PREVALENCE AND FACTORS ASSOCIATED WITH EMERGENCY CONTRACEPTIVE USE AMONG FEMALE STUDENTS OF GULU UNIVERSITY.

BY

MUKEMBO ROBERT

21/U/3114/MPH/PS

SUPERVISORS:

DR. ALARAKOL SIMON PETER, PhD.

DR. LAKER FLORENCE, MPH-PRH

A DISSERTATION SUBMITTED TO DIRECTORATE OF RESEARCH AND GRADUATE TRAINING IN PARTIAL FULFILMENT FOR THE AWARD OF A MASTER'S DEGREE OF PUBLIC HEALTH OF GULU UNIVERSITY.

November 2025.

DECLARATION

I declare to the best of my knowledge that the information contained in this research report titled "Prevalence and Factors Associated with Emergency Contraceptive use among Female Students of Gulu University." is original and not copied from any other source except where due reference or acknowledgement is made in the text.

Sign: ..... Date: 17th. November. 2025.....

Mukembo Robert

21/U/3114/MPH/PS

APPROVAL

I confirm that this research report has been written under my guidance and supervision.

SUPERVISOR 1

Signature: ..... Date.....17/11/2025.....

Dr. Alarakol Simon Peter, BBLT, MSc.Mol. Bio, Dip.Sc. Tech Chem/Biochem, PhD.

Senior Lecturer, Faculty of Medicine, Gulu University.

SUPERVISOR 2

Signature: ..... Date.....17/11/25.....

Dr. Laker Florence, MBChB, MPH-PRH.

Lecturer, Faculty of Medicine, Gulu University.

DEDICATION

This research is dedicated to my beloved Parents, especially my father- the late Mr. Mulumba Patrick (RIP), for their incredible contribution towards my academic career development.

ACKNOWLEDGEMENT

The development of this report was a result of great efforts, teamwork, and commitment from different stakeholders. Therefore, I would like to extend my sincere gratitude to the work and efforts of my supervisors and my lecturers for guiding me through the process of research and master's degree studies.

I further acknowledge all the study participants and research assistants for their valuable time and support in completing the study.

I appreciate Gulu University management, through Building Stronger Universities (BSU IV) masters research completion grant, for the support and administrative approval for conducting the study.

Table of contents

DECLARATION ii
APPROVAL iii
DEDICATION iv
ACKNOWLEDGEMENT v
Table of contents vi
LIST OF ABBREVIATIONS ix
LIST OF FIGURES x
LIST OF TABLES xi
OPERATIONAL DEFINITIONS: xii
ABSTRACT xiii
Background. xiii
Methodology. xiii
Results xiii
Conclusion. xiii
CHAPTER ONE: 1
1.0 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 Statement of the problem. 4
1.3 Study justification. 5
1.4. Study Significance 6
1.5 Research Questions 7
1.6 Study objectives. 7
1.6.1 General objectives. 7
1.6.2 Specific objectives: 8
1.7 Scope of study 8
1.8 CONCEPTUAL FRAMEWORK 9
CHAPTER TWO: LITERATURE REVIEW 11
2.1 Introduction 11
2.2 Overview: General Emergency Contraception and Practice 11
2.3 Prevalence of Emergency Contraceptive Use. 12
2.4 Factors Associated with use of EC 13
2.4.1 Socio-demographic factors 13
2.4.2 Health system factors 14

2.4.3 Individual factors 16
CONCLUSION 17
CHAPTER THREE: METHODS 20
3.1 Study Design 20
3.2 Study area 20
3.3 Study population: 20
3.3.1 Target population 21
3.3.2 Accessible population 21
3.4 Selection criteria 21
3.4.1 Inclusion criteria: 21
3.4.2 Exclusion criteria: 21
3.5 Sample size estimation 21
3.6 Sampling procedure 22
3.7 Study variables 23
3.7.1 Independent variables: 23
3.7.2 Dependent variable: 23
3.8 Data collection procedure 23
3.9 Data management 23
3.11 Quality control 24
3.13 Ethical considerations 24
3.14 Dissemination of results 25
3.15 Covid 19 mitigation 25
3.17 Community engagements 25
CHAPTER FOUR: 27
4.1 Socio-demographic Characteristics of Female Students of Gulu University 27
4.2 Prevalence of Emergency Contraceptive use among Female Students of Gulu University. 28
4.2.1 EC use across selected sociodemographic characteristics of the students. 28
4.3 Factors associated with Emergency Contraceptive use. 29
4.3.1 Individual Factors 29
4.3.1.1 Sexual and Reproductive Characteristics of Female Students of Gulu University 29

4.3.1.2 Knowledge and attitudes towards Emergency Contraceptive use 30
4.3.1.3 Attitude towards Emergency Contraceptive use 32
4.4 Reason for Not Using Emergency Contraception 32
4.5 Sources of information on emergency contraceptive. 33
4.6 Factors Significantly Associated with Emergency Contraceptive use. [Tables 6 & 7 below]. 34
4.6.1 Year of Study 34
4.6.2 Previous Use of Regular Contraceptives 34
CHAPTER FIVE: DISCUSSION 37
5.1 Introduction 37
5.2 Prevalence of emergency contraceptive use 37
5.3 Factors associated with emergency contraceptive use 38
5.4 Strengths and limitations of the study 40
5.5 Implications of study findings 41
5.5.1 Implications to the students and public health 41
5.5.2 Implications to the University 42
CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS 43
6.1 Conclusions 43
6.2 Recommendations 43
REFERENCES 45
APPENDIX I: 49
APPENDIX II: COMMUNITY ENGAGEMENT PLAN 51
APPENDIX III: PROPOSED BUBGET 55
APPENDIX IV: WORK PLAN 56
APPENDIX V: Consent form 57
APPENDIX VI: QUESTIONNAIRE 60

LIST OF ABBREVIATIONS

CDC	Centre for Disease Control
EC	Emergency Contraception
GUREC	Gulu University Research and Ethics Committee
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome.
IUCD	Intra Uterine Contraceptive Device
MoH	Ministry of Health.
STDs	Sexually Transmitted Diseases
SRH	Sexual Reproductive Health.
UBOS	Uganda Bureau of Standards
UDHS	Uganda Demographic and Health Survey
WHO	World Health Organization.

LIST OF FIGURES

Figure 1: Conceptual Framework 9

Figure 2: Student attitude towards use of EC 32

Figure 3: Reasons For Not Using Emergency Contraceptives..... 33

Figure 4: Source of information of EC 34

LIST OF TABLES

Table 1: Socio-demographic Characteristics of participants. (N=415). 27

Table 2:Prevalence of Emergency Contraceptive use 28

Table 3: Emergency contractive use by different social demographics (N=174) 29

Table 4: Sexual and Reproductive Characteristics 30

Table 5: Knowledge towards Emergency Contraceptive use 31

Table 6: Bivariable analysis for Factors Associated with EC 35

Table 7: Poisson regression analysis of Factors Associated with EC use 36

OPERATIONAL DEFINITIONS:

Abortion: was defined as the act of termination of pregnancy before the foetus reaches age of viability i.e. capable of independent extra uterine life, usually before 28weeks of Gestation.

Contraception: was defined as a deliberate prevention of conception or impregnation, by interfering with the normal process of ovulation, fertilization, and implantation.

Emergency contraceptive method was defined as any method used by the female student to avoid pregnancy after unprotected sexual intercourse, unlike the regular methods of contraception that are taken before sexual contact during her study period at the university.

Emergency contraceptive use was defined as a history of use of any emergency contraceptive method such as the pill, the coil (IUCD) by the female students during their study time at the University.

Pregnancy: was defined as the period during which a fetus develops inside a woman's womb following successful fertilization after unprotected sexual intercourse.

Sexual and Reproductive health: was defined as a state of complete physical, mental, and social well being and not merely absence of disease or infirmity in all matters relating to the reproductive system and its functions and processes. For this research, we considered female students in reproductive age group of 18-49 years who had ever used EC during their University Life.

Unwanted/intended Pregnancy was defined as a pregnancy that has occurred when the student does not want to have children, which may be because she already had the desired number of children, or it may not be time.

ABSTRACT

Background.

Emergency Contraceptive (EC) use after unprotected and unplanned sexual intercourse is critical, especially in active sexually reproductive populations like university students. This prevents unwanted pregnancies and associated abortions hence improved maternal health outcomes. This study investigated the prevalence and factors associated with emergency contraceptive use among female students of Gulu University.

