budumburam refugee camp in Ghana found that participants who had attained up to secondary education were more likely to use contraceptives than those who had less education ($p = 0.001$) (55).

Parity: A study by Lule and colleagues reported a statistically significant association between adolescent refugee contraceptive use and parity ($p = 0.005$). That is, participants who had a birth order of two and below were 23% more likely to use contraceptives than those who had a higher birth order (70).

Partner's level of education: A case control study by Lule and colleagues carried out in Kyangwali refugee settlement in Uganda to establish the determinants of contraceptive utilisation among teenage mothers in 2015 found that there was a statistically significant association between contraceptive use and partner's level of education ($p < 0.000$) (70). Teenage mothers whose partners had attained education over primary were twice as likely to use contraceptives as their counterparts who had less education.

Partner's support: Studies have shown that contraceptive use was significantly associated with partner's support in activities like escorting her to the health facility ($p = 0.039$, 95% CI). Participants who had support from their partners were almost twice as likely to use contraceptives compared to those who had no support from partners (70).

2.3 CONTRACEPTIVE COUNSELLING FOR ADOLESCENTS

Contraceptive counselling is the process by which a person who is seeking contraception is given information about the available methods, and guided through the selection and use of a desired method by a contraceptive provider (71). Contraceptive counselling should include information on the pros and cons of each available method, how the method works, correct and consistent use of the method, and the side effects of each method to enable informed selection of a desired method (72). It should be based on assessment of the client's needs, their preferences, and lifestyle with an aim of supporting decision making (73). With regards to

adolescents, contraceptive counselling should be provided in such a way that adolescents feel safe and assured of their confidentiality, while respecting their autonomy in decision making (72, 74, 75).

Several contraceptive counselling strategies have been studied to improve contraceptive use among adolescents. These include; training of health workers, use of adolescent-friendly spaces in health centres, use of outreach services, use of brochures, videos, mobile phones and social media, individual face to face counselling, and the use of peer educators (76-78). The use of peer educators, sometimes described as peer counselling, has shown effectiveness in improving contraceptive use in non-refugee studies.

2.3.1 Effect of peer counselling on contraception

Peer counselling is an interactive relationship between persons of the same age group to influence positive change (79). During peer counselling, trained peers provide knowledge, emotional, social and practical help to fellow peers.

There is contradicting information regarding the effect of peer counselling on contraceptive acceptance among adolescents; some studies reported a positive effect, while some reported no significant effect. For example; a cluster randomized trial among schools in England to assess the effectiveness of school based peer-led sex education in reducing unintended teenage pregnancy. This study found that girls who received peer-led sex education reported 38% less pregnancies than their colleagues who received the control, teacher-led sex education (80). The other study which reported a positive effect was a before and after intervention study carried out in Turkey to determine the effect of a continuing education program that included peer counselling on knowledge of sexual and reproductive health indicators. This study found that there was an 11.9% increase in contraceptive knowledge after the intervention ($p < 0.001$) (45).

However, a Randomized Controlled Trial (RCT) by Wilson and colleagues in 2016 evaluated the impact of peer counselling on same day desire for LARCs among 110 female adolescents attending a family planning clinic in Pennsylvania. They found that peer counselling did not have an effect on same day desire for LARC, although the participants who received peer counselling were more likely to report increased knowledge on contraceptives and positive change in attitude towards LARC (44).

2.4 ADHERENCE TO MODERN CONTRACEPTIVES

Adherence is the extent to which a person's behaviour coincides with medical or health advice, and in relation to contraception, it refers to the use of a contraceptive method in an ongoing and consistent manner as prescribed by a health worker so as to prevent pregnancy (81). Therefore, for adherence to be achieved, both continuation and correct use of the contraceptives are required. Adherence can also be termed as compliance or consistency.

Adherence to modern contraceptives among refugee adolescents has not been documented. However, studies have reported adherence to contraception among non-refugee adolescents. For example; in a retrospective study conducted by Lara-Torre and Schroeder in 2002 to determine adolescent compliance with Quick Start oral contraceptive pills among 193 young females aged 22 years and below, it was found that 65% of the participants were compliant at 3 months, and only 35% compliant at 12 months (82).

Another prospective cohort study by Diserens and colleagues carried out in 2017 to determine the contraceptive continuation rates among adolescents in Switzerland reported a contraceptive continuation rate of 51.9% among adolescents who had chosen the COC (83).

In addition, a cross sectional study conducted in 2013, to assess the use of contraceptives in a rural area in Ghana, reported that only 22.9% of the participants consistently used their contraceptives (16).

2.4.1 Factors associated with adherence to modern contraceptives

Several factors have been reported to influence adherence to contraceptives among adolescents. These include: age, education, parity, type of modern contraceptive used.

Age: According to a retrospective study by Clare and Fraser in 2013 to determine contraceptive adherence among East Harlem adolescents, it was found that younger adolescents were at greater risk of poor adherence with contraception compared to the older adolescents ($p=0.008$) (84). Another prospective study by Raine and colleagues conducted in 2011 to determine contraceptive continuation among adolescent girls in California observed that younger adolescents were more likely to discontinue from contraceptive use than older adolescents ($p=0.008$) (85).

Education: The highest level of education attained is mentioned to be associated with adherence to contraceptives among adolescents. This is as indicated in a cross-sectional study by Muhindo and colleagues to determine the predictors of contraceptive adherence among

women seeking family planning at Reproductive Health Uganda, Mityana. They found that participants who had primary or no education were 2.5 times less likely to adhere to contraceptives than their counterparts who had secondary education ($p < 0.001$) (86).

Parity: According to a retrospective study by Lara-Torre and Schroeder to determine adolescent compliance and side effects with Quick Start oral contraceptive pill, it was reported that participants who were nulliparous and nulligravid were more likely to comply or adhere to oral contraceptives. ($p = 0.038$ and 0.008 respectively) (82).

Type of modern contraceptive used: The type of contraceptive used has been mentioned to be one of the factors associated with adolescent contraceptive adherence among adolescents. In a study by Diserens and colleagues, it was reported that adolescents who were using LARCs were more likely to adhere to the contraceptives than those using SARCs ($p = 0.011$) (83).

Another study by Raine and colleagues also found that adolescents who were using LARCs were less likely to discontinue than those who were using SARC methods ($p < 0.001$) (85). In addition, a systematic review conducted by Usinger and colleagues in 2016 to determine the intrauterine contraception continuation among adolescents and young women reported that, 12 month continuation was significantly higher among IUD users compared to participants that had used other contraceptives ($p < 0.001$) (87).

2.5 EXPERIENCES OF CONTRACEPTION

According to previous research, most of the contraceptive experiences shared by adolescents were based on affordability and availability, side effects, influence from peers, partners and parents, stigma, and motivation to keep using in spite of challenges. These are further expanded on below.

Availability and accessibility: A systematic review conducted in 2018 by Ivanova and colleagues to explore the sexual and reproductive health experiences of refugee, migrant and displaced girls in Africa, reported that the respondents experienced challenges with access to sexual and reproductive health (SRH) services like contraception because of the long distances to the health clinics and the cost of the services (88). In a multi-country study by Tanabe and colleagues on family planning among refugees in 2017, most of the adolescent participants reported challenges relating to accessibility. They stated that unmarried adolescents were not allowed to get contraceptives at the clinics (23). Another study by Okanlawon and colleagues in Nigeria to explore the knowledge, perceptions and attitudes of contraceptive use among

refugee youths in 2010, reported that the respondents experienced challenges with accessing contraceptive services that were only available outside the refugee camp (22).

Influence from peers, partners and parents: A study by Harrington and colleagues to understand the social influences on contraception among adolescents in Kenya in 2021 found that some respondents were discouraged by their partners from using contraceptives. One of the respondents recounted how she was pressurized by the partner to stop using contraceptives because of his worries regarding the side effects (89). In another study by Ontiri and colleagues in Kenya, to explore contraceptive use and discontinuation among women in 2021, one of the adolescents explained that the husband threatened to beat her up if she continued using contraceptives (18).

Some partners were reported to be of support to the adolescents who were using contraceptives. For example, in a study by Kibira and colleagues carried out to explore experiences of women using contraceptives in Uganda, some of the adolescents mentioned that their husbands were supportive of their contraceptive use, to the point that they would even remind them when to go back for refills (19). In the same study by Kibira and colleagues, it was reported that close peers were supportive if they had positive experiences with contraception, while others were prohibitive if they had had negative experiences with contraceptive use (19).

Side effects: A study carried out by Bangoura and colleagues in Conakry to explore the experiences, preferences, and needs of adolescents for contraceptive use in 2019, reported that one of the negative experiences shared by the respondents was the side effects. The respondents experienced side effects like weight gain and menstrual problems (90). In another study by Ontiri and colleagues to explore contraceptive use and discontinuation among women in Kenya in 2021, some of the adolescents experienced side effects like bleeding problems, loss of appetite, and a lower sexual drive with the contraceptives they were using (18)

Stigma from friends and society: In a study by Bangoura and colleagues in Conakry, respondents gave accounts of being stigmatized by community members when they found out that these girls were using contraceptives. The respondents mentioned that they were stigmatized because of the cultural and social norms which prohibit contraception among young girls (90). Another study by Harrington in 2021 to understand the social influences on contraceptive decision making among adolescents in Kenya, reported that the respondents stated that they were being referred to as “spoiled girls” if found using contraception and that this left a bad reputation to the families of the girls (89).

Motivation to use contraception: From previous studies, some respondents were motivated to keep using contraception in spite of the challenges they faced. For example; in the study by Harrington and colleagues, one of the participants mentioned that her desire for a bright future is what motivated her to keep using contraception despite the challenges she faced (89). Another motivation to use contraception mentioned by adolescents was the fear of the economic burden that comes with having many children, as reported in a study by Ontiri and colleagues in 2021 to explore contraceptive use and discontinuation among women in Kenya. Some respondents mentioned that the contraceptives enabled them to prevent unwanted pregnancies and plan for a better future, and this was their motivation to keep using amidst the challenges they faced (18).

3 CONCEPTUAL AND THEORETICAL FRAMEWORK

3.1.1 Conceptual framework

The conceptual framework describes the determinants of modern contraceptive use among refugee adolescents. The distal determinants which indirectly influence contraceptive use include individual/personal factors, interpersonal factors, community and health service related factors, while the proximal determinants which directly influence use include deterrents like perceived barriers and self efficacy, motivational factors like perceived severity and susceptibility, and paths of action like perceived benefits and cues to action. The outcome of this thesis was use of modern contraceptives among female refugee adolescents which in the long run will lead to reduced adolescent pregnancies. This is as shown in figure 1.

Scope of this thesis

This thesis was limited to assessing the individual/personal factors, inter-personal, community and health service-related factors affecting use, as well as the deterrents such as the determinants of contraceptive use and adherence. The cues to action were studied under peer counselling.