Methodology.

This was a cross-sectional study involving female students, aged 18-49 years, at Gulu University from November 2023 to February 2024. Stratified random sampling was used to select 415 participants from different faculties and years of study. Self-administered questionnaires collected data on socio-demographic, health system &reproductive factors and individual factors on EC use. The collected data were processed and analysed using computer based statistical software Programs, STATA 18. Categorical variables were summarized using frequencies and percentages. Numerical data were summarized using mean and standard deviation, depending on the normality of the data. The results were presented in tables, graphs.

Bivariate analysis was performed to determine each of explanatory variables with outcome variable (utilization) and variables with $p<0.2$ during bivariate analysis were entered to multivariable analysis. Poisson regression tests was used to identify the association between the use of emergency contraception and the predictor variables because the prevalence of the outcome was greater than 10%. *P*-value less than 0.05 at 95% CI was taken as statistically significant.

Results

A total of 415 participants with mean age $\pm$ SD (24.54 ±4.80) and mostly third years (36.1%) were interviewed. There was a low utilization of EC, 41.9% (n=174). The key determinats of EC use were being in third year of study and previous use of regular contraceptives (aPR = 0.81, p = 0.009, 95% CI = 0.69-0.94) and (aPR = 1.23, p < 0.001, 95% CI = 1.11-1.37) respectively. Participants had good knowledge and positive attitudes towards EC with sexual partners 30.9% and female friends, 22.2% being the main sources of information on EC.

Conclusion.

Overall, this study found a low level of Emergency Contraceptive use. Year of study and previous use of regular contraceptives were strongly associated with EC use. Targeted interventions, tailored to students year of study are needed to improve awareness and uptake of emergency contraception.

Key words: Prevalence, Emergency contraception, Gulu University, female student

CHAPTER ONE:

1.0 INTRODUCTION

1.1 BACKGROUND

Emergency contraceptives (EC) refer to a group of birth control modalities that, when used after an unprotected sexual intercourse or condom breaks, within defined time limits can prevent an unwanted pregnancy (Kassa *et a*l., 2018). As it is difficult to accurately determine the infertile time of the woman's cycle, EC methods should be provided for any woman concerned about her risk of pregnancy as soon as possible, regardless of the cycle and day of exposure.

Sustainable development Goal 3 (SDG 3), focus area 2, focuses on maternal, newborn and child survival (Dowling *et al*., 2021) and there are established policies on family planning as a major pillar of safe motherhood, however little emphasis has been accorded to emergency contraceptives as a method of contraception.

Contraception has been majorly used for child spacing and population control (Sserwanja *et al*., 2021) and a lot of emphasis has been put on advocating for increased uptake of general/regular family planning methods. Several studies have been published on general contraceptives use and many countries have made significant progress on uptake of family planning methods by their citizens (Winfrey & Rakesh, 2014). Different contraceptive methods such as condoms, sexual withdraw, vasectomy, tuba-ligation, hormonal pills and IUCDs have been used as means for prevention of unwanted pregnancy However, some of these methods have found limited use among female university students and therefore have not been used in emergent sexual encounters. (guttmacher institution, 2017).

Emergency contraceptives were introduced in Uganda by the MoH in 1998 with the aim of improving reproductive health. However, the methods remain poorly known and unavailable for

many sexually active female students. There are majorly two EC methods: the hormonal Pill (the "morning after" pill**)** and the intrauterine contraceptive device (IUCD) (Olukayode & Amos, 2018)**.** Hormonal Pills are taken within 72-120 hours of unprotected sexual intercourse. The Progesterone-only Pill Levonelle must be taken within 72 hours (3 days) while Ella One (containing ulipristal acetate) must be taken within 120 hours (5 days) of unprotected sex to prevent pregnancy. The Copper bearing IUCDs on the other hand must be inserted within 5 days of unprotected sex when used as an emergency contraceptive method; it is more effective than the contraceptive pill in preventing pregnancy.

Globally, over 500,000 women die because of childbirth or complications due to unintended pregnancies. It is estimated that 13% of maternal deaths worldwide were due to unsafe abortions secondary to unintended/ unwanted pregnancies (Gemzell-Danielsson *et al.*, 2014). Abortions, especially criminal abortions as a result of un wanted pregnancies, are a major cause of pregnancy related haemorrhage sometimes ending in severe anemia and death (Alobo *et al*., 2022), 99% of these deaths occur in developing countries, with Asia and Africa alone taking 95% of the share of the world's maternal death (Bearak et al., 2020; Diniz et al., 2017).

The prevalence of EC use has been reported as low among university students in several studies**.** A study carried out in Europe by (Barbian *et al*., 2021) among female students of two Universities in the city of Santa Maria**,** the prevalence of EC was noted to be 52.9%. In Brazil, a study on EC among nursing students from a Public University in Goiás – a state in Brazil by (Santos *et al*., 2014) reported that, **a**lthough use lower than 50%.

In Africa, reproductive health issues- including emergence contraception, are of great concern given the rapid population growth on the continent and the youthful nature of its population. It has

been reported in several population studies that Africa has a large sexually reproductive population. As noted by (Nyambura *et al*., 2017) in study at Nairobi University, female students in University or College are vulnerable to unplanned pregnancies and illegal abortions resulting in mortality, morbidity, and psycho-social problems.

From anecdotal observations, various general contraceptive methods such as barrier methods like condoms, IUDs, etc. exist, their uptake among female students is unknown; uptake of EC may be much lower. This area may need more research due to the risks of unwanted pregnancies following unprotected sex, most of which end in criminal abortions with consequent hemorrhage and sometimes death! (Bearak et al., 2020; Diniz et al., 2017). Proper and effective EC use could be a good remedy for these unwanted/unplanned pregnancies.

In Sub-Saharan Africa a report by (Kwame *et al.*, 2022) showed that awareness rates about reproductive issues and EC ranged from 10.1 to 93.5%. EC use was relatively low, ranging from 0% in DR Congo and Ethiopia to 54.1% in Nigeria.

EC use was reported to be low in Ghana (36%) in a study by (Darteh & Doku, 2016) and Ethiopia (34.5%) in a study on EC use and practice among female University students in Ethiopia by (Fikre *et al*., 2020). Low EC use was also reported at Wollo University, Ethiopia by (Abrha *et al.*, 2017), reported that only 30.9%.

In Uganda, according to a UBOS 2017 report, 51 % of sexually active unmarried women (students inclusive), were reported to be currently using a contraceptive method. However, statistics of specifically EC use remain unknown in the general population (Maly *et al*., 2017; Uganda Bureau of Statistcs (UBOS) & ICF, 2017).

Several factors have been associated with EC use. For instance, in Nigeria, individual factors such as risk perception, fear of side effects, opposition from male partners, health service limitations & insufficient knowledge needed to make informed choices have been reported as barriers for utilization of emergency contraception (Darteh & Doku, 2016).

Previous studies have reported lack of knowledge, poor attitudes and practices as major contributing factors for low uptake of contraceptives (Kaye *et al*., 2014). However, there is paucity of data about the prevalence and factors associated with emergency contraceptives use among female students in Gulu University. We hence, investigated the prevalence and factors associated with EC use among female students of Gulu University.

1.2 Statement of the problem.

Emergency Contraception, if effectively and correctly used, remains the only proven method by which a woman can prevent unwanted/ unplanned pregnancy after unprotected sexual intercourse. Unwanted pregnancies among university students, , are a significant public health concern due to their association with adverse outcomes such as unsafe abortions, school dropouts, and even maternal deaths (Kumari *et al*., 2016).

Most female University students are active sexually reproductive young adults in reproductive years and at the climax of teenage/ Adolescence period, these often engage in unplanned and often unprotected sexual activities which makes them vulnerable to unwanted pregnancies after unprotected sexual encounters. Furthermore, limited access to and unavailability of EC contribute to low utilization, The unsupportive environment from university and partner in addition to social, culture and religious norms further complicate the use of EC among this sexually active population segment.

Emergency contraception (EC) offers a potential solution to prevent these unwanted pregnancies, but its utilization remains low among female students in most studies especially those done in developed countries . The prevalence and factors influencing the use of emergency contraceptives among female students at Gulu University are not well understood.

There being no published data on knowledge and utilization of EC by Gulu University female students, there is a possibility that inaccurate use, fear of side effects and stigma associated with EC use exist among these female students leading to a possibly low prevalence of EC use. This study investigated the prevalence and factors such as socio-demographic, health system, sexual and reproductive factors associated with EC utilization in this population.

1.3 Study justification.

Emergency Contraceptive use after unprotected sexual intercourse helps to prevent unwanted or unplanned pregnancies, which often end into unsafe abortions. Unwanted pregnancies among female university students can have far-reaching consequences, including unsafe abortions, distraction form academics or school dropouts, and even maternal deaths. Emergency contraception (EC) provides a crucial option to prevent these unintended pregnancies, but its utilization remains sub-optimal, especially in resource-limited settings like Gulu University.

Understanding the prevalence and factors associated with EC use among female students at Gulu University is essential for developing targeted interventions to address this public health challenge. Limited research has been conducted on this topic within the local context, leaving a gap in knowledge that needs to be filled.

In Gulu University, there could be general lack of adequate information on EC methods among the students. There is also possibility of inaccurate use, possible fear of side effects and stigma

associated with EC use among the female students. From available literature and observations, many female students do not know the correct time to take EC, and some may have different concerns about EC methods which need to be clarified.

There is paucity of data on prevalence of EC use and associated factors among Gulu University Female students and with such challenges related to EC use and inadequate data on EC use, there is need for more research in this area to generate accurate information.

This study will hence help to determine the prevalence of EC use and any barriers to usage. This information will be used to educate adolescents/ young people about EC, with emphasis on the correct time limit for use, which may in turn increase uptake of EC. The study findings may as well facilitate a review of the MoH reproductive health policy with an aim of catering for special categories of the population like the sexually active university students and foster the attainment of WHO SDG 3.

1.4. Study Significance

Effective emergency contraceptive use reduces the burden of reproductive ill health by decreasing mortality and morbidity associated with unwanted pregnancies. This study on the prevalence and factors associated with emergency contraceptive (EC) use among female students at Gulu University holds significant importance for several reasons.

Unwanted pregnancies among university students are a pressing public health concern, often leading to adverse outcomes such as unsafe abortions, school dropouts, and maternal morbidity and mortality. Investigating the utilization of emergency contraception can provide crucial insights to address this problem. The findings from this study shed light on the barriers and facilitators of EC use among the target population. This information can guide the development of tailored

interventions, educational campaigns, and policy recommendations to improve awareness, access, and uptake of emergency contraception within the university setting.

Increasing the use of emergency contraception has the potential to empower female students and promote their sexual and reproductive health autonomy. The study's outcomes can contribute to reducing the burden of unwanted pregnancies and their associated negative consequences. There is limited research on the prevalence and determinants of EC use among female university students in the local Gulu context. This study will help fill this gap in the literature and provide valuable insights that can be applicable to similar settings. The findings from this study can serve as a foundation for further research on the sexual and reproductive health needs of female university students, as well as the development and evaluation of interventions to address these needs.

Furthermore, the study findings may be used to inform the health policy makers and implementers of SRH programs on the needs for special consideration of University students in family planning and population control programs. The study findings may also be used to explore the need to establish or activate SRH clinics in Universities and Tertiary institutions.

1.5 Research Questions

1. What is the prevalence of emergency contraceptive use among female students of Gulu University?
2. What are the factors associated with EC use among female students of Gulu University?

1.6 Study objectives.

1.6.1 General objectives.

To assess the prevalence and factors associated with emergency contraceptive use among female students (aged 18-49years) of Gulu University, Uganda.

1.6.2 Specific objectives:

1. To determine the prevalence of emergency contraceptive use among female students of Gulu University.
2. To determine factors associated with emergency contraceptive use among female students of Gulu University.

1.7 Scope of study

The study was focused on female Students of Gulu University main campus, located in Laroo Division of Gulu City, who were available at campus during the time of data collection (November 2023 -February 2024) and consented to voluntarily participate in the study.

1.8 CONCEPTUAL FRAMEWORK

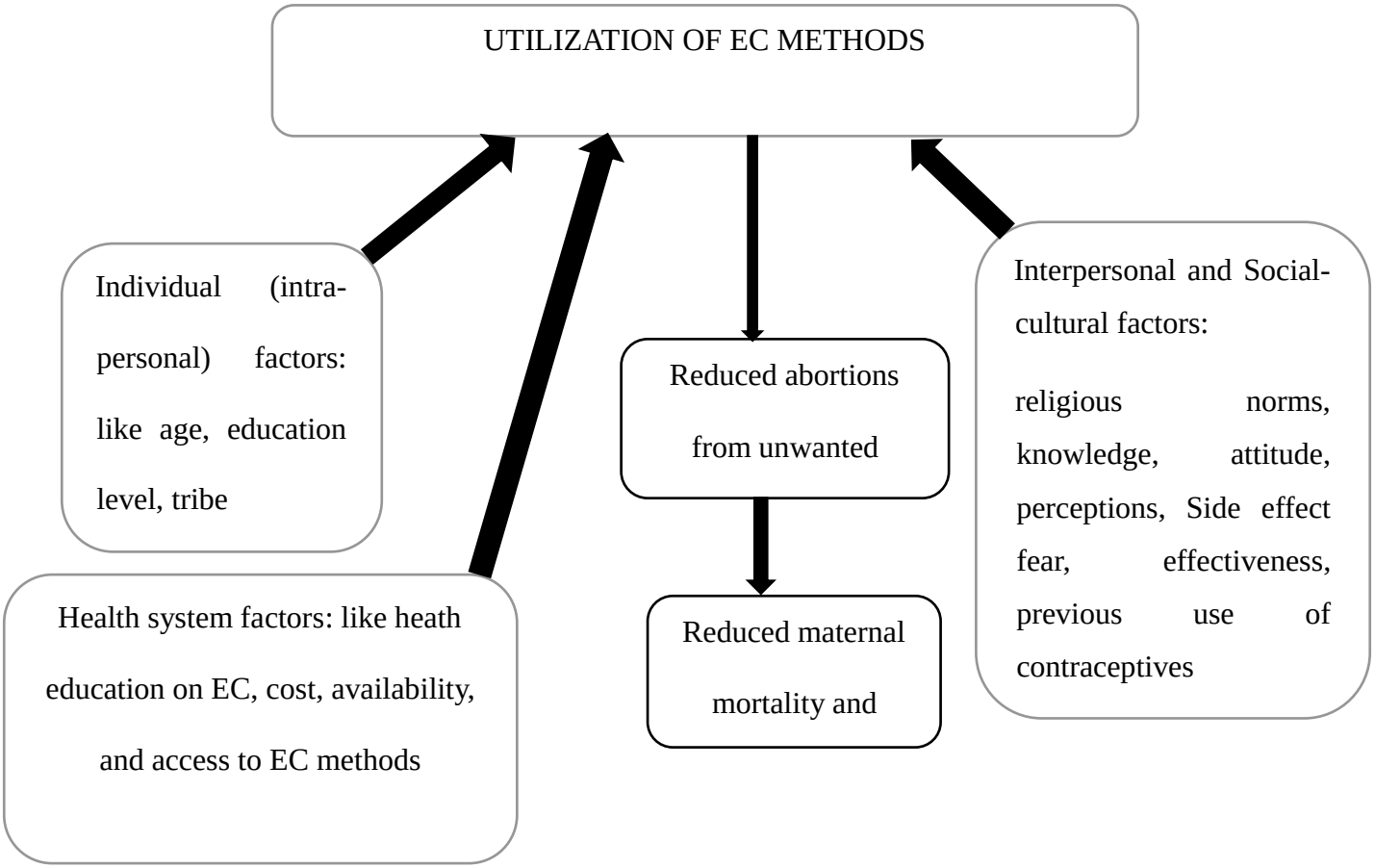


Figure 1: Conceptual Framework, as conceptualized from the socio economic model for social determinants of health.

As illustrated in the above figure, Utilization of emergency contraception is dependent on several socio-demographic factors which vary from one female student to another. Choice of method to use, where to access it from and correct usage may be determined by level of knowledge, education status, marital status, affordability (money) and available information about the EC

method. Furthermore, Social stigma and negative perceptions attached to contraception may affect usage.

Individual factors like attitude towards EC use, level of knowledge about EC, factors like fear of side effects and desire to have children may lead to improper or proper usage of EC. Negative attitudes, low knowledge levels, excessive fear of side effects and issues around effectiveness and myths may lead low Utilization of EC methods and vice versa. A couple desiring to have a child or if one of the partners wants to have a child, s/he may not recommend use of EC after unprotected coitus.