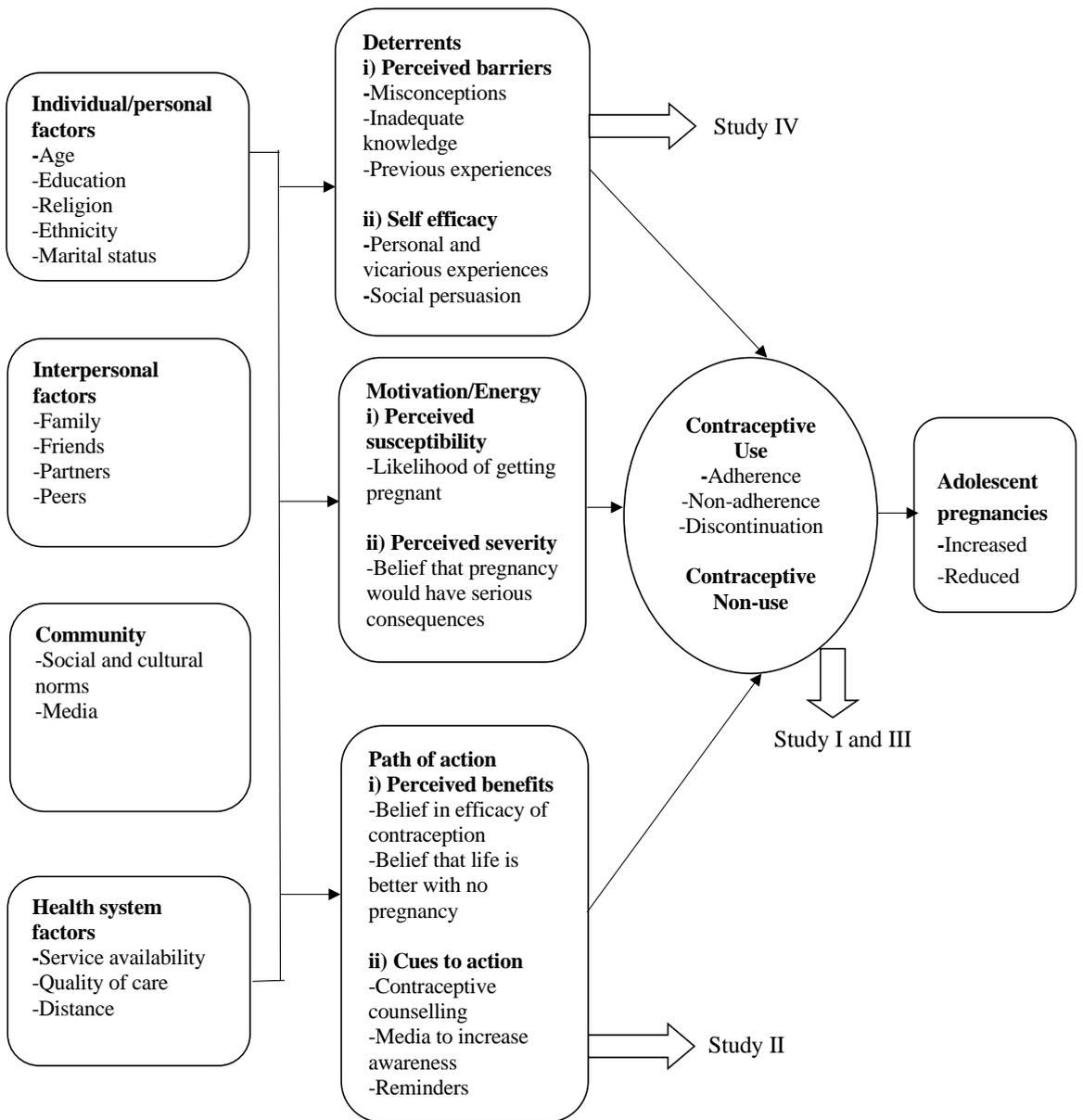


Figure 1: A conceptual framework showing the determinants of contraceptive use among refugee adolescents (*Adapted from Eisen et al., 1985 (91)*).

3.1.2 Theoretical framework

In this thesis, two theories of health behavior were applied to explain the use of modern contraceptives among refugee adolescents from different perspectives. These are; the theory of reasoned action (TRA)/theory of planned behavior (TPB) and the health belief model (HBM) as explained:

- i) **Theory of reasoned action (TRA):** This theory was first developed by Martin Fishbein and Icek Ajzen in 1967 with an aim of explaining the relationship between attitude and behaviour in human actions. That is, predicting how the behaviour of individuals is based on their attitude and intentions (92). In relation to this thesis, this means that an adolescent's decision to use modern contraceptives will depend on pre-existing attitude towards modern contraceptives and their intention of using them. Adolescents with a negative attitude towards modern contraceptives are less likely to use them and vice-versa.
The theory of reasoned action also points out that attitudes and norms predict the intention of behaviour (93). For example, an adolescent's attitude may lead her towards using modern contraceptives but if the norms suggest otherwise, this adolescent may end up not using the contraceptives. Therefore, if we are to increase modern contraceptive use among refugee adolescents, we need to strengthen a normative belief and an attitude that supports modern contraceptive use among refugee adolescents.
- ii) **The health belief model (HBM):** This is a psychological health behaviour change model, developed in the 1950s by social psychologists to explain and predict health-related behaviours, particularly in regard to the uptake of health services (94). This model suggests that people's beliefs about health problems, perceived benefits of and barriers to action, and self-efficacy explain their engagement (or lack of engagement) in those health-promoting behaviours. A stimulus, or cue to action, must also be present in order to trigger the health-promoting behaviour (94). This, in relation to this thesis means, that an adolescent will take up a modern contraceptive if she: i) feels that a negative health condition like unwanted pregnancy can be avoided, ii) has a positive expectation that by taking the modern contraceptives she will avoid the negative condition (unwanted pregnancy) and iii) believes that she can take the modern contraceptives successfully (comfortably and with confidence).

4 RATIONALE

There is a fast growing refugee population worldwide, currently standing at 26.6 million (95). Uganda is hosting the third largest refugee population in the whole world of close to 1.5 million, 81% of whom are women and children (96). Refugees are a very vulnerable population because of the conflict, insecurity and poverty they are faced with. These have left the women and girls at a very high risk of sexual violence, exploitation and abuse, early or forced marriages, and transactional sex. As a result, adolescent pregnancies are higher among refugees and humanitarian settings than anywhere else (97, 98). Adolescent pregnancies aggravate the already existing devastating situation in the refugee population and also have a great implication on the economy.

The Uganda Refugees Act, 2006 states that all refugee women and children shall have equal opportunities and be accorded the same treatment as the nationals (99), and the Uganda Adolescent Health Policy and Service Standards state that adolescents should be provided with adequate information about Adolescent Reproductive Health (ARH) services so as to promote effective use of these services including contraception (50). However, a large percentage of refugee adolescents continue not to use some of these ARH services like contraception.

Strategies and innovations to increase uptake and continued use of modern contraceptives among female refugee adolescents have been barely studied. There is need for us to devise innovative ways to guide decisions on the use of contraception, to promote uptake and sustained use. Therefore, information obtained from this thesis will help improve our understanding of the use of modern contraceptives, the associated factors, effect of peer counselling on acceptance, adherence to use, and the experiences of use among female refugee adolescents in northern Uganda. This will help in programming and designing innovative strategies to improve contraceptive use, and reduce adolescent pregnancies and associated complications among female refugee adolescents in northern Uganda and similar settings. With the reduced adolescent pregnancies, there will be better health for adolescent girls, and with increased knowledge on contraception, adolescent girls will be more empowered to make their own decisions regarding contraception, hence the achievement of gender equality.

5 RESEARCH AIMS

5.1 GENERAL OBJECTIVE

To determine the use of modern contraceptives among female refugee adolescents in northern Uganda: prevalence, effect of peer counselling, adherence and to explore experiences of use.

5.2 SPECIFIC OBJECTIVES

- i) To determine the prevalence and factors associated with modern contraceptive use among female refugee adolescents in northern Uganda.
- ii) To determine the effect of peer counselling on same day acceptance of modern contraceptives among female refugee adolescents in northern Uganda.
- iii) To determine the rates and predictors of adherence to modern contraceptives among female refugee adolescents in northern Uganda.
- iv) To explore the contraceptive experiences of female refugee adolescents in northern Uganda.

6 MATERIALS AND METHODS

6.1 THESIS SETTING

The studies in this thesis were carried out from Palabek refugee settlement located in the northern region of Uganda in Lamwo district (Figure 2). Palabek is the one of the newest refugee settlement in Uganda established in April 2017. It is currently hosting approximately 60,626 refugees most of whom are from South Sudan (100). Women and children comprise of 84% of the total population in this refugee settlement (100).

The settlement is organised into zones, which are further divided into blocks. All the zones and blocks have leaders who were our contact persons before entry into the area. Every block has a community meeting place where block members usually meet when summoned by their leaders for any communication. At our request, block leaders helped to mobilise adolescents within their blocks, and asked them to converge at the community meeting point where we met them and told them about the study.

Palabek has four health centres all of which provide contraceptive services at no cost to all refugees and the host community. The contraceptive services provided include: contraceptive counselling, issuing out condoms and oral contraceptives, inserting and removing IUDs and implants, and giving injectable contraceptives. These services are available to adolescents as well, regardless of their age or marital status.

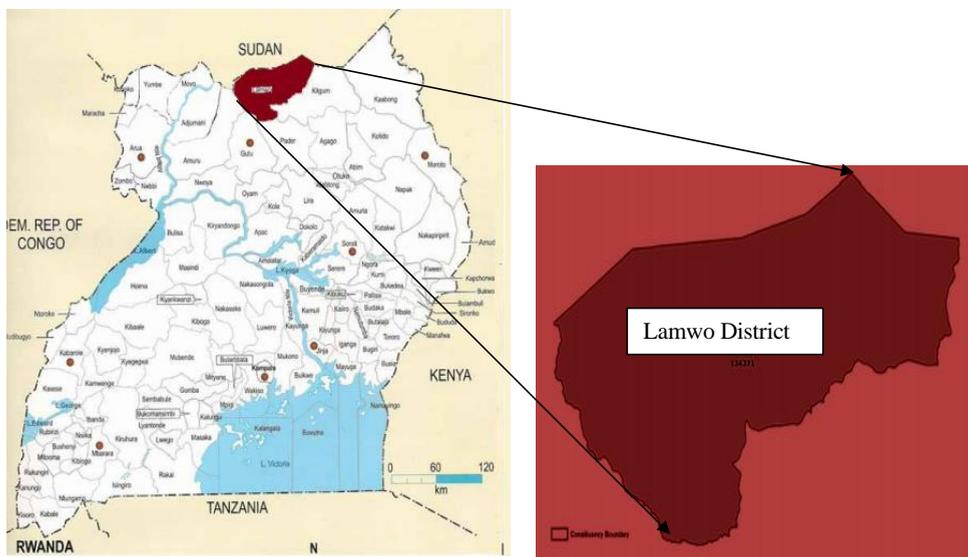


Figure 2: Map of Uganda showing the thesis site

6.2 STUDY DESIGN

This thesis used both quantitative and qualitative methods to answer the research questions. The quantitative methods were employed in studies I, II and III, while the qualitative methods were employed in study IV as summarised in table 2.

Table 2: Summary of methods

Study	Objective	Study design	Study population	Methods/Tools
Study/ Paper/ I	To determine the prevalence and factors associated with modern contraceptive use among female refugee adolescents in northern Uganda	Cross sectional	Adolescents aged 15-19 years in Palabek refugee settlement between May and July 2019	Structured questionnaire
Study/ Paper II	To determine the effect of peer counselling on acceptance of modern contraceptives among female refugee adolescents in northern Uganda	Randomised controlled trial	Adolescents aged 15-19 years in Palabek refugee settlement between May and July 2019	Intervention: peer counselling Control: Routine counselling Structured questionnaires
Study/ Paper III	To determine the rates and predictors of adherence to modern contraceptives among female refugee adolescents in northern Uganda	Prospective single cohort nested in an RCT	Adolescents aged 15-19 years in Palabek refugee settlement who were new starters of modern contraceptives between May and July 2019 and followed up for 6 months till January 2020.	Structured questionnaires Follow up at 1, 3, and 6 months
Study/ Paper IV	To explore the contraceptive experiences of female refugee adolescents in northern Uganda	Explorative qualitative study	Adolescents aged 16-19 years in Palabek refugee settlement with varying experiences of contraceptive use from June to October 2021	In-depth interviews

Recruitment/study flow: The studies in this thesis were interconnected as shown in figure 3.