Availability of the EC methods and ease of access in the health facilities coupled with the health workers attitude towards the females seeking EC may, among other Health system factors like adequate EC policy, affect how EC services will be utilized.

Individual factors or a combination of these factors will hence affect the decision to use or not to use EC.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provides information on the existing knowledge on contraception, use of emergency contraception and factors associated with EC as reviewed from existing research publications.

2.2 Overview: Emergency Contraception and Practice

The proportion of young women reporting unintended pregnancy and unmet need for contraception remains high in developing countries. According to (Adinma *et al*., 2011) unintended pregnancies are associated with increased risk of unsafe abortions, maternal morbidity and mortality.

According to (Demissie *et al*., 2020), the most used types of EC are Postinor 2 (levonorgestrel), EC pills such as Norlevo (levonorgestrel only) and Nodette (levonorgestrel and estradiol), and intrauterine contraceptive device (IUCD). This was also observed in a study in Ethiopia by Emergency contraceptive pills, such as hormonal ones, are taken within 72 hours of unprotected sexual intercourse, followed by another dose 12 hours later. Progesterone-only pills require the first dose to be taken as soon as possible, but not later than 3 days after unprotected intercourse, followed by another dose 12 hours later. Levonelle must be taken within 3 days of unprotected sex, while Ella One, containing ulipristal acetate, should be taken within 120 hours to prevent pregnancy. The copper-bearing IUCD, when used as an emergency contraceptive method, should be inserted within 5 days of unprotected sex.

In Tanzania, there are legal restrictions on pregnancy termination, but it is commonly practiced in unsafe conditions, leading to high maternal morbidity and mortality rates. Despite this, the majority of abortion-related deaths and unintended pregnancies are preventable. To achieve Millennium Development Goal 5, which aims to reduce maternal mortality and ensure universal access to

reproductive healthcare by 2015, it is crucial to enhance access to contraceptives, provide comprehensive post-abortion care, and increase the availability of safe abortion services within the existing legal framework. (Woog, 2013).

In Uganda, according to a study by (Kaye et al., 2014), EC methods used include pills (86.7%) and intrauterine devices (IUDs) (35%). Hospitals, both government (64.3%) and private (53.6%), are the primary sources of contraceptives. Clinics, including general clinics (24%) and those specifically for contraceptives (27.4%), are also significant sources. Additionally, pharmacy/drug shops contribute to contraceptive access, accounting for 36% of usage.

2.3 Prevalence of Emergency Contraceptive Use.

Low Utilization of EC methods has been reported in many studies among university students globally and in Africa. No published data on EC utilization in Uganda.

In Europe, a study by (Barbian *et al*., 2021) among female University students at two universities in City of Santa Maria showed that the prevalence of EC use among undergraduates was 52.9%. However, only 11.9% of respondents received guidance on EC, especially on how to use it.

In Sub-Saharan Africa, a report by (Kwame *et al*., 2022) showed that awareness rates about EC ranged from 10.1 to 93.5% (both reported from Ethiopia). The level of use was relatively low (ranging from 0% in DR Congo and Ethiopia to 54.1% in Nigeria).

As reported by (Barbian *et al*., 2021) adequate practice of emergency contraception and its availability is lacking among the female college students. Low uptake and use of EC has also been reported in another study at University of Cape Coast students by (Darteh & Doku, 2016), only 57% of the respondents had ever heard of EC and 36% had ever used EC.

Several studies on EC use among Ethiopian students have showed low EC use! Prevalence of EC use among Ethiopian students was 34.5% as reported by (Kassebaum *et al*., 2014). In another study, only 157 (30.9%) used emergency contraception after unprotected sexual intercourse to prevent unwanted pregnancy (Nigus & Tilahun, 2017).

Also, study findings by (Sunguya *et al*., 2019) showed that only 46.3 % of the participants had used EC following unprotected sex. As study by (Kumari *et al*., 2016) found that 74.9% were knowledgeable about EC but only 48.5% had favorable attitude and 18.4% female students ever used contraception. This study showed that knowledge and awareness does not always translate into use!

In Tanzania, a 34.4% contraceptive prevalence rate was reported among women of reproductive age (15–49 years). Contraceptive prevalence use rate is 19% among female aged between 20 and 24 years, and the teenager pregnancy rate of 44% (Sunguya *et al*., 2019).

These study reports underscored the need to increase awareness regarding EC among University students in order to offer them the opportunity that EC provides if other forms of contraceptives are missed.

2.4 Factors Associated with use of EC

2.4.1 Socio-demographic factors

In a report by (Barbian *et al*., 2021) EC use was associated with the age of first sexual intercourse. In this same report a significant number of respondents had different concerns about effectiveness of emergency contraceptive methods which needed to be clarified about.

In one of the studies, marital status and maternal age were found to likely affect decision to use or not to use EC. Among the married or couples, several factors have been cited to favor use or as barriers to EC utilization. As cited by (Indraccolo *et al*., 2020) in one of the studies in Sub-Saharan Africa on the determinants of contraceptive decision making among married women in Sub-Saharan Africa.

Area of residency e.g urban Vs rural setting was found to be related to EC use study by (Indraccolo *et al*., 2020).

Having busy/ working partners was also found to affect decision to use or not of EC with women with working husbands being more likely to use contraceptives up to 1.25 times relative to women whose husbands/ partner had no work (Indraccolo *et al*., 2020).

This study hopes to investigate if age of the female student, marital status and area of resident may be associated with EC use.

2.4.2 Health system factors

Having proper information and knowledge on EC methods and sexual reproductive issues is very crucial for effective EC use.

As cited in this Ghana study on sexuality and SRH by (Engel *et al*., 2019), to ensure that adolescents achieve sexual health and rights and avoid negative health outcomes, the timely provision of accurate and comprehensive information, along with life skills training, regarding sexual and reproductive health and rights is deemed essential. Education on sexuality and sexual reproductive health is seen as crucial for guiding adolescents in making informed decisions about their sexual lives. It has been observed that abstinence-only education programs have limited evidence in improving sexual and reproductive health outcomes.

According to (Awusabo-Asare *et al.*, 2017), comprehensive sexuality education programs, acknowledging that sexual activity may occur during adolescence, aim to promote the safety of such behaviour and empower students with knowledge to make informed choices, including the option to delay sex. These programs focus on human rights, gender equality, and empowerment, demonstrating impact outcomes in various areas. Notably, they contribute to improving knowledge, self-confidence, and self-esteem among participants. Moreover, they bring about positive changes in attitudes, gender norms, and social norms. These programs also enhance decision-making and communication skills, building self-efficacy, and result in an increased use of condoms and other contraceptives.

Similar interventions of health education to scale up EC use were reported by (Kassebaum *et al*., 2014)"there is a need to educate adolescents about emergency contraception, with emphasis on the correct time limit for use, the situation when they use it and accurate message about its effect on health. Moreover, health education program should be set up to the university and college students to give accurate information about emergency contraception".

In Brazil, a study on emergency contraception among nursing students from a public university in Goiás – a state in Brazil by (Santos *et al*., 2014), although many students use this method, there are still some doubts about the mechanism of action, side effects and access availability (frequency of correct answers lower than 50%). A need to develop educational policies that encourage the promotion of sex education in schools and universities.

Lack of privacy and inconvenience of EC access facilities was also reported in another study by (Nigus & Tilahun, 2017) in Ethiopia where 158 (31.1%) respondents did not consider the University clinic as convenient for emergency contraceptive usage.

In another report by (Nigus & Tilahun, 2017) Rude and disrespectful health workers was seen as a barrier to EC access and use. This was reported by 52 (33%) of the respondents. Other reasons were “un-respectful approach of health workers who worked in the university clinic (30.4%), inconveniency of time (18.0%), unavailability of drugs (8.2%), lack of privacy (6.3%), and health workers unwilling/unfriendly nature (3.2%).

2.4.3 Individual factors

In one published article in Nigeria, individual factors such as risk perception, fear of side effects, opposition from male partners, health service limitations and insufficient knowledge needed to make informed choices have been reported as barriers for utilization of emergency contraception.” (Adinma *et al.*, 2011)

Low levels of knowledge or lack of adequate information has been associated with low EC use. This has been reported in a study by (Hounton *et al.*, 2015) with results indicating that female students’ knowledge about the general features of EC was low and misinformation was high. The knowledge summary index about EC showed that the majority, 238 (71.7 %) of the respondents had poor knowledge on EC. (Kassa *et al*., 2018) reported similar challenge in another Uganda study of EC.