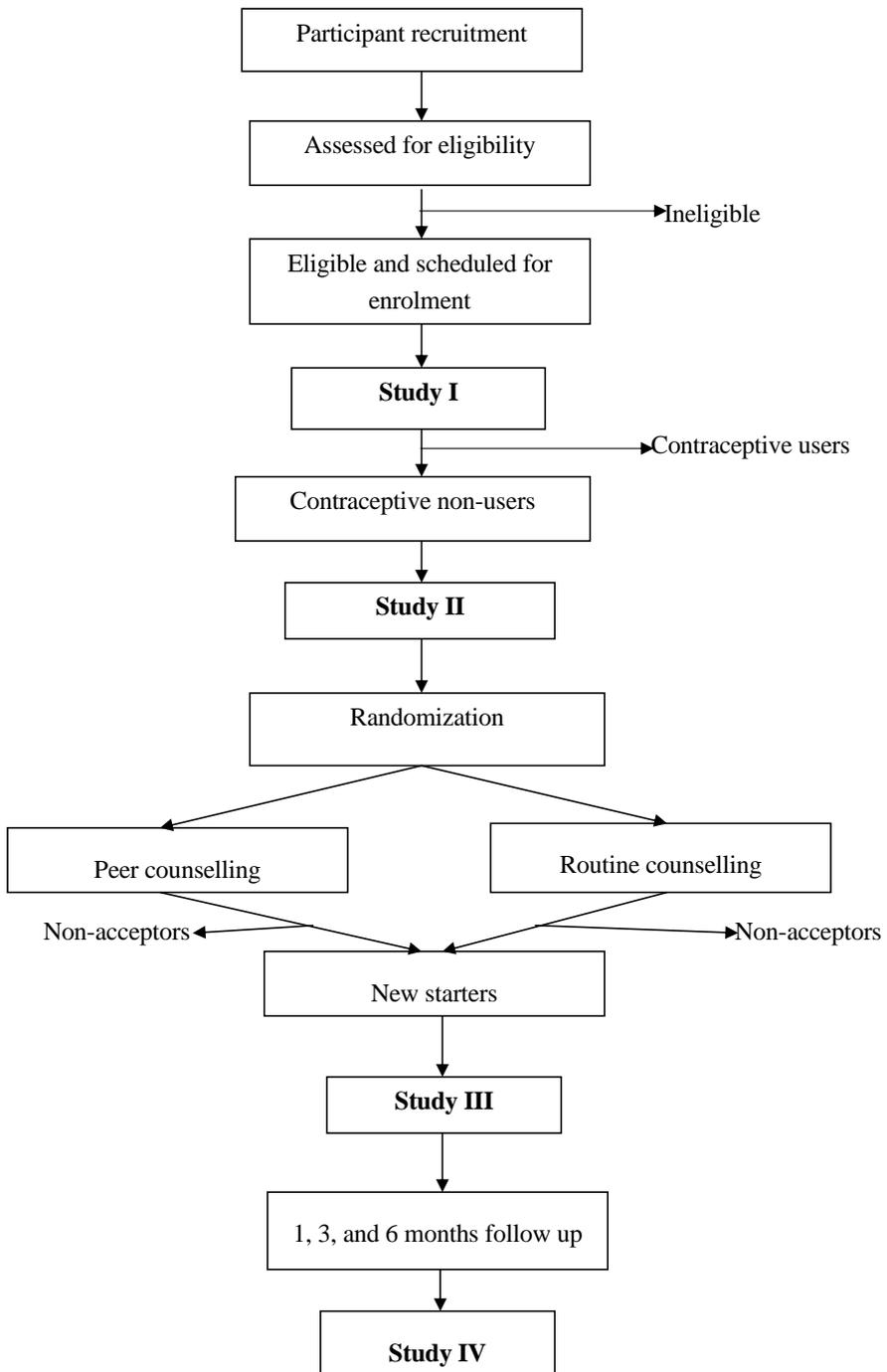


Figure 3: Flow chart of the studies

6.3 STUDY POPULATION

All the studies involved consenting female refugee adolescents aged 15 to 19 years who were sexually active or in-union, wanted to delay child birth, and were residing in Palabek refugee settlement, northern Uganda at the time of the study. Additional inclusion criteria were: not using any modern contraceptive at the time of the study for study II, being a new acceptor of a modern contraceptive for study III, and having ever used a modern contraceptive for study IV. Participants were excluded from any of the studies if they could not comprehend *English, Acholi or Arabic*, the languages commonly used in the camp. Also excluded from the study were participants who were physically or mentally unable to adhere to study procedures.

6.4 SAMPLING PROCEDURE

For studies I and III, adolescents were consecutively enrolled into the study. For study II, participants were randomly assigned to either the intervention or the control group with the use of random numbers. For study IV, respondents were purposively selected to participate in the study based on different characteristics like age, marital status, and type of contraceptive used, until data saturation, a point at which no new themes were being obtained (101). For studies I, II, and III, participant recruitment took place in the communities, at the community meeting places of the blocks/zones, where they had been asked to converge by their leaders (the mobilisers for the study) at our request. The adolescents were then told about the studies, screened for eligibility, and data collected for those who were eligible and consented to participate.

6.5 DATA COLLECTION

For studies I, II, and III, data was collected using interviewer administered structured questionnaires. The interviewers were research assistants who had been trained on all study procedures, quality assurance and control, and ethics regarding research among adolescents. The research assistants were working as village health team (VHT) members in the refugee settlement. The questionnaires used had been pre-tested and piloted. Information obtained using the questionnaires included social demographics, sexual and reproductive history, partner information, and knowledge and use of modern contraceptives.

For study II, the intervention was *peer counselling*, which involved the use of trained peers to offer contraceptive counselling to their fellow adolescents. This was done with the aid of a standardised contraceptive counselling tool developed by the WHO (102), similar to that used by the health professionals at health facilities to offer contraceptive counselling. *Peer counsellors* were three female adolescents who were selected from the study site based on their

verbal interaction abilities, leadership skills, and their social and sexual maturity. The *Control* for this study was routine contraceptive counselling which is as given at the health facilities within the refugee camp as the standard of care. For this study, the routine counselling was done in form of outreach visits to the communities, which are often conducted by the health centres, as part of routine care.

For study III, a contact locator was developed which contained information like the participant's address, telephone numbers and the contact of their 'significant other' who was a relative, spouse or friend. This was recorded to enhance follow up of the participants. Participants were contacted by phone or home visited in the event of a missed appointment. The information collected during follow ups included adherence to the contraceptive, discontinuation from use, the reason for discontinuation, switching to another contraceptive method, method switched to, reasons for the switching, and the experienced side effects. A participant was regarded as non-adherent if: i) she was found pregnant at any time, ii) missed her appointment for a refill for either oral or injectable contraceptive and iii) missed taking three or more oral contraceptives during the month according to the Guttman scale (103). Self-reported non-adherence was used for the other contraceptive methods. Participants who reported pregnant had to undergo an assessment by the research assistants to ascertain whether the pregnancy was due to method failure or non-adherence.

For study IV, data collection took place both in the community and at the health centre depending on the respondent's convenience. Respondents had been approached individually by one of the research assistants who informed them about the study a day before, so that they could make an appointment for the interview if they were interested in participating in the study. Data was collected using individual, face-to-face, in-depth interviews, with the help of an interpreter (due to language barrier) and a note taker. The interviews were conducted by RB, after receiving training on conducting in-depth interviews. Interview questions, prompts and guides with open ended questions, which had been pretested and piloted were used. The interview guide included questions on contraceptive decision-making, challenges with access and use of contraceptives, and how they dealt with the challenges. These were followed by probing questions and follow-up questions where necessary. The interviews were audio recorded and transcribed verbatim.

6.6 DATA ANALYSIS

All quantitative data for studies I, II, and III were analysed using STATA version 14.0. Continuous variables, if normally distributed, were reported as means and standard deviations, and as medians and ranges if skewed. Categorical variables were summarised as percentages and proportions.

For study I, modern contraceptive use was analysed as a categorical variable, with use of modern contraceptives coded as “1” and non-use as “0”. *Prevalence* of modern contraceptive use was calculated as a percentage of refugee adolescents currently using any modern contraceptive method over the total number of participants in the study. *Factors associated with modern contraceptive use* were assessed using the logistic regression.

For *study II*, *acceptance of a modern contraceptive method* was analysed as a categorical variable, with acceptance of a method coded as “1” and non-acceptance as “0”. Percentages of acceptors in the two groups were obtained and the Chi-square test used to compare acceptance between the two study groups. *Factors associated with contraceptive acceptance* were estimated using the modified poisson regression model due to the high prevalence of acceptance.

For *study III*, *adherence to contraceptives* was analysed as a categorical variable, with adherence coded as “1” and non-adherence as “0”. Percent adherence at the different follow up times was also computed. *Factors associated with adherence* were estimated using the Generalised Estimation Equations (GEE) with the exchangeable correlation matrix, family as binomial and the link as logit. Robust standard errors were used in the GEE analysis. Both intention to treat (ITT) and per protocol analyses were conducted in order to account for those who were lost to follow up.

During the bivariate analysis for studies I, II and III, all the variables that gave a p-value ≤ 0.2 were considered for multivariate analysis, together with other variables which are considered of significance according to previous research even though their p-values were greater than 0.2. At the multivariate analysis, variables were regarded as statistically significant if they had a p-value less than 0.05. The significant variables at this stage were tested for interaction by forming two-way product terms of the variables. A model involving the product terms was run and a chunk test done to assess for presence of interaction. Where necessary, confounding was assessed for. A variable was considered a confounder if it caused a greater than or equal to 10% change in the measure of association. Odds/prevalence ratios along with their 95% confidence intervals were stated.

For *study IV*, collected data transcripts were entered and analyzed in Microsoft Excel, where data was sorted and coded. Inductive thematic analysis was used to analyse the data, by identifying patterns or themes according to Braun and Clarke, 2006 (104). Initial codes were generated, which were later examined to identify themes. Both latent and manifest themes were used for this analysis whereby we sought to identify underlying ideas, assumptions and ideologies from the data, as well as taking the information as stated by the respondents. The generated themes were later reviewed and defined.

6.7 DATA MANAGEMENT

Data storage: All data was checked for accuracy, completeness and consistency at the close of each day, and any identified errors were corrected immediately. The data was then double entered into Epidata (for quantitative data) and backed up on another external device. All stored data was password protected and only accessible to authorised personnel. Study related source documents for each participant were placed into a study file and kept in a secure cabinet.

Data quality control:

Training: All research assistants were trained on all study procedures beforehand by the study investigator.

Reproducibility: Questionnaires were translated to *Arabic* and *Acholi* which are the widely spoken languages in the camp, and back translated using qualified and competent persons to ensure that the meaning was not altered. The questionnaires were also pretested using women from the study site to check for feasibility as a data collection tool, and adjustments made where necessary.

Manuals and SOPs: Manuals of Standard Operating Procedures were developed for all study related procedures and protocols. The investigator and the research assistants were trained in the SOPs and study protocol. Regular meetings and retraining were conducted throughout the study in order to maintain standards of data collection.

6.8 ETHICAL CONSIDERATIONS

The studies in this thesis involved obtaining confidential information on contraceptive and SRH behaviours of female refugee adolescents, a very vulnerable population. The following ethical considerations were put into practise to safeguard their confidentiality and autonomy.

Permission to carry out this study was obtained from Makerere University School of Medicine Higher Degrees Research Ethics Committee (REC REF 2018-059), and from Uganda National

Council of Science and Technology (SS 4876). Administrative clearance was also obtained from the Office of the Prime Minister, Department of Refugees, for permission to carry out research among refugees. Some of the data transcripts for paper IV were analysed from Sweden, so we obtained additional clearance from the Swedish Ethical Review Authority (ref. nr. 2021-06233-01).

Written informed consent was obtained from all participants before enrolment into the study. The consent was obtained after informing the participants of all the study procedures, and the benefits and risks of participating in the study. Participants were further informed that their participation was completely voluntary, and that they had the right to withdraw from the study at any point in time without giving reason, and with no consequences to their withdrawal. Parental consent was not sought for participants below 18 years. This was so because the National Policy Guidelines and Service Standards for Sexual and Reproductive Health and Rights state, that all individuals seeking family planning services are eligible to receive the services regardless of their age, and without need for verbal or written consent from parent, guardian or spouse, as long as they have received prior education or counselling about the contraceptives (105).

For purposes of confidentiality, participant names or any identifying information was not used, but rather, unique identifiers like patient numbers were used for all participants. Furthermore, questionnaires and consent forms were kept away from non-research staff and securely locked away. Audio recordings were kept separately in password protected computers that only the investigator had access to. To further strengthen confidentiality, all interviews were conducted in a private place, where conversations could not be over heard.

A counsellor was available at the health centre to offer free individual counselling to all the participants who needed it. The counsellor's telephone number was also provided to the participants who preferred to call.

7 RESULTS

7.1 SUMMARY OF FINDINGS

The findings from the four studies are summarized in table 3 below. Further details of the findings are following after the table.

Table 3: Summary of findings from the thesis

Study	Objectives	Main findings
Study I	To determine the prevalence and factors associated with modern contraceptive use among female refugee adolescents in northern Uganda	<p>*The prevalence of contraceptive use was 8.6%, yet over 70% of the participants did not want to have a child soon</p> <p>*Reasons for non-use of contraceptives were: fear of side effects, partner prohibition and wanted to delay child birth</p> <p>*Being married/cohabiting and having an older partner were the factors associated with non-use of modern contraceptives</p>
Study II	To determine the effect of peer counselling on acceptance of modern contraceptives among female refugee adolescents in northern Uganda	<p>*Participants who received peer counselling were 24% more likely to accept a contraceptive method than those who received routine counselling</p> <p>*Commonest reasons for non-acceptance in both groups were fear of side effects and partner prohibition</p> <p>*Participants whose partners had acquired up to tertiary education were more likely to accept a method than those whose partners had less education</p>
Study III	To determine the rates and predictors of adherence to modern contraceptives among female refugee adolescents in northern Uganda	<p>*Adherence was generally low and kept reducing over time, with 44% adherence at 6 months</p> <p>*Reasons for non-adherence were side effects and partner prohibition</p> <p>*Participants using LARCs were more likely to adhere than those who were using SARCs</p>
Study IV	To explore the contraceptive experiences of female refugee adolescents in northern Uganda	<p>*Peers, partners and parents of the respondents played an important role in influencing contraceptive use among the respondents</p> <p>*Peers who had good experience with contraceptive use encouraged the respondents to use contraceptives and vice versa</p> <p>*Respondents who were married or had ever given birth were encouraged by their parents to use contraceptives while the unmarried were prohibited</p>

7.2 PREVALENCE AND FACTORS ASSOCIATED WITH MODERN CONTRACEPTIVE USE (PAPER I)

A total of 839 female refugee adolescents aged 15 to 19 years were enrolled in this study. The mean age of the participants was 18.3 years ($SD=0.83$). Most of the participants were either married or cohabiting (64.8%), had ever been pregnant (70.4%) with over 73% reporting at least one unintended pregnancy as shown in table 4. Most of the participants had ever heard about modern contraceptives (90.3%) and most common source was from a health worker (67.7%). Majority of the participants knew at least two modern contraceptive methods (82.1%), with condoms as the most commonly known method (70.3%). Almost all the participants (99.6%) mentioned that the only place where one would get contraceptives was the health centre, and over 70% reported that there was no accessible contraceptive source within 30 minutes' walk from their homes.