In a study by (Hounton *et al.*, 2015) age of first sexual intercourse, previous use of regular contraceptives and history of being pregnant were major predictors for EC utilization among female students.

Timing of EC use is very crucial in preventing unwanted pregnancies. However, poor timing was cited in a study in Europe (Barbian *et al.*, 2021) where only 0.2% of the participants marked 120 hours as the maximum time of use. Similar report was given by (Indraccolo *et al*., 2020) among

university students in Ethiopia; “Time of intrauterine contraceptive device (IUCD) insertion among respondents within 72hrs was 131 (25.8%), within 5 days was 87 (17.1%), and “I do not know” was 290 (57%).

Similarly, in the same reports by (Barbian *et al*., 2021); (Engel *et al.*, 2019) worries of the ineffectiveness of the EC methods was a main barrier to use: *“regarding to the efficiency of EC pills, 46 (57.1%) responded that the efficiency of emergency contraception to prevent unwanted pregnancy was 50%, but 160 (25.8%), 54 (17.1%), and 51 (10%) of the respondents said it was 99, 75, and below 30% efficient in preventing unwanted pregnancy”*; and in Europe only 25.7% considered the EC to be abortive.

Fear of side effects and lack of privacy were reported as barriers to EC use among the female Ethiopian University Students who did not use emergency contraception methods. Fear of side effects (351, 69.1%), 278 (54.7%) 51 (10.0%) was due to lack of privacy, 16 (3.1 %) was due to lack of knowledge, and 5 (1.0%) was due to fear of parental disapproval. (Maly *et al*., 2017)). Similar findings were reported in a study in Nigeria among young female students of tertiary educational institutions: “individual factors such as risk perception, fear of side effects, opposition from male partners, health service limitations and insufficient knowledge needed to make informed choices have been reported as barriers for utilization of emergency contraception.” (*(PDF) Knowledge and Perception of the Nigerian Abortion Law by Abortion Seekers in South-Eastern Nigeria*, n.d.).

CONCLUSION

Factors influencing the utilization of emergency contraception (EC) among university students, as highlighted in various studies, encompass a range of individual, social, and systemic elements.

Insufficient knowledge and misconceptions about EC, fear of side effects, lack of privacy, and inconvenient access facilities contribute to barriers in usage. Additionally, concerns about the effectiveness of EC methods and opposition from partners, along with challenges in health service provision, impact utilization. Comprehensive sexuality education programs have been identified as effective interventions to enhance knowledge and decision-making skills.

Furthermore, the timing of EC use, the attitudes of health workers, and socio-demographic factors among married individuals also play a role. To address these challenges and improve EC access, evidence-based interventions, such as health education programs and youth-friendly policies, are crucial. Recognizing these factors is essential for implementing targeted strategies that can contribute to reducing unintended pregnancies, unsafe abortions, and associated health risks among university students. The findings underscore the need for tailored interventions to promote informed decision-making and improve access to EC services, thereby addressing the broader reproductive health challenges faced by this demographic.

With the above challenges of low knowledge on emergency contraceptives, misconceptions on use and mode of action and the presumed unmet need among university students, there is need for evidence-based interventions to be in place to improve the access to proper knowledge on emergency contraception and making the service available. Issues like fear of side effects as cited above, poor attitude of health workers, health system challenges like inaccessibility or lack of availability of EC methods and challenges of lack of money to afford EC methods need to be comprehensively addressed.

This study determined such factors that could be impediments to utilization of EC methods among female University students. By identifying these challenges, health interventions like health

Education programs on proper EC use and benefits and development of teenage and youth friendly policies on EC use can be put in place to address them. This helps to address issues of teenage pregnancies, unwanted pregnancies, and unsafe abortions with its related morbidity and maternal mortality as well as population check.

This study findings hence add to the available evidence that can be used to support intervention to scale up EC use as a tool for addressing unwanted pregnancies and its associated complications like abortion, school dropout, bleeding and infections and death that may arise due to unsafe abortions.

CHAPTER THREE: METHODS

3.1 Study Design

An institution-based cross-section study carried out from November 2023 to February 2024 recruiting Gulu University female students aged 18 to 49 years.

3.2 Study area

The study was conducted at Gulu University main campus. Gulu University is a multi-campus public University located in Northern Uganda in Gulu City, Laroo-Pece division, Laroo Subcounty, Agwe parish-Obiya highland village/Cell. The main campus of Gulu University is located approximately 2km northeast of Gulu City. This location is approximately 320Km (200 mi), by road, north of Kampala, Uganda's capital and largest city. The coordinates of the university's main campus are: 02 47 24N, 32 19 01E (Latitude:2.7900; Longitude:32.3170).

The University had over 5,000 students, of which over 2000 were females. The University is non-residential with no halls of residence, but students rent hostels around the campus. It has a health centre from where the students access free health related services, EC services inclusive, but students are free to accesses these services from other private and public health facilities of their choice and affordability. There was a public Health centre 3 (Laroo HC3), a Regional referral hospital within reach of the students (about 1km form students' hostels) and several private health facilities, including many clinics, medical centres, drug shops, pharmacies and private Hospitals.

3.3 Study population:

Female University students, both on weekday and weekend study programs. Female students formed a significant number of students' populations in university

3.3.1 Target population

Female University students of age 18 to 49years who consented to participate in the study.

3.3.2 Accessible population

Female students of Gulu University main campus who met the eligibility criteria and were available during the time of data collection.

3.4 Selection criteria

3.4.1 Inclusion criteria:

Female students of Gulu University main campus who were present within the University premises during the study period and willing to participate in the study with informed consent.

3.4.2 Exclusion criteria:

All female students who failed to comprehend the questionnaire perhaps due to mental ill health were excluded from the study. Female students with history of hysterectomy, pregnant or breastfeeding at the time of the study.

3.5 Sample size estimation

The sample size was estimated using modified Kish Leslie formula (Kish -Leslie 1965)

Where the sample was given by,

$$N = \frac{z^2 p.q}{d^2}$$

Where N = the sample size

Z=1.96(the Z score value corresponding to 95%level of confidence on the standardized normal distribution curve)

P=0.6185, the proportion outcome, as obtained from a study on contraception by (Indraccolo et al., 2020).

q=1-p

d =0.05 which is the absolute precision

Therefore, substituting for N

$$N = \frac{1.96^2 \times 0.6185 \times 0.3815}{0.05^2}$$

N=362.58 (~363).

In addition, assuming 10% non-respondents (0.1*363=36.3). Therefore additional 37 students were planned to cater for non-respondents and those who would withdraw away during the interview to make 400 students; however, 415 students were interviewed.

3.6 Sampling procedure

Simple random sampling technique was used to select the study participants from the different Faculties. Lists of female students in each Faculty was obtained from Deans of Faculties. Simple random sampling technique was used to select the study participants. Briefly, in each class or group of participants, a YES and NO was written on sheet of papers. These papers were folded, mixed thoroughly, and placed in a non-transparent polythene bag where students picked a piece of the paper, one at a time participate in the study or not. If a student picked paper marked YES, she was included in the study. However, those who picked papers marked NO were excluded from the study. If selected individuals refused to take part, the next persons who consented to participate were selected in the study.

3.7 Study variables

3.7.1 Independent variables:

Independent variables included factors such as: socio-demographic, health system and individual factors.

3.7.2 Dependent variable:

Emergency contraceptives utilization by Gulu University female students.

3.8 Data collection procedure

Self-administered structured questionnaires were used. A prior tested and designed questionnaire that had been previously used in related studies was adopted and used for data collection (Abate *et al., 2014)*. The questionnaires were delivered by 10 trained research assistants, who were students. The questionnaires collected data on participants' socio-demographic characteristics, Attitudes, knowledge on EC use, where they accessed the EC methods from, and any challenges faced while trying to access or use the EC methods. Participant's names were excluded for purposes confidentiality and questions were coded.

3.9 Data management

Unique identifiers were used during data collection to ensure privacy and confidentiality of participants. Data was kept out of reach of unauthorized persons, with questionnaires kept on waterproof file folders to prevent damage by water or weather changes. Data was double checked for accuracy and completeness, entered Microsoft spreadsheets, cleaned, coded, and then exported to STATA 18, data software for analysis. Several data backups were obtained and stored in other computers with password protection.

3.10 Data analysis

The findings were processed and analysed using computer based statistical software Programs, STATA 18, Categorical variables were summarized using frequencies and percentages. Numerical data were summarized using mean as a measure of central tendency and standard deviation as a measure of spread, depending on the normality of the data. The results were presented in tables, graph, and Pie Charts. Likert scale was used to analyze attitudes of participants toward EC.

Bivariate analysis was performed to determine each of explanatory variables with outcome variable (utilization) and variables with $p<0.2$ during bivariate analysis were entered to multivariable analysis. Poisson regression tests was used to identify the association between the use of emergency contraception and the predictor variables because the prevalence of the outcome was greater than 10%. *P*-value less than 0.05 at 95% CI was taken as statistical significance.

3.11 Quality control

An adopted and standardized Questionnaire from previous studies as cited above was used.

3.13 Ethical considerations

Approval to carry out the study was soughted from the Gulu University Research and Ethics committee (GUREC-2023-692) and clearance for data collection was soughted from the University administration (Office of Dean of Students). Informed consent was obtained from all respondents before participating in the study. As detailed in the attached informed consent from, the participants were voluntarily requested to participate in the study, and they were also free to withdraw from the study at any time with no penalty. The principal investigator being the University medical officer did not directly engage the participants. The trained research assistants

engaged the study participants. Confidentiality of information were provided by ensuring that a space was left on top of each questionnaire for participant to include their research numbers but not name. No personal identifiers of the participants like their names were asked for. All filled questionnaires were kept out of reach unauthorized personnel.

3.14 Dissemination of results

The results of the study will be disseminated to peer reviewed journals, Presented in conferences and seminars at National and International levels. A copy of the report will be submitted to Department of public health, Faculty of Medicine for archiving in the University library and a copy to the Gulu University authorities for policy formulation where it is necessary.

3.15 **Covid 19 mitigation**

Covid-19 SOPs, as per the MoH and University guidelines, were observed by the research assistants, all participants and in all engagements with the students' community or authorities. Face masks and hand sanitizers were provided to research assistants for use during questionnaires handling and data collection or any other community engagements related to the study. **See appendix I for details.**

3.17 Community engagements

Consultative meetings, workshops, seminars and student's community outreaches (such as to lecture rooms, hostels, meeting points) to sensitize them about EC will be organized. Both general/broad and specific objectives of the study will be shared with the participants, University authorities and the students' community during these engagements. The University and student's leadership will be involved throughout the entire period of research and study results dissemination,

we will receive feedbacks and where appropriate, take necessary actions. Participants will participate by voicing their opinions, criticisms, or experiences. The student's community will be sensitized on the study relevancy and permissions from the relevant authorities, both administration and Guild leaderships will be sought. In all these engagements, any risks to the participants' wellbeing will be appropriately addressed and, both the research assistants and the study participants will be encouraged to observe the Covid-19 SOPs so as to mitigate against any possible spread of Covid-19 disease. Furthermore. During these engagements, any fears or concerns of participants and other stake holders in regard to the study will be timely addressed and feedbacks given. **See appendix II for details.**

CHAPTER FOUR:

4.1 Socio-demographic Characteristics of Female Students of Gulu University

As in table 1 below, of the 415 participants, the mean age (standard deviation) of the participants was 24.54(4.80) years, majority in third year of study 36.1% (n= 150) and mainly pursuing Education programs 28.4%(n=118). Furthermore, majority participants identified as Acholi by tribe 30.6% (n=127), not married (single)74.0%(n=307) and protestants by religion 38.1% (n=158).

Table 1: Socio-demographic Characteristics of participants. (N=415).

Variable	Freq. (%)
Age: Mean (standard deviation)	24.540 (4.798)
Year of study	
First year	110 (26.5%)
Second year	101 (24.3%)
Third year	150 (36.1%)
Fourth year	46 (11.1%)
Fifth year	8 (1.9%)
Faculty/ institute of participants	
Agriculture and Environment	53(12.7%)
Medicine	32 (7.7%)
Education and Humanities	118 (28.4%)
Business and development Studies	128(30.8)
Science	34 (8.2%)
Law	45 (10.8%)
Institute of Peace and strategic studies	5 (1.2%)
Marital status of participants	
Single	307 (74.0%)
Married	82 (19.8%)
Divorced	14 (3.4%)
Widowed	12 (2.9%)
Religion of participants	
Orthodox	20 (4.8%)
Protestant	158 (38.1%)
Muslim	46 (11.1%)
Catholic	147 (35.4%)
Others	44 (10.6%)
Tribe of participants	
Acholi	127 (30.6%)
Lango	66 (15.9%)
Muganda	66 (15.9%)
Musoga	38 (9.2%)
Itesot	44 (10.6%)
Munyankore / Mukiga	18 (4.3%)
Munyoro / Mutoro	18 (4.3%)
Mugisu	18 (4.3%)
Others	20 (4.8%)

4.2 Prevalence of Emergency Contraceptive use among Female Students of Gulu University.

As illustrated in table 2 below, 41.9% (n = 174) have utilized emergency contraception since joining the campus, with majority of these 79.9% (n = 139) having opted for Emergency contraception Pills and 20.1% (n=35) opting for IUCDs.

Table 2: Prevalence of Emergency Contraceptive use

Variable	Freq (%)
Emergency contraceptive use	
Yes	174 (41.9%)
No	241 (58.1%)
EC Method used?	
Emergency contraception Pills	139 (79.9%)
IUCD	35 (20.1%)

4.2.1 EC use across selected sociodemographic characteristics of the students.

Female students aged 20-24 years were the main users of EC, 56.32%, followed by those aged 25-29 years, 33.33% and age group 30-35 years being the least users at 2.87%. female who identified as being protestant by religion were the main users of EC, 42.44%, followed by Catholics 35.47% and least users identified with orthodox religion, 4.07%. Female students in third years of study were the major users of EC, 45.83%. These were followed by students in second year, 23.81%, fourth year, 15.48% and least users being in fifth year of study, 3.57%. **This is summarized in Table 3 below.**

Table 3: Emergency contractive use by different social demographics (N=174)

Characteristics	Categories	Frequency (n)	Percentage of EC use
Age	<20	2	12.5%
	20-24	98	56.3%
	25-29	58	33.3%
	30-34	5	2.9%
	>34	11	6.3%
Years of study	1	19	11.3%
	2	40	23.8%
	3	77	45.8%
	4	26	15.5%
	5	6	3.6%
Religion	Protestant	73	42.4%
	Catholic	61	35.5%
	Muslims	22	12.8%
	Orthodox	7	4.1%
	Others	9	5.2%
Marital status	Single	120	69.1%
	Married	44	25.6%
	Divorced	8	4.7%

4.3 Factors associated with Emergency Contraceptive use.

4.3.1 Individual Factors

4.3.1.1 Sexual and Reproductive Characteristics of Female Students of Gulu University

As detailed in table 4 below, Majority respondents, 60.5% (n = 251), had engaged in sexual activity since joining the campus with the mean age (standard deviation) at first sexual intercourse being 20 (±3.014) years. Additionally, 67.9% (n = 169) of the 251 participants who had engaged in sexual intercourse reported having had unprotected sexual intercourse. Among those who engaged in unprotected intercourse, 32.7% (n = 55) reported pregnancies of which 50.9% (n =27) of these pregnancies were unintended.

Over 50% of the 251 sexually active respondents, that is, 53.8% (n=133), had ever used regular contraceptive methods.

Table 4: Sexual and Reproductive Characteristics

Variable	Freq (%)
Ever had sex since joining campus	
Yes	251 (60.5%)
No	164 (39.5%)
Mean Age at the first sexual intercourse	20 (±3.014)
Ever had Unprotected sexual intercourse	
Yes	169 (67.9%)
No	80 (32.1%)
Pregnant due to unprotected sex	
Yes	55 (32.7%)
No	113 (67.3%)
Unintended pregnancy	
Yes	27 (50.9%)
No	26 (49.1%)
Used of regular contraceptive previously	
Yes	133 (53.8%)
No	114 (46.2%)

4.3.1.2 Knowledge and attitudes towards Emergency Contraceptive use

Participants had good general knowledge about emergency contraceptives 73.0% (n=303), with more than half of the participants 67.5% (280) correctly citing the methods of contraception and right timing of EC pill use, 66.7% (277) respectively, **as illustrated in Table 5 below**.