The prevalence of modern contraceptive use was 8.7% (95% CI: 7.0-10.8). The most commonly used methods were the injectables (42.5%) and the implant (35.6%). Most of the users had used their contraceptives for only six months or less (59.7%). The commonest reasons for non-use of modern contraceptives were fear of side effects (39.3%) and partner prohibition (16.4%).

The factors that were significantly associated with modern contraceptive use at the bivariate analysis were age ($p=0.153$), number of children alive ($p=0.081$), marital status ($p=0.079$), partner's age ($p=0.007$), and partner's occupation ($p=0.073$). The variables "education" and "ever been pregnant" were also included even though their p -values were greater than 0.2, because they have been reported to be significantly associated with modern contraceptive use among adolescents from previous research. In the multivariate analysis, the variables that were significant were being married (aOR = 0.11, 95% CI: 0.04 to 0.35, $p < 0.001$), cohabiting (aOR = 0.43, 95% CI: 0.20 to 0.93, $p = 0.032$) and having an older partner (aOR = 0.93, 95% CI: 0.86 to 0.99, $p = 0.046$). These were checked for interaction between each other using the chunk test and for confounding with other variables which had been significant at bivariate analysis. Nevertheless, there was neither interaction nor confounding. Therefore, the variables that were significantly associated with non-use of modern contraceptives were marital status and partner's age.

Table 4: Background characteristics of the participants

Variable	Number (N = 839)	Percentage (%)
Age		
15-17	116	13.8
18-19	723	86.2
Religion		
Catholic	440	52.4
Anglican	193	23.0
Moslem	1	0.1
Adventist	66	7.9
Other (Pentecostal, Lutheran, Evangelical church)	139	16.6
Ethnicity		
Acholi	659	78.6
Dinka	19	2.2
Nuer	18	2.1
Lotuho	46	5.5
Other (Bari, Shilluk, Luo)	97	11.6
Education		
None	81	9.7
Primary	595	70.9
Secondary	148	17.6
Tertiary	15	1.8
Occupation		
Self-employed / Employed	33	3.9
Unemployed	335	39.9
Peasant farmer	305	36.4
Student	166	19.8
Marital status		
Single	233	27.8
Cohabiting	381	44.4
Married	163	19.4
Separated/Divorced/Widowed	62	7.4
Duration in the camp		
≤ 12 months	135	16.1
> 12 months	704	83.9
Age at first sex (mean=16, SD = 1.09)		
12 to 15	169	20.1
16 to 17	537	64.0
18 to 19	133	15.9
Ever been pregnant		
Yes	591	70.4
No	248	29.6
Partner's age* (Median= 26, Range=16 to 60)		
16 to 25	281	43.5
26 to 35	331	51.3
36 – 60	30	4.6
Partner's Education		
None	13	2.0
Primary	190	29.4
Secondary	423	65.5
Tertiary	20	3.1
Partner's Occupation		
Self-employed / Employed	193	29.9
Unemployed	267	41.3
Peasant farmer	129	20.0
Student	57	8.8

7.3 EFFECT OF PEER COUNSELLING ON ACCEPTANCE OF MODERN CONTRACEPTIVES (PAPER II)

In the randomized controlled trial, 732 female refugee adolescents were assessed for eligibility. Only 588 of these were enrolled into the study because 192 could not meet the inclusion criteria and 42 declined to participate. Further details of the trial profile are presented in the published paper II at the end of the thesis. The 588 were randomized to either peer counselling or routine counselling with 294 participants in each arm. Amongst these, some did not receive the allocated counselling and some dropped off before outcome assessment. Therefore, only 516 were included in the data analysis.

Most of the background characteristics were equally distributed in the two study groups. The outcome variables that differed in the two groups were acceptance of a modern contraceptive method and reasons for non-acceptance. Acceptance of modern contraceptives was more in the intervention group compared to the control group (58.5% vs 49.6%). Fear of side effects was the commonest reason for non-acceptance of a method in the routine counselling group, while lack of time was the commonest reason for non-acceptance in the peer counselled group (table 5).

Participants who received peer counselling were 24% more likely to accept a contraceptive method than those who received routine counselling (PR=1.24, 95% CI: 1.03 to 1.50, p=0.023). The other factor that was significantly associated with same day acceptance of a contraceptive method was partner's education (PR=1.45, 95% CI: 1.02 to 2.06, p=0.037); participants whose partners had acquired tertiary education were 45% more likely to accept a contraceptive method than those whose partners had less education.

Table 5: Primary and secondary outcomes by study group

Outcome	N	Peer counselling	Routine counselling	p-value
Same day acceptance of a modern contraceptive				
Yes	279	151 (58.5)	128 (49.6)	0.013
No	237	107 (41.5)	130 (50.4)	
Change in willingness to accept a contraceptive method				
Positive change	112	55 (21.3)	57 (22.1)	0.933
Negative change	15	7 (2.7)	8 (3.1)	
No change	389	196 (76.0)	193 (74.8)	
Reasons for non-acceptance				
Infrequent sex	3	2 (1.9)	1 (0.7)	<0.001
Cultural/religious prohibition	43	17 (15.9)	26 (20.0)	
Partner prohibition	52	29 (27.1)	23 (17.7)	
Fear of side effects	81	25 (23.4)	56 (43.1)	
Lack of knowledge	9	1 (0.9)	8 (6.2)	
No time to go to health centre	49	33 (30.8)	16 (12.3)	

7.4 ADHERENCE TO MODERN CONTRACEPTIVES (PAPER III)

A total of 272 new starters of modern contraceptives were enrolled into this prospective cohort study nested within the RCT. Most of the participants were older adolescents aged 18 to 19 years (86.8%), had attained up to primary as their highest level of education (73.5%), were cohabiting (46.0%), and had ever been pregnant (67.3%). The injectable was the most commonly used contraceptive method at baseline (45.6%), followed by the implant (31.3%).

Adherence to modern contraceptives among the participants was generally low and kept reducing over time, with only 44.7% having adhered for the six months of the study. Some of the participants (6.3%) switched from one contraceptive to another due to side effects, and convenience of use. Another 8.8% of the participants discontinued use of contraception because of side effects (57.1%), partner prohibition (23.8%) and the wish to have a child (19.1%). Moreover, 13 (5.2%) of the participants were found pregnant at the end of the 6 months of the study, and the pregnancies were ascertained to be a result of non-adherence or discontinuation, and not method failure. A considerable number of participants (44.0%) were lost to follow up. However, there was no difference in social demographics between those who were lost to follow up and those who completed the study as shown in table 6.

The factors that were associated with adherence to modern contraceptives were type of contraceptive and duration of use; participants who were using LARCs were more likely to adhere to their contraceptives than those who used SARCs (aOR: 3.37, 95% CI: 1.914 to 5.937, $P < 0.001$). In addition, participants were less likely to adhere at 3 months (aOR: 0.12, 95% CI: 0.067 to 0.203, $p < 0.001$) and 6 months (aOR: 0.03, 95% CI: 0.019 to 0.063, $p < 0.001$) compared to one month.

Additional analyses were conducted which included per protocol analysis and sensitivity analysis. These showed similar findings to those obtained from the intention to treat analysis. Details of these additional analyses can be found in the appended paper III.

Table 6: Baseline characteristics of participants who were lost to follow up compared to those who completed the study

Variable	Completed follow up (n=159)	Lost to follow up (n=113)	P-value
Age in years			0.778
15-17	20 (12.8%)	16 (14.2%)	
18-19	139 (87.4%)	97 (85.8%)	
Education			0.261
None	8 (5.0%)	9 (7.9%)	
Primary	120 (75.5%)	80 (70.8%)	
Secondary	28 (17.6%)	22 (19.5%)	
Vocational training	3 (1.9%)	2 (1.8%)	
Marital status			0.311
Single	44 (27.7%)	36 (31.9%)	
Cohabiting	73 (45.9%)	52 (46.1%)	
Married	33 (20.8%)	17 (15.0%)	
Divorced/separated	9 (5.6%)	8 (7.0%)	
Ever been pregnant			0.535
Yes	108 (67.9%)	75 (66.4%)	
No	51 (32.1%)	38 (33.6%)	
Type of counselling			0.438
Peer counselling	88 (55.3%)	59 (52.2%)	
Routine counselling	71 (44.7%)	54 (47.8%)	
Type of contraceptive			0.063
Condom	7 (4.4%)	12 (10.6%)	
Oral contraceptive	21 (13.2%)	21 (18.6%)	
Injectable	77 (48.4%)	47 (41.6%)	
LARC	54 (34.0%)	33 (29.2%)	
Partner's age			0.746
18 to 25	56 (35.2%)	40 (35.4%)	
26 to 35	58 (36.5%)	36 (31.9%)	
36 to 60	7 (4.4%)	5 (4.4%)	

7.5 CONTRACEPTIVE EXPERIENCES OF ADOLESCENTS (PAPER IV)

In this explorative qualitative study, 24 in-depth interviews were conducted among adolescents who had varying experiences with use of modern contraceptives. Most of the respondents (63%) were older adolescents aged 18 to 19 years, had primary education as their highest level of education (83.3%), and were currently using a modern contraceptive (70.8%), as shown in table 7.

Table 7: Characteristics of the respondents

Characteristics	Number (n=24)	Percentage (%)
Age		
16	4	16.7
17	5	20.8
18	3	12.5
19	12	50.0
Education		
Primary	20	83.3
Secondary	4	16.7
Years in the camp		
1.5-2 years	2	8.3
3-4 years	22	91.7
Marital status		
Unmarried	13	54.2
Married	9	37.5
Separated	2	8.3
Parity		
0-1	21	87.5
2-3	3	12.5
Contraceptive use		
Currently using	17	70.8
No current use	7	29.2

The findings were summarized into one overarching theme and two sub themes. The overarching theme is, “Contraceptive influence as reflections and reinforcement of established social norms”. The sub-themes were: i) The role of interpersonal relationships in contraceptive use: support, discouragement and prohibition, and ii) The role of institutions in contraceptive use: shaping attitudes and fostering motivation (figure 4).

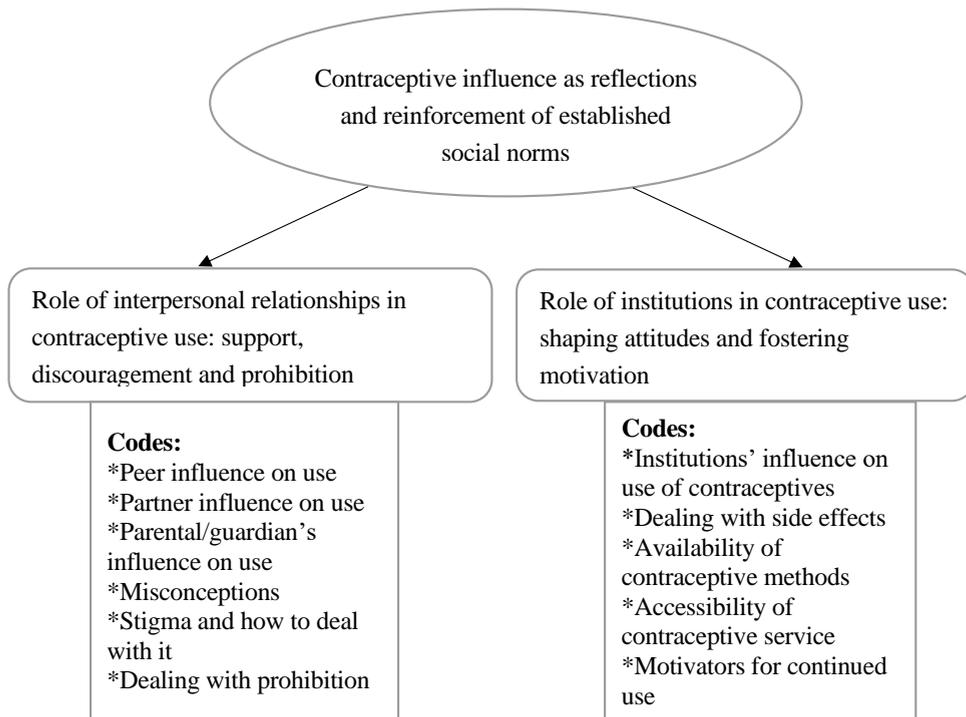


Figure 4: Figure showing theme, sub-themes and corresponding codes

7.5.1 Theme: Contraceptive influence as reflections and reinforcement of established social norms

The main theme explains how the social norms within the community guide the contraceptive decisions made by adolescents, and their key influencers like peers, partners and parents/guardians. Information obtained from the respondents confirmed that according to the social norms in the community, it is prohibited for young girls to get involved in pre-marital sexual activity, and therefore should not use contraceptives. This norm dictated whether peers, partners or parents would support, discourage or prohibit use of contraceptives among the respondents. However, in spite of the norms, some respondents went ahead and used contraceptives because of the perceived benefits. Some of these respondents suffered stigma and abuse from the community members who found out that they were using contraceptives.

7.5.2 Sub-theme I: Role of interpersonal relationships in contraceptive use: support, discouragement and prohibition

Interpersonal relationships of the respondents like peers, partners and parents/guardians greatly influenced contraceptive decision making and use among the respondents. These close relations either supported, discouraged or prohibited use. Those who encouraged use did so because of the perceived benefits while the discouragement and prohibition reflected the established social norms in the camp and the wider community.

According to the respondents, some peers supported use while others discouraged and stigmatized those who were using contraceptives. Respondents relayed that the peers who encouraged them to use contraceptives did so because of the benefits of contraception like delaying child birth, child spacing and better planning for the future. This served to enable them to continue with and complete their education, and get good sources of income to take care of themselves and their children. The peers who discouraged the respondents from using contraceptives did so because of the misconceptions about contraceptives, that when they use contraceptives they will become barren and never have a child again, or that they will produce a child with physical impairments like blindness or lameness. Other peers stigmatized the respondents for using contraceptives based on the norms that prohibit pre-marital sexual activity and contraception as shown in the quote below;

My friends who found out, they abused me and told me that I am going to suffer in future. That I will suffer looking for a child and I won't get any. If I am lucky enough to produce, the child will have a big head or will be lame (R21, 16 years, parity 0, current user).

Concerning the partners, the respondents shared that some partners encouraged and supported contraceptive use while others prohibited them. Respondents who were still in school together with their partners received encouragement and support from the partners to use contraceptives so that they could first complete their education. Multiparous respondents were also encouraged by their partner to use contraceptives so as to space their children. According to some respondents, partners prohibited contraceptive use because of fear of side effects and misconceptions. However, some respondents decided to use contraceptives clandestinely after they had been prohibited by their partners. One of the respondents narrated:

But for me, my partner said family planning is not good, that some time to come may be I will deliver a child who is lame, and disabled. So he refused and was very annoyed. That is why I decided to go and remove the implant, because, that implant, whenever I'm with him, he sees it and he finds out. Now, with this injectable he does not even know that I am using it (R5, 19 years, parity 1, current user).

Respondents also spoke of parents and guardians as key influential people in contraceptive decision making. Married respondents with children were encouraged by their parents to use contraceptives so as to space their children, while those who were unmarried were prohibited by their parents because it would promote pre-marital sexual activity. However, some of the unmarried respondents went ahead and used contraceptives clandestinely without informing their parents because they knew that the parents would not allow them as indicated below:

No, I did not tell them (my parents). Because I don't think she (my mother) will agree. So I decided not to tell her. She does not want to see me with any man. I don't want her to know that I have someone (R12, 18 years, parity 0, current user).

7.5.3 Sub-theme II: Role of institutions in contraceptive use: shaping attitudes and fostering motivation

According to the respondents' accounts, schools and health care institutions played an important role in shaping attitudes and fostering motivation for continued use of contraceptives among the participants. Most of the respondents said that they obtained contraceptive information from schools and health care institutions. Teachers in schools always advised the respondents against the dangers of adolescent pregnancy and that contraception would help them avoid unwanted pregnancy. One of the respondents shared her experience:

I had heard about it from school. Teachers used to tell us that we should not go for marriage when we are still young. If you have a boyfriend or a lover you just go with him, you talk, you go to the health centre so that they help you and you will be able to continue with your school (R18, 19 years, parity 1, current user).

The main role of health care institutions in adolescent contraception was, according to the respondents, offering contraceptive counselling, dispelling misconceptions, and providing contraceptives to those in need of them. Respondents mentioned that the nurses at the health centres were very supportive of the decision to use contraceptives, welcomed them very well, and offered them remedy in case of side effects. One of the respondents narrated that even though she experienced a few side effects, she knew that it was normal because of the information she received at the health centre, as illustrated in the quote below:

When I got this family planning, I stayed like 3 months without seeing my period. Then in June, I got the period. But now, up to today, I have never got it again, but I am not feeling any pain, and I am not worried because they told me at the health centre that I will get some of these side effects when I use family planning. (T14, 17 years, parity 1, current user).

8 DISCUSSION

This thesis aimed to assess the use of modern contraceptives among female refugee adolescents in northern Uganda. It focusses on prevalence, effect of peer counselling, adherence and experiences of contraceptive use. The findings indicate that contraceptive use was generally low, despite the fact that many of them did not want to get pregnant. Adolescents who were married or cohabiting, and those with older partners were less likely to use contraceptives (Paper I). In addition, peer counselling proved effective in increasing acceptance of modern contraceptives among the participants, although those with more educated partners were more likely to accept a method than those whose partners were less educated (Paper II). Generally, adherence to modern contraceptives was low and reduced over time. Participants who were using LARCs were more likely to adhere to their contraceptives than those who were using SARCs (Paper III). Finally, interpersonal relationships (peers, partners and parents/guardians) of the respondents, together with institutions like schools and health care played a significant role in influencing contraceptive use and decision making among female refugee adolescents (Paper IV).

8.1 GENDER-POWER IMBALANCE; A HINDRANCE TO MODERN CONTRACEPTIVE USE AMONG ADOLESCENTS

Gender-power imbalance is a state in which women are accorded less power than men in the family and society, and are expected to be subservient to men as in patriarchal societies (106). This leaves women with a lower negotiating power in several aspects, including their sexual and reproductive health and rights (SRHR). The negotiating power is much lower among female adolescents in patriarchal societies compared to adult women as explained by the theory of gender and power (107). The findings below illuminate gender-power imbalance as a hindrance to modern contraceptive use among the participants.

According to the findings from this thesis, a very low use of modern contraceptives was recorded, yet most of the participants wanted to delay child birth. The contraceptive prevalence rate is much lower than that in the general population in Uganda of over 30% (108-110). This low contraceptive use, also reported in other studies among refugee adolescents (23, 55, 111-113), was attributed to fear of side effects and partner prohibition (22, 23, 110, 114). Partner prohibition highlights gender-power imbalance within this community.

Furthermore, being married/cohabiting and having an older partner were significantly associated with non-use of modern contraceptives, as observed in this thesis. A similar observation was reported by Guttmacher institute in a study to determine patterns of

contraceptive use with teenagers' first sexual relationships (115). The association further points to gender-power imbalance, that adolescents with older partners could have been prohibited by their partners from using contraceptives. Gender-power imbalances are exacerbated by an increase in the age differences between couples (116, 117). Partner prohibition is mentioned to be a result of not only male dominance, but also inadequate knowledge on contraceptives, perceived side effects of the contraceptives, and a desire for large families for prestige (118-120).

8.2 PEER COUNSELLING INCREASES ACCEPTANCE OF MODERN CONTRACEPTIVES

Findings from this study confirm that peer counselling is beneficial in increasing the use of modern contraceptives among female refugee adolescents. Acceptance of a modern contraceptive method was 24% higher in the peer counselled group than in the routine counselled group. Similar studies have reported benefits of peer counselling for contraception among adolescents in increasing contraceptive knowledge (44, 45), and in reducing adolescent pregnancies (80). Available knowledge on influence of peers in adolescence has shown that adolescents ascribe greater importance to the behaviors and norms of their peers, and easily adopt their behaviors to fit in (8, 47, 121, 122).

Partner's education was the only factor found to be significantly associated with acceptance of modern contraceptives among the participants. Participants whose partners had acquired up to tertiary education were more likely to accept a method than those whose partners had less education. This finding can be affirmed by studies which found that highly educated men with secondary education or more easily took up and relied on contraception than those who had less education (123-126). This association can be explained by the fact that educated partners will offer more support to their partners in several sexual and reproductive issues including contraception (119, 127, 128). This further points to the role of partners in contraceptive use among refugee adolescents.

8.3 BETTER ADHERENCE WITH LARC METHODS THAN WITH SARC METHODS

Only less than half of the participants had adhered to their contraceptives by the end of the six months of the study. Similar findings of low adherence have been reported by other studies among adolescents (16, 83, 85, 129, 130). The commonest reasons for poor adherence and discontinuation were side effects and partner prohibition which are reported by other studies as well (17, 82, 83, 85). LARC users were more likely to adhere to contraceptives than SARC users. This is in correspondence with findings from other studies assessing adherence to

contraceptives among adolescents (83, 85, 87, 130). This can be explained by the fact that LARCs are not dependent on user behavior which makes it easier to use them. LARCs are also convenient to use, have lower failure rates, less side effects and hence a higher user satisfaction rate (131-136). All these attributes contribute to the higher adherence rates among LARC users.

8.4 INTERPERSONAL RELATIONSHIPS INFLUENCE CONTRACEPTIVE USE AND DECISION MAKING OF RESPONDENTS

In this study to explore the contraceptive experiences of female refugee adolescents in northern Uganda, we found that close relations of the participants like their peers, partners, and parents influenced contraceptive use among the participants.

According to the respondents' accounts, peer influence stood out in their use of contraception. Peers who had had a good experience using contraception encouraged the respondents to use contraception, and the peers who had had a bad experience discouraged the respondents from use. Other peers simply discouraged use because of misconceptions. These findings are in line with those from other studies (137-139) where peer influence significantly affected contraceptive use and decision making. This can be explained by the assertion that adolescents assign more priority to and easily take up behaviors of their peers compared to other ages (121).

Most of the respondents revealed that their partners were supportive of their decision to use contraception except for a few whose partners were prohibitive. Partner prohibition has stood out in several studies as a barrier to contraceptive use among adolescents, citing that respondents who had older partners were more likely to prohibit contraception (22, 23, 137, 140). Partner prohibition was attributed to fear of side effects, misconceptions, desire to have a child, and male dominance as reported in other studies (118, 141).

From the respondents' information, we noticed that parents whose daughters were already married encouraged them to use contraception. This was so because of the benefits of contraception in child spacing, and the freedom (both physical and financial) that comes with having less children. This has been highlighted by similar studies among adolescents (138, 142). Some parents discouraged contraception, especially among adolescents who were not married. This finding has been reported in another qualitative study among adolescents in Malawi (143). Parental discouragement is attributed to the cultural norms that are against involvement of young unmarried girls in sexual activity. The role of cultural norms in contraceptive use among adolescents has been highlighted in other studies as well (23, 144-146). Adolescents who went against these norms and used contraception were often

stigmatized by their peers and community at large. Similar findings have been reported by other studies among adolescents (140, 144, 147).

8.5 INSTITUTIONS SHAPING ATTITUDES AND FOSTERING MOTIVATION FOR CONTRACEPTIVE USE

Schools and health care institutions played a significant role in shaping attitudes and fostering motivation for continued use of contraception among the participants. These contributed mainly through offering accurate contraceptive information to the respondents. These should be further encouraged and supported.

Health care institutions played the largest role in contraception among the respondents. These not only provided contraceptive methods and counselling, but also supported the respondents, dispelled misconceptions, and provided aid in case of side effects. The role of the health care institutions has been reported in previous studies among women in Uganda where this also stood out as a main theme (19). Strengthening the health care to better support adolescent services would be of great importance.

The commonly reported barriers or challenges for use cited by the respondents were side effects, prohibition from partners, stigma and distance to health care. These challenges have been reported in other qualitative studies among adolescents (90, 148) and other non-adolescent studies in Uganda (19), Kenya (18) and Pakistan (20). In spite of the challenges faced by the respondents, they were highly motivated to continue using contraception. This is so because the perceived benefits of contraception out-weighed the challenges they faced. This motivation to keep using has been reported by other studies (18, 19).