Participants however had challenges correctly identifying in which circumstances to take the pill and effectiveness of the Emergency pill, misinformation like under which circumstances to use the EC pill (8.9%) and a few were ignorant on dose of EC pill (41.2%) and interval between pill doses (43.9%).

Table 5: Knowledge and perceptions towards Emergency Contraceptive use

Variable	Freq (%)
Methods for emergency contraception	
Combined oral contraceptive	176 (42.4%)
Progesterone only pills & IUCD	104 (25.1%)
Anti-biotic like ampicillin	6 (1.4%)
I don't know	129 (31.1%)
EC prevents sexually transmitted infections	
Yes	77 (18.6%)
No	234 (56.4%)
I don't know	104 (25.1%)
When to use emergency contraception (more than one answer)	
If condom ruptured during intercourse	
No	188 (45.3%)
Yes	227 (54.7%)
When there is a missed pill	
No	312 (75.2%)
Yes	103 (24.8%)
When forced to have sex/raped	
No	153 (36.9%)
Yes	262 (63.1%)
When there is failure of contraception	
No	378 (91.1%)
Yes	37 (8.9%)
I don't know	
No	352 (84.8%)
Yes	63 (15.2%)
Recommended time limit to take EC Pills?	
Within 24 hours after sex	91 (21.9%)
Within 72 hours after sex	186 (44.8%)
Within 5 days after sex	14 (3.4%)
I don't know	124 (29.9%)
Effectiveness of EC Pills in preventing pregnancy?	
Highly effective (>95%)	89 (21.4%)
Effective (75-89%)	173 (41.7%)
Less effective (<10%)	37 (8.9%)
Not effective at all	9 (2.2%)
I don't know	107 (25.8%)
Recommended number of doses of EC Pills?	
One dose	186 (44.8%)
Two doses	58 (14.0%)
Three doses	17 (4.1%)
I don't know	154 (37.1%)
Recommended time interval between the doses of EC Pill	
12 hours apart	67 (16.1%)
24 hours apart	70 (16.9%)
72 hours apart	96 (23.1%)
I don't know	182 (43.9%)

4.3.1.3 Attitude towards Emergency Contraceptive use

Generally, students had positive attitudes and beliefs towards EC use, 81.2% (n=337) as illustrated in the Bar graph below. A few participants, 12.8% (n=53), had a negative while 6% (n=25) had neutral attitude.

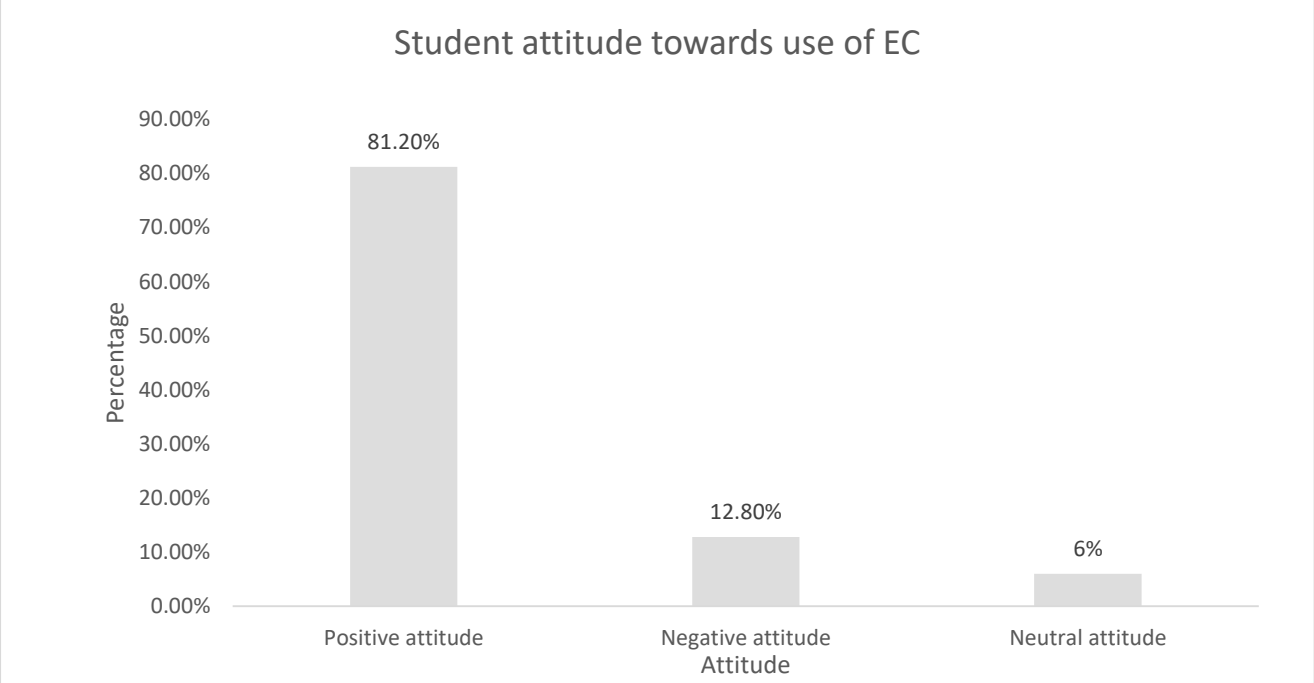


Figure 2: Student attitude towards use of EC

Additionally, 38.3% (n = 159) student, strongly agreed that the provision of EC after unsafe sexual intercourse can prevent unwanted pregnancy, 46.0% (n = 191) agree that all females have the right to access EC. However, 32.8% (n = 136) think that EC use promotes promiscuity, 36.1% (n=150) think believes that it can hurt the baby, over 28% believe that EC use causes abortion.

4.4 Reason for Not Using Emergency Contraception

As shown in the bar graph below, Negative attitudes towards emergency contraception (n=76) was the major barrier to EC use followed by lack of adequate knowledge (n=44) and religion (n=44). Other reasons for non-use were uncertainty of its effectiveness (n=30), - lack of partner support

(n=14), fear of being seen by others (n=18) and inconvenient service delivery (n=11).