8.6 METHODOLOGICAL CONSIDERATIONS

This thesis used both quantitative and qualitative techniques to understand the use of modern contraceptives among female refugee adolescents in northern Uganda. Below, we highlight the strengths and limitations of the studies included in this thesis.

Strengths of the studies

Large/adequate sample size: Studies I and II used sample sizes that were adequate according to the sample size estimation. This gave the studies a power high enough to answer the research questions and to seek for necessary associations between the variables.

Use of standardised approaches: All the studies in this thesis used standardised approaches to obtain information from the participants. All study tools had been pre-tested and piloted to ensure that they are applicable to obtain the necessary information. The tools had also been

translated to languages that the adolescents could understand and, back-translated by qualified and competent persons to ensure that the meaning was not altered. These procedures were carried out to minimize potential misclassification bias. Use of standardized approaches further increases the repeatability and replicability of our study findings.

Randomization and blinding: Study II used random assignment of participants to either the intervention or control groups. Randomisation ensures that all characteristics are equally distributed between the groups, hence eliminating selection bias. Furthermore, the outcome assessor was blinded to minimize performance or assessment bias.

Study limitations

Generalizability: Studies I and III used consecutive sampling to recruit participants into the studies. Consecutive sampling is non-random which reduces the representativeness of the sample, making the results less generalizable. However, this limitation was minimized by obtaining the study sample from all parts of the refugee settlement. In addition, study IV may not be generalizable to all adolescents because most of the respondents were older adolescents aged 18 to 19 years. This was so because the younger adolescents usually prefer not to participate in such studies for fear of being judged that they are sexually active.

Social desirability bias: This thesis sought to obtain private, sensitive and confidential information from the participants. This subjected it to social desirability bias whereby participants may choose to not tell the truth, but to give responses that are more socially acceptable to avoid being judged (149). However, this was minimized by conducting interviews in a private and friendly environment where conversations could not be over heard, and by assuring participants that their confidentiality will be maintained through using number codes instead of their names.

Attrition bias: This occurs when participants are disproportionately lost from the study groups (150). In studies II and III, some participants were not included in data analysis because they were lost to follow up. This could have led to under-estimation of the study outcomes, and failure to detect associations which could have otherwise been present. However, we carried out extra-analyses to confirm that those who were lost to follow up were not different from those who were involved in the analysis.

Short follow up time: Study III followed up participants for only six months. This follow up period may have been inadequate for us to obtain adequate information on participants' adherence to LARC methods.

9 CONCLUSIONS

This thesis assessed modern contraceptive use among female refugee adolescents: the prevalence, the effect of peer counselling, adherence, and experiences of contraceptive use.

Use of modern contraceptives was low, with less than a tenth of the participants using a contraceptive method, and yet they were all sexually active with no desire to have a child soon. This left them vulnerable to unplanned adolescent pregnancy and associated complications. The commonest reasons for non-use of contraceptives were fear of side effects and partner prohibition. Participants who were married or cohabiting, and those with older partners were less likely to use a contraceptive method. This implies a gender-power imbalance in adolescent decision making, which exposes the girls to sexual and reproductive health challenges.

Peer counselling had a positive effect on acceptance of modern contraceptives. Participants who received peer counselling were more likely to accept a method than those who received routine counselling. More likely to accept a method were participants whose partners had attained more than secondary education compared to those whose partners had less education.

Adherence to modern contraceptives was generally low, with less than half adhering by the sixth month. This left many participants at a high risk of unplanned pregnancy. The commonest reasons for non-adherence were side effects and partner prohibition. Participants who were using LARC methods were more likely to adhere than those who were using SARC methods.

Use of contraceptives among the respondents was influenced by peers, partners and parents/guardians, and institutions like schools and health care. These either supported, discouraged or prohibited use of contraceptives. Support, discouragement and prohibition were reflective of the established social norms. Support and encouragement were mainly given to married and multiparous adolescents based on the benefits of contraceptives in child spacing. Discouragement and prohibition were a result of contraceptive misconceptions that were intertwined with traditional social norms, that adolescents should not be involved in pre-marital sexual activity.

Schools and health care institutions' role was to provide contraceptive information and to dispell misconceptions. Information obtained from these institutions was highly regarded, to the extent that respondents who had been discouraged or prohibited by peers, partners and parents/guardians, went ahead and used the contraceptives, sometimes clandestinely. This is so because the information they received at the institutions gave them assurance that the benefits of using contraceptives outweighed the risks of non-use.

10 POINTS OF PERSPECTIVE

The information obtained from this thesis could be used to inform decision making towards increasing contraceptive use among refugee adolescents. In the long run, this will help to reduce adolescent pregnancy and associated complications especially in the humanitarian setting. This will play an important role towards the achievement of the Sustainable Development Goals (SDGs) 3 and 5, to ensure healthy lives and promote well-being for all at all ages, and to achieve gender equality and empower all women and girls respectively. Below are the recommendations from this study:

10.1 FOR POLICY AND PRACTICE

There is need to improve refugee adolescents' access to high quality sexual and reproductive health care thereby increasing knowledge dissemination on contraceptive use, addressing the fear of side effects, improving availability of contraceptive methods and services, and providing more adolescent friendly contraceptive counselling techniques.

Peer counselling has proven effective in increasing acceptance of modern contraceptives among female refugee adolescents. It should therefore be rolled out in health centres and other places that provide contraceptive services. This will in the long run help to reduce unwanted adolescent pregnancies and associated complications.

LARC methods are easier to adhere to than SARC methods. Therefore, they should be made more available especially for refugee adolescents. Further sensitization of the public including health care workers and adolescents should be done regarding the effectiveness and ease of use of LARC methods, so as to increase the use of these methods.

Peers, partners and parents/guardians of refugee adolescents should be further sensitized of the dangers of adolescent pregnancy, and the importance of contraception in preventing these pregnancies. This is so because of the key role they play in influencing adolescent decision making especially with regards to their sexual and reproductive health.

Schools and health care institutions play an important role in providing contraceptive information to adolescents. We recommend that they are strengthened to better provide this information on an even larger scale, not only to adolescents, but also within the community. This should be done with an aim of dispelling misconceptions and reducing contraceptive stigma in the community.

10.2 FOR RESEARCH

Interventions that will address the challenge of gender-power imbalances especially among refugee adolescents should be further studied and implemented. This will help to shape decision making among adolescents, and enable them to make their own decisions especially with regards to their SRHR.

There is need for more research that involves partners of adolescents, so as to better understand the importance of partner support and their role in contraceptive decision making especially among refugee adolescents.

Further studies are necessary to examine the cost effectiveness and feasibility of peer counselling, so that it can be rolled out to increase contraceptive use among female refugee adolescents.

Peers, partners and parents/guardians play a very important role in adolescent contraceptive decision making. Future research aimed at increasing adolescent contraceptive use should aim at engaging these persons so as to better understand their stance and how they can help improve adolescents' lives with regards to their SRHR.

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12 REFERENCES

1. UNICEF. Early Childbearing 2021 [Available from: <https://data.unicef.org/topic/child-health/adolescent-health/>].
2. UN DESA SD. SDG Indicators: Global Database. New York: UN DESA 2017 [Available from: <https://unstats.un.org/sdgs/unsdg>].
3. WHO. Adolescent Pregnancy 2020 [Available from: <https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy>].
4. Darroch J, Woog V, Bankole A, Ashford L. Adding it up: Costs and benefits of meeting the contraceptive needs of adolescents. New York: Guttmacher Institute. 2016.
5. UNFPA. Adolescent pregnancy 2017 [Available from: <https://www.unfpa.org/adolescent-pregnancy>].
6. UDHS. Uganda Demographic and Health Survey 2016 [Available from: <https://dhsprogram.com/pubs/pdf/FR333/FR333.pdf>].
7. WorldBank. Economic impacts of child marriage: Global synthesis report. Washington, DC 2017 [Available from: <https://documents1.worldbank.org/curated/en/530891498511398503/pdf/116829-WP-P151842-PUBLIC-EICM-Global-Conference-Edition-June-27.pdf>].
8. UNFPA. Marrying Too Young End Child Marriage. New York, NY: United Nations Population Fund 2012 [Available from: <http://www.unfpa.org/sites/default/files/pub-pdf/MarryingTooYoung.pdf>].
9. Blumenberg C, Hellwig F, Ewerling F, Barros AJD. Socio-demographic and economic inequalities in modern contraception in 11 low- and middle-income countries: an analysis of the PMA2020 surveys. *Reproductive Health*. 2020;17(1):82.
10. Sserwanja Q, Musaba MW, Mukunya D. Prevalence and factors associated with modern contraceptives utilization among female adolescents in Uganda. *BMC Women's Health*. 2021;21(1):61.
11. Casey S, Gallagher M, Kakesa J, Kalyanpur A, Muselemu J-B, Rafanoharana R, et al. . Contraceptive use among adolescent and young women in North and South Kivu, Democratic Republic of the Congo: A cross-sectional population-based survey. *PLoS Med*. 2020;17(3).
12. Me G, Morgan GT, Benevides R, Fikree FF, editors. Literature review: Reaching young first-time parents for the healthy spacing of second and subsequent pregnancies2014.
13. Warenius LU, Faxelid EA, Chishimba PN, Musandu JO, Ong'any AA, Nissen EBM. Nurse-Midwives' Attitudes towards Adolescent Sexual and Reproductive Health Needs in Kenya and Zambia. *Reproductive Health Matters*. 2006;14(27):119-28.
14. Eke AC, Alabi-Isama L. Long-acting reversible contraception (LARC) use among adolescent females in secondary institutions in Nnewi, Nigeria. *Journal of Obstetrics and Gynaecology*. 2011;31(2):164-8.

15. FP2020. Contraceptive discontinuation: reasons, callenges and solutions 2015 [Available from: <https://fp2030.org/resources/contraceptive-discontinuation-reasons-challenges-and-solutions>.
16. Boamah E, Asante KP., Mahama E, Manu G, Ayipah E, Adeniji E, et al. Use of contraceptives among adolescents in Kintampo, Ghana: a cross-sectional study. *Open Access J Contracept*. 2014;5:7-15.
17. Blanc A, Tsui A, Croft T, Trevitt J. Patterns and trends in adolescents' contraceptive use and discontinuation in developing countries and comparisons with adult women 2009 [Available from: https://www.guttmacher.org/sites/default/files/article_files/3506309.pdf.
18. Ontiri S, Mutea L, Naanyu V, Kabue M, Biesma R, Stekelenburg J. A qualitative exploration of contraceptive use and discontinuation among women with an unmet need for modern contraception in Kenya. *Reprod Health*. 2021;18(1):33.
19. Kibira S, Muhumuza C, Bukonya J, Atuyambe L. "I Spent a Full Month Bleeding, I Thought I Was Going to Die..." A Qualitative Study of Experiences of Women Using Modern Contraception in Wakiso District, Uganda. *PLoS One*. 2015;10(11).
20. Ataullahjan A, Vallianatos H, Mumtaz Z. Needles Don't Agree with Me, Pills Don't Agree with Me: Experiences of Contraceptive Use among Pakhtun Women in Pakistan. *Studies in family planning*. 2020;51(4):361-75.
21. Nara R, Banura A, Foster AM. Assessing the availability and accessibility of emergency contraceptive pills in Uganda: A multi-methods study with Congolese refugees. *Contraception*. 2020;101(2):112-6.
22. Okanlawon K, Reeves M, Agbaje OF. Contraceptive Use: Knowledge, Perceptions and Attitudes of Refugee Youths in Oru Refugee Camp, Nigeria. *African Journal of Reproductive Health / La Revue Africaine de la Santé Reproductive*. 2010;14(4):16-25.
23. Tanabe M, Myers A, Bhandari P, Cornier N, Doraiswamy S, Krause S. Family planning in refugee settings: findings and actions from a multi-country study. *Conflict and Health*. 2017;11(1):9.
24. Azevedo WFd, Diniz MB, Fonseca ESVBd, Azevedo LMRd, Evangelista CB. Complications in adolescent pregnancy: systematic review of the literature. *Einstein (São Paulo)*. 2015;13:618-26.
25. WHO. Global health estimates 2015: deaths by cause, age, sex, by country and by region, 2000–2015. Geneva: WHO 2016 [Available from: <https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghel-leading-causes-of-death>.
26. WHO. Adolescent pregnancy 2020 [Available from: <https://www.who.int/en/news-room/fact-sheets/detail/adolescent-pregnancy>.
27. Zhang T, Wang H, Wang X, Yang Y, Zhang Y, Tang Z, et al. The adverse maternal and perinatal outcomes of adolescent pregnancy: a cross sectional study in Hebei, China. *BMC Pregnancy and Childbirth*. 2020;20(1):339.
28. Tembo T, Koyuncu A, Zhuo H, Mwendafilumba M, Manasyan A. The association of maternal age with adverse neonatal outcomes in Lusaka, Zambia: a prospective cohort study. *BMC Pregnancy and Childbirth*. 2020;20(1):684.

29. Rexhepi M, Besimi F, Rufati N, Alili A, Bajrami S, Ismaili H. Hospital-Based Study of Maternal, Perinatal and Neonatal Outcomes in Adolescent Pregnancy Compared to Adult Women Pregnancy. *Open Access Maced J Med Sci.* 2019;7(5):760-6.
30. Kassa G, Arowojolu A, Odukogbe A, Yalew A. Adverse neonatal outcomes of adolescent pregnancy in Northwest Ethiopia. *PLoS ONE.* 2019;14(6).
31. Yussif A-S, Lassey A, Ganyaglo GY-k, Kantelhardt EJ, Kielstein H. The long-term effects of adolescent pregnancies in a community in Northern Ghana on subsequent pregnancies and births of the young mothers. *Reproductive Health.* 2017;14(1):178.
32. Atuyambe L, Mirembe F, Johansson A, Kirumira EK, Faxelid E. Experiences of pregnant adolescents--voices from Wakiso district, Uganda. *African health sciences.* 2005;5(4):304-9.
33. WHO. Global standards for quality health-care services for adolescents: a guide to implement a standards-driven approach to improve the quality of health care services for adolescents 2015 [Available from: <https://apps.who.int/iris/handle/10665/183935>].
34. Osok J, Kigamwa P, Stoep AV, Huang K-Y, Kumar M. Depression and its psychosocial risk factors in pregnant Kenyan adolescents: a cross-sectional study in a community health Centre of Nairobi. *BMC Psychiatry.* 2018;18(1):136.
35. WHO. WHO Contraceptive counselling and compliance 2007 [Available from: <https://apps.who.int/iris/handle/10665/269874>].
36. WHO. Family planning - A global handbook for providers 2018 [Available from: <https://www.who.int/reproductivehealth/publications/fp-global-handbook/en/>].
37. Saldanha N. Use of Short Acting Reversible Contraception in Adolescents: The Pill, Patch, Ring and Emergency Contraception. *Current Problems in Pediatric and Adolescent Health Care.* 2018;48(12):333-44.
38. Burns M, Mulligan J, Harvey M, Patterson A, Nahmias P, Chapman K, et al. Improving Reproductive, Maternal and Newborn Health: Reducing Unintended Pregnancies. Evidence Overview. A Working Paper (Version 1.0). 2010.
39. USAID. Essential components of family planning benefits packages 2017 [Available from: http://www.healthpolicyplus.com/ns/pubs/7178-7318_FPUHC.pdf].
40. Lemani C, Tang J, Kopp D, Phiri B, Kumvula C, Chikosi L, et al. Contraceptive uptake after training community health workers in couples counseling: A cluster randomized trial. *PLoS ONE* 2017;12(4).
41. Potter J, Santelli JS. Contraceptive Counseling for Adolescents. *Women's Health.* 2015;11(6):737-41.
42. Usynina AA, Postoev V, Odland JØ, Grjibovski AM. Adverse Pregnancy Outcomes among Adolescents in Northwest Russia: A Population Registry-Based Study. *Int J Environ Res Public Health.* 2018;15(2):261.
43. Oringanje C, Meremikwu MM, Eko H, Esu E, Meremikwu A, Ehiri JE. Interventions for preventing unintended pregnancies among adolescents. *Cochrane Database of Systematic Reviews.* 2016(2).
44. Wilson SF, Degaiffier N, Ratcliffe SJ, Schreiber CA. Peer counselling for the promotion of long-acting, reversible contraception among teens: a randomised, controlled trial. *Eur J Contracept Reprod Health Care.* 2016;21(5):380-7.

45. Mevsim V, Guldal D, Gunvar T, Saygin O, Kuruoglu E. Young people benefit from comprehensive education on reproductive health. *The European Journal of Contraception & Reproductive Health Care*. 2009;14(2):144-52.
46. Taylor M, Jinabhai C, Dlamini S, Sathiparsad R, Eggers MS, De Vries H. Effects of a Teenage Pregnancy Prevention Program in KwaZulu-Natal, South Africa. *Health Care for Women International*. 2014;35(7-9):845-58.
47. Albert D, Chein J, Steinberg L. Peer Influences on Adolescent Decision Making. *Curr Dir Psychol Sci*. 2013;22(2):114-20.
48. Brown BB, Larson J. Peer Relationships in Adolescence. *Handbook of Adolescent Psychology* 2009.
49. MoH. National Adolescent Health Policy for Uganda, Kampala: Republic of Uganda. 2004.
50. MoH. Adolescent Health Policy Guidelines and Service Standards 2012 [Available from: <http://library.health.go.ug/publications/adolescent-health/adolescent-health-policy-guidelines-and-service-standards>].
51. WHO. Improving family planning service delivery in humanitarian crises 2017 [Available from: https://www.who.int/reproductivehealth/publications/family_planning/family-planning-humanitarian-crisis/en/].
52. Hubacher D, Trussell J. A definition of modern contraceptive methods. *Contraception*. 2015;92(5):420-1.
53. WHO. Contraceptive prevalence 2022 [Available from: <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/5>].
54. UNHCR. Baseline Study: Documenting Knowledge, Attitudes and Practices of Refugees and the Status of Family Planning Services in UNHCR's Operations in Nakivale Refugee Settlement, Uganda 2011 [Available from: <https://www.unhcr.org/protection/health/4e8c0da49/baseline-study-documenting-knowledge-attitudes-practices-refugees-status.html>].
55. Ganle JK, Amoako D, Baatiema L, Ibrahim M. Risky sexual behaviour and contraceptive use in contexts of displacement: insights from a cross-sectional survey of female adolescent refugees in Ghana. *International journal for equity in health*. 2019;18(1):127.
56. Trussell J. Contraceptive efficacy. *Glob libr women's med*. 2014.
57. Cooper D, Mahdy H. Oral Contraceptive Pills. [Updated 2021 Dec 16] StatPearls Publishing 2021.
58. WHO. Sexual and reproductive health 2022 [Available from: https://www.who.int/reproductivehealth/topics/family_planning/condoms-safety/en/].
59. MoH. Family planning 2020 (<http://www.familyplanning2020.org/entities/80>). 2014.
60. WHO. Family planning/Contraception methods 2020 [Available from: <https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception>].
61. UNFPA. Long-acting reversible contraception (LARC) 2021 [Available from: <https://www.unfpa.org/sites/default/files/resource-pdf/larcs-unfpa-2021.pdf>].

62. FP2030. Global consensus statement for expanding contraceptive choice for adolescents and youth to include long-acting reversible contraception 2015 [Available from: <https://fp2030.org/sites/default/files/Global%20Consensus%20Statement%20-%20Expanding%20Contraceptive%20Choice.pdf>].
63. FP2030. Long-acting-reversible-contraceptives-larcs 2016 [Available from: <https://fp2030.org/resources/long-acting-reversible-contraceptives-larcs>].
64. Ott MA, Sucato GS. Contraception for adolescents. *Pediatrics*. 2014;134(4):e1257–e81.
65. ACOG. Committee on Adolescent Health Care, Long-Acting Reversible Contraception Working Group, Committee opinion no. 539: adolescents and longacting reversible contraception: implants and intrauterine devices. *Obstetrics & Gynecology*. 2012;120(4):983-8.
66. Todd N, Black A. Contraception for Adolescents. *J Clin Res Pediatr Endocrinol*. 2020;12(Suppl 1):28-40.
67. Nyarko S. Prevalence and correlates of contraceptive use among female adolescents in Ghana. *BMC Women's Health* 2015;16(60).
68. Chola M, Hlongwana K, Ginindza TG. Patterns, trends, and factors associated with contraceptive use among adolescent girls in Zambia (1996 to 2014): a multilevel analysis. *BMC Women's Health*. 2020;20(1):185.
69. de Vargas Nunes Coll C, Ewerling F, Hellwig F, de Barros AJD. Contraception in adolescence: the influence of parity and marital status on contraceptive use in 73 low-and middle-income countries. *Reproductive health*. 2019;16(1):21.
70. Lule H, Echoru I, Nnabagulanyi M, Mulumba R. Determinants of contraceptive utilisation amongst teenage mothers: a case control study in kyangwali refugee settlement (Uganda)2015. 243-57 p.
71. Potter J, Santelli JS. Contraceptive counseling for adolescents. *Women's health (London, England)*. 2015;11(6):737-41.
72. Jaccard J, Levitz N. Counseling adolescents about contraception: towards the development of an evidence-based protocol for contraceptive counselors. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*. 2013;52(4 Suppl):S6-13.
73. Ali M, Tran NT. Defining counselling in contraceptive information and services: outcomes from an expert think tank. *BMJ Sexual & Reproductive Health*. 2021:bmjsrh-2021-201132.
74. Madden T, Mullersman JL, Omvig KJ, Secura GM, Peipert JF. Structured contraceptive counseling provided by the Contraceptive CHOICE Project. *Contraception*. 2013;88(2):243-9.
75. Raidoo S, Kaneshiro B. Contraception counseling for adolescents. *Current opinion in obstetrics & gynecology*. 2017;29(5):310-5.
76. Chandra-Mouli V, Akwara E. Improving access to and use of contraception by adolescents: What progress has been made, what lessons have been learnt, and what are the implications for action? *Best Pract Res Clin Obstet Gynaecol*. 2020;66:107-18.

77. Landolt NK, Achalapong J, Kosalaraksa P, Petdachai W, Ngampiyaskul C, Kerr S, et al. Strategies to improve the uptake of effective contraception in perinatally HIV-infected adolescents. *J Virus Erad.* 2017;3(3):152-6.
78. Chandra-Mouli V, McCarraher DR, Phillips SJ, Williamson NE, Hainsworth G. Contraception for adolescents in low and middle income countries: needs, barriers, and access. *Reproductive Health.* 2014;11(1):1.
79. Bett JC. The importance of promoting the value of the role of Peer counselling among Students in secondary schools. *The international journal of Economy, Management and Social Sciences.* 2013;2(6):477-84.
80. Stephenson J, Strange V, Allen E, Copas A, Johnson A, Bonell C, et al. The Long-Term Effects of a Peer-Led Sex Education Programme (RIPPLE): A Cluster Randomised Trial in Schools in England. *PLoS medicine.* 2008;5(11):e224.
81. Jay MS, R.H. DuRant, and I.F. Litt. Female adolescents' compliance with contraceptive regimens. *Pediatr Clin North Am.* 1989;36:731-46.
82. Lara-Torre E, Schroeder B. Adolescent compliance and side effects with Quick Start initiation of oral contraceptive pills. *Contraception.* 2002;66(2):81-5.
83. Diserens C, Quach A, Mathevet P, Ballabeni P, Jacot-Guillarmod M. Adolescents' contraception continuation in Switzerland: a prospective observational study. *Swiss Med Wkly.* 2017;147:w14504.
84. Clare C, Fraser C. Contraception Adherence among East Harlem Adolescents. *Gynecol Obstet.* 2013;3(177).
85. Raine T, Foster-Rosales A, Upadhyay UD, Boyer C, Brown BA, Sokoloff A, et al. One-Year Contraceptive Continuation and Pregnancy in Adolescent Girls and Women Initiating Hormonal Contraceptives. *Obstetrics & Gynecology.* 2011;117:363-71.
86. Muhindo R, Nankumbi OJ, Sara Groves., Michelene C. Predictors of Contraceptive Adherence among Women Seeking Family Planning Services at Reproductive Health Uganda, Mityana Branch. *International Journal of Population Research.* 2015;10.
87. Usinger KM, Gola SB, Weis M, Smaldone A. Intrauterine Contraception Continuation in Adolescents and Young Women: A Systematic Review. *Journal of Pediatric and Adolescent Gynecology.* 2016;29(6):659-67.
88. Ivanova O, Rai M, Kemigisha E. A Systematic Review of Sexual and Reproductive Health Knowledge, Experiences and Access to Services among Refugee, Migrant and Displaced Girls and Young Women in Africa. *International journal of environmental research and public health.* 2018;15(8).
89. Harrington E, Casmir E, Kithao P, Kinuthia J, John-Stewart G, Drake A, et al. "Spoiled" girls: Understanding social influences on adolescent contraceptive decision-making in Kenya. *PLoS ONE.* 2021;16(8).
90. Bangoura C, Dioubaté N, Manet H, Camara BS, Kouyaté M, Douno M, et al. Experiences, Preferences, and Needs of Adolescents and Urban Youth in Contraceptive Use in Conakry, 2019, Guinea. *Frontiers in Global Women's Health.* 2021;2.
91. Eisen M, Zellman G, , McAlister A. A Health Belief Model Approach to Adolescents' Fertility Control: Some Pilot Program Findings. *Health Education Quarterly.* 1985;12(2):185-210.

92. Rogers Gillmore M, Archibald M, Morrison D, Wilsdon A, Wells E, Hoppe M, et al. Teen Sexual Behavior: Applicability of the Theory of Reasoned Action. *Journal of Marriage and Family*. 2002;64:885-97.
93. Ajzen I, Fishbein M. *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall. 1980.
94. Janz NK, Becker MH. The Health Belief Model: A Decade Later. *Health Education & Behavior*. 1984;11(1):1-47.
95. UNHCR. Refugee statistics 2021 [Available from: <https://www.unhcr.org/refugee-statistics/>].
96. UNHCR. Uganda-Refugee Statistics December 2021 2021 [Available from: <https://data2.unhcr.org/en/documents/details/90649>].
97. UNHCR. Annual Public Health Global Review 2019 [Available from: <https://www.unhcr.org/606f10d04.pdf>].
98. UNHCR. Comprehensive refugee response framework Uganda, The way forward 2017 [Available from: <https://data2.unhcr.org/en/documents/details/63266>].
99. The Refugees Act. Uganda: The Refugee Act 2006 [Uganda], Act 21 2006.
100. UNHCR. Uganda - Refugee Statistics December 2021 - Palabek. 2021.
101. Corbin J, Strauss A. *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Sage publications. 2014.
102. WHO. *A guide to family planning for community health workers and their clients 2012* [Available from: <https://apps.who.int/iris/handle/10665/44882>].
103. Durant RH, Jay MS, Linder CW, Shoffitt T, Litt I. Influence of psychosocial factors on adolescent compliance with oral contraceptives. *Journal of Adolescent Health Care*. 1984;5(1):1-6.
104. Braun VC, V. *Using thematic analysis in psychology*. *Qualitative Research in Psychology* 2006.
105. MoH. *The National Policy Guidelines and Service Standards for Sexual and Reproductive Health and Rights, Uganda 2006*:Pg 19-20.
106. UNWOMEN. *Gender power inequalities 2020* [Available from: <https://www.endvawnow.org/es/articles/1930-gendered-power-inequalities-.html>].
107. Wingood GM, Scd, DiClemente RJ. Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health education & behavior : the official publication of the Society for Public Health Education*. 2000;27(5):539-65.
108. Guttmacher-Institute. *ADDING IT UP: Investing in Contraception and Maternal and Newborn Health for Adolescents in Uganda, 2018 2018* [Available from: <https://www.guttmacher.org/sites/default/files/factsheet/adding-it-up-contraception-mnh-adolescents-uganda.pdf>].
109. Guttmacher-Institute. *Access to Contraceptive Services Among Adolescents in Uganda During the COVID-19 Pandemic 2021* [Available from: <https://www.guttmacher.org/report/impact-covid-19-on-adolescent-srh-uganda>].

110. WHO. Uganda Contraception within the context of adolescents' sexual and reproductive lives: Country profile 2020 [Available from: <https://apps.who.int/iris/bitstream/handle/10665/339537/WHO-SRH-20.26-eng.pdf>].
111. UNHCR. Baseline Study: Documenting Knowledge, Attitudes and Practices of Refugees and the Status of Family Planning Services in UNHCR's Operations in Nakivale Refugee Settlement, Uganda. 2011.
112. Ivanova O, Rai M, Mlahagwa W, Tumuhairwe J, Bakuli A, Nyakato VN, et al. A cross-sectional mixed-methods study of sexual and reproductive health knowledge, experiences and access to services among refugee adolescent girls in the Nakivale refugee settlement, Uganda. *Reproductive Health*. 2019;16(1):35.
113. Islam M, Khan N, Rahman M. Factors affecting child marriage and contraceptive use among Rohingya girls in refugee camps. *The Lancet Regional Health - Western Pacific*. 2021.
114. Ochako R, Mbondo M, Aloo S, Kaimenyi S, Thompson R, Temmerman M, et al. Barriers to modern contraceptive methods uptake among young women in Kenya: a qualitative study. *BMC Public Health*. 2015;15(1):118.
115. Manlove JS, Ryan S, Franzetta K. Patterns of Contraceptive Use Within Teenagers' First Sexual Relationships. 2003.
116. Bauermeister JA, Zimmerman M, Xue Y, Gee GC, Caldwell CH. Working, sex partner age differences, and sexual behavior among African American youth. *Arch Sex Behav*. 2009;38(5):802-13.
117. Madiba S, Ngwenya N. Cultural practices, gender inequality and inconsistent condom use increase vulnerability to HIV infection: narratives from married and cohabiting women in rural communities in Mpumalanga province, South Africa. *Glob Health Action*. 2017;10(sup2):1341597-.
118. Kriel Y, Milford C, Cordero J, Suleman F, Beksinska M, Steyn P, et al. Male partner influence on family planning and contraceptive use: perspectives from community members and healthcare providers in KwaZulu-Natal, South Africa. *Reproductive Health*. 2019;16(1):89.
119. Balogun O, Adeniran A, Fawole A, Adesina K, Aboyeji A, Adeniran P. Effect of Male Partner's Support on Spousal Modern Contraception in a Low Resource Setting. *Ethiop J Health Sci*. 2016;26(5):439-48.
120. Kabagenyi A, Jennings L, Reid A, Nalwadda G, Ntozi J, Atuyambe L. Barriers to male involvement in contraceptive uptake and reproductive health services: a qualitative study of men and women's perceptions in two rural districts in Uganda. *Reproductive Health*. 2014;11(1):21.
121. Ciranka S, van den Bos W. Social Influence in Adolescent Decision-Making: A Formal Framework. *Frontiers in Psychology*. 2019;10(1915).
122. Dehingia N, Barker KM, Raj A. Relationship between adolescent friendship networks and contraceptive use and unintended pregnancies in early adulthood in the United States. *Contraception*. 2022.
123. Gubhaju B. The Influence of Wives' and Husbands' Education Levels On Contraceptive Method Choice in Nepal, 1996-2006. *International Perspectives on Sexual and Reproductive Health*. 2009;35(4).

124. Wondim G, Degu G, Teka Y, Diress G. Male Involvement in Family Planning Utilization and Associated Factors in Womberma District, Northern Ethiopia: Community-Based Cross-Sectional Study. *Open Access J Contracept.* 2020;11:197-207.
125. Ijadunola MY, Abiona TC, Ijadunola KT, Afolabi OT, Esimai OA, OlaOlorun FM. Male involvement in family planning decision making in Ile-Ife, Osun State, Nigeria. *African journal of reproductive health.* 2010;14(4 Spec no.):43-50.
126. Egbe To, Ketchen S, Egbe E-N, Halle-Ekane G, Belley-Priso E. Risk Factors and Barriers to Male Involvement in the Choice of Family Planning Methods in the Buea Health District, South West Region, Cameroon: A Cross-Sectional Study in a Semi-Urban Area. *Women's Health - Open Journal.* 2016;1:82-90.
127. Cavallaro FL, Benova L, Owolabi OO, Ali M. A systematic review of the effectiveness of counselling strategies for modern contraceptive methods: what works and what doesn't? *BMJ Sexual & Reproductive Health.* 2019;bmjsrh-2019-200377.
128. Sarnak D, Wood S, Zimmerman L, Karp C, Makumbi F, Kibira S, et al. The role of partner influence in contraceptive adoption, discontinuation, and switching in a nationally representative cohort of Ugandan women. *PLoS ONE.* 2021;16(1).
129. Ouédraogo AM, Baguuya A, Compaoré R, Cissé K, Dahourou DL, Somé A, et al. Predictors of contraceptive method discontinuation among adolescent and young women in three West African countries (Burkina Faso, Mali, and Niger). *BMC Women's Health.* 2021;21(1):261.
130. Maslyanskaya S, Coupey SM, Chhabra R, Khan UI. Predictors of Early Discontinuation of Effective Contraception by Teens at High Risk of Pregnancy. *Journal of pediatric and adolescent gynecology.* 2016;29(3):269-75.
131. Jensen JTC, Mitchell D. Speroff & Darney's Clinical Guide to Contraception. 6th Edition ed2019.
132. Stoddard A, McNicholas C, Peipert JF. Efficacy and safety of long-acting reversible contraception. *Drugs.* 2011;71(8):969-80.
133. Secura GM, Allsworth JE, Madden T, Mullersman JL, Peipert JF. The Contraceptive CHOICE Project: reducing barriers to long-acting reversible contraception. *Am J Obstet Gynecol.* 2010;203(2):115.e1-e1157.
134. Lipetz C, Fleming C, Phillips C. Actual cost of providing long-acting reversible contraception: a study of Implanon® cost. *Journal of Family Planning and Reproductive Health Care.* 2009;35(2):75-9.
135. Secura G, Allsworth J, Madden T et al. The Contraceptive CHOICE Project: reducing barriers to long-acting reversible contraception. *Am J Obstet Gynecol.* 2010.
136. Tibaijuka L, Odongo R, Welikhe E, Mukisa W, Kugonza L, Busingye I, et al. Factors influencing use of long-acting versus short-acting contraceptive methods among reproductive-age women in a resource-limited setting. *BMC Women's Health.* 2017;17(1):25.
137. Bakesiima R, Beyeza-Kashesya, J., Tumwine, JK., Chalo, RN., Gemzell-Danielsson, K., Cleeve, A., et al Effect of peer counselling on acceptance of modern contraceptives among female refugee adolescents in northern Uganda: A randomised controlled trial. *PLoS One.* 2021;16(9).

138. Sanchez EK, Speizer IS, Tolley E, Calhoun LM, Barrington C, Olumide AO. Influences on seeking a contraceptive method among adolescent women in three cities in Nigeria. *Reproductive Health*. 2020;17(1):167.
139. Potard C, Courtois R, Rusch E. The influence of peers on risky sexual behaviour during adolescence. *The European Journal of Contraception & Reproductive Health Care*. 2008;13(3):264-70.
140. Cherri Z, Gil Cuesta J, Rodriguez-Llanes JM, Guha-Sapir D. Early Marriage and Barriers to Contraception among Syrian Refugee Women in Lebanon: A Qualitative Study. *International journal of environmental research and public health*. 2017;14(8).
141. Lewis DA, Martins SL, Gilliam ML. Partner roles in contraceptive use: what do adolescent mothers say? *Journal of pediatric and adolescent gynecology*. 2012;25(6):396-400.
142. Hoopes AJ, Gilmore K, Cady J, Akers AY, Ahrens KR. A Qualitative Study of Factors That Influence Contraceptive Choice among Adolescent School-Based Health Center Patients. *J Pediatr Adolesc Gynecol*. 2016;29(3):259-64.
143. Dombola GM, Manda WC, Chipeta E. Factors influencing contraceptive decision making and use among young adolescents in urban Lilongwe, Malawi: a qualitative study. *Reproductive Health*. 2021;18(1):209.
144. Gee S, Vargas J, Foster AM. "The more children you have, the more praise you get from the community": exploring the role of sociocultural context and perceptions of care on maternal and newborn health among Somali refugees in UNHCR supported camps in Kenya. *Conflict and Health*. 2019;13(1):11.
145. Kisindja RM, Kimona C, Etoy M, Dorme F, Benfield N. Family planning knowledge and use among women in camps for internally displaced people in the Democratic Republic of the Congo. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. 2017;138(3):256-60.
146. Mulubwa C, Munakampe MN, Namakula H, Hernandez A, Ssekamatte T, Atuyambe LM, et al. Framing Contraceptive Use Motivations Among Adolescents and Young Adults Living in Informal Settlements in Kira Municipality, Wakiso District, Uganda. *Frontiers in Global Women's Health*. 2021;2.
147. Maheen H, Chalmers K, Khaw S, McMichael C. Sexual and reproductive health service utilisation of adolescents and young people from migrant and refugee backgrounds in high-income settings: a qualitative evidence synthesis (QES). *Sexual health*. 2021;18(4):283-93.
148. Clare C, Squire MB, Alvarez K, Meisler J, Fraser C. Barriers to adolescent contraception use and adherence. *International journal of adolescent medicine and health*. 2016;30(4).
149. Latkin CA, Edwards C, Davey-Rothwell MA, Tobin KE. The relationship between social desirability bias and self-reports of health, substance use, and social network factors among urban substance users in Baltimore, Maryland. *Addict Behav*. 2017;73:133-6.
150. Nunan D, Aronson J, Bankhead C. Catalogue of bias: attrition bias. *BMJ evidence-based medicine*. 2018;23(1):21-2.