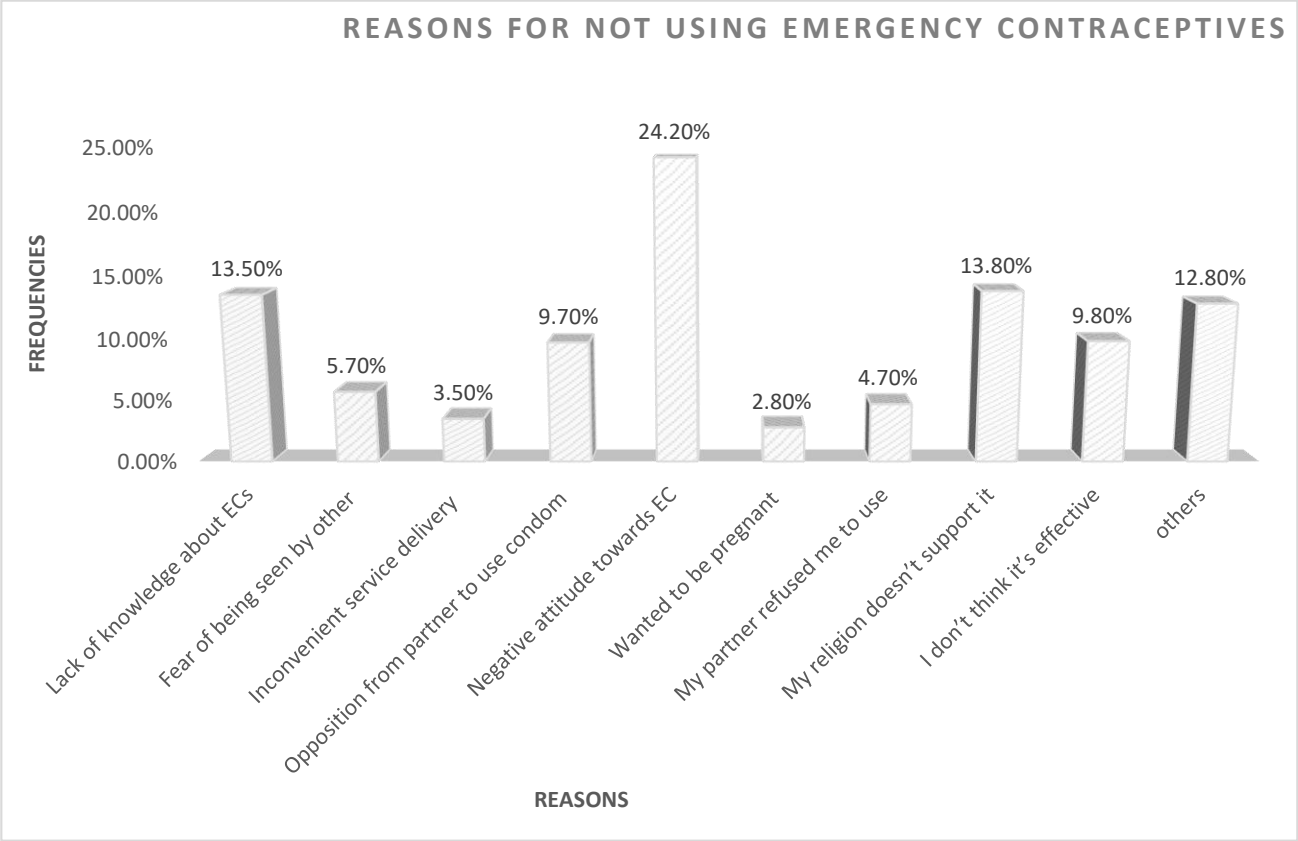


Figure 3: Reasons For Not Using Emergency Contraceptives

4.5 Sources of information on emergency contraceptive.

As illustrated in Figure 4 below, Sexual partners were the main source of information on EC (n=99) followed by female friends (n= 71), health workers (n=68) &web pages/internet (n=18).

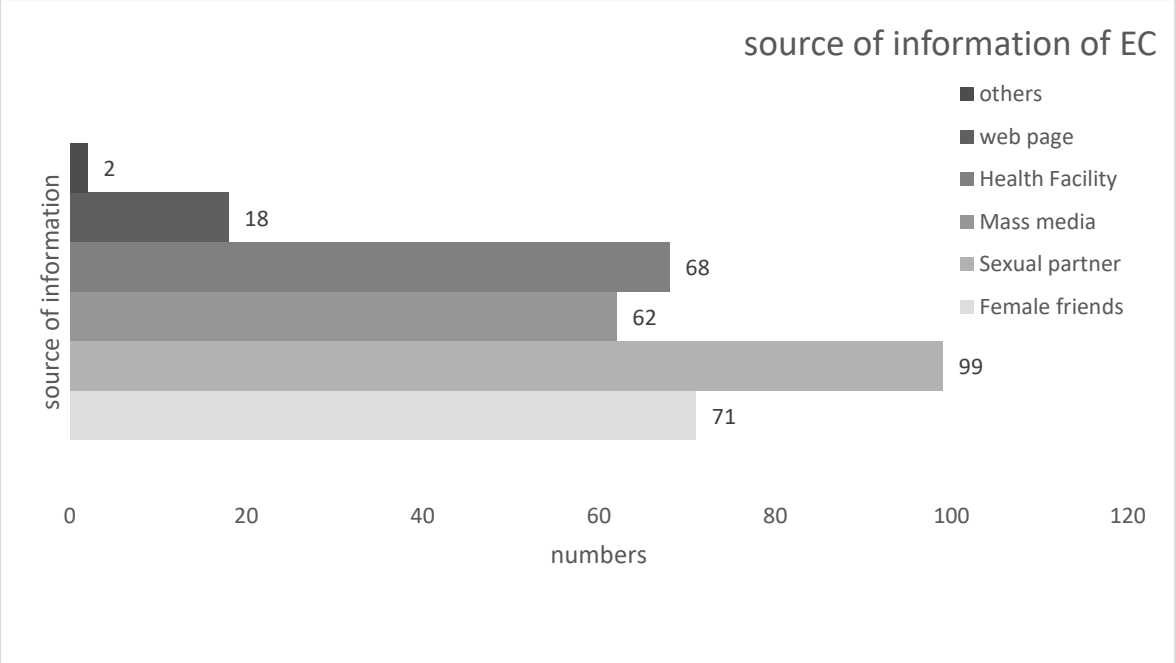


Figure 4: Source of information of EC

4.6 Factors Significantly Associated with Emergency Contraceptive use. [Tables 6 & 7 below].

4.6.1 Year of Study

A female student in third, fourth or fifth year of study were more likely to use Emergency Contraceptives compared to those in first year of study; Third year (aPR = 0.81, p = 0.009, 95% CI = 0.69-0.94), Fourth year (aPR = 0.77, p = 0.003, 95% CI = 0.65-0.92), Fifth year (aPR = 0.72, p = 0.001, 95% CI = 0.60-0.87).

4.6.2 Previous Use of Regular Contraceptives

Previous use of regular contraceptives exhibited a strong association with emergency contraceptive use (aPR = 1.23, p < 0.001, 95% CI = 1.11-1.37).

Table 6: Bivariable analysis for Factors Associated with EC

Variable	All	Emergency Contraceptive Use		
	N=415 (100.0%)	Yes N=174 (41.9%)	No N=241 (58.1%)	P-value
Age. Mean (standard deviation)	24.540 (4.798)	25.046 (4.142)	24.174 (5.198)	0.068
Year of study				
First year	110 (26.5%)	19 (10.9%)	91 (37.8%)	<0.001
Second year	101 (24.3%)	40 (23.0%)	61 (25.3%)	
Third year	150 (36.1%)	83 (47.7%)	67 (27.8%)	
Fourth year	46 (11.1%)	26 (14.9%)	20 (8.3%)	
Fifth year	8 (1.9%)	6 (3.4%)	2 (0.8%)	
Marital status				
Single	307 (74.0%)	120 (69.0%)	187 (77.6%)	0.059
Married	82 (19.8%)	44 (25.3%)	38 (15.8%)	
Divorced	14 (3.4%)	7 (4.0%)	7 (2.9%)	
Widowed	12 (2.9%)	3 (1.7%)	9 (3.7%)	
What is your religion?				
Orthodox	20 (4.8%)	7 (4.0%)	13 (5.4%)	0.023
Protestant	158 (38.1%)	75 (43.1%)	83 (34.4%)	
Muslim	46 (11.1%)	22 (12.6%)	24 (10.0%)	
Catholic	147 (35.4%)	61 (35.1%)	86 (35.7%)	
Others	44 (10.6%)	9 (5.2%)	35 (14.5%)	
Sexual history since joining campus?				
Yes	251 (60.5%)	162 (93.1%)	89 (36.9%)	<0.001
No	164 (39.5%)	12 (6.9%)	152 (63.1%)	
Average age at first sexual intercourse	20.496 (3.014)	20.335 (2.702)	20.793 (3.518)	0.255
Unprotected sexual intercourse history				
Yes	169 (67.9%)	115 (71.4%)	54 (61.4%)	0.104
No	80 (32.1%)	46 (28.6%)	34 (38.6%)	
Pregnancy from unprotected sexual intercourse?				
Yes	55 (32.7%)	31 (27.0%)	24 (45.3%)	0.019
No	113 (67.3%)	84 (73.0%)	29 (54.7%)	
Unintended pregnancy				
Yes	27 (50.9%)	14 (46.7%)	13 (56.5%)	0.477
No	26 (49.1%)	16 (53.3%)	10 (43.5%)	
Previous use regular contraceptive				
Yes	133 (53.8%)	108 (67.5%)	25 (28.7%)	<0.001
No	114 (46.2%)	52 (32.5%)	62 (71.3%)	

Table 7: Poisson multivariable regression analysis of Factors Associated with EC use

Variable	Emergency Contraceptive Use		
	P-value	aPR	95% Confidence Interval
Age of participants	0.085	1.01	1.00-1.02
Year of study			
First year	Reference	Reference	Reference
Second year	0.082	0.87	0.74-1.02
Third year	0.009	0.81	0.69-0.94
Fourth year	0.003	0.77	0.65-0.92
Fifth year	0.001	0.72	0.60-0.87
Marital status of participant			
Single	Reference	Reference	Reference
Married	0.206	1.10	0.95-1.27
Divorced	0.597	1.05	0.88-1.25
Widowed	0.787	0.95	0.67-1.35
Religion of participant			
Orthodox	Reference	Reference	Reference
Protestant	0.967	0.99	0.76-1.30
Muslim	0.868	0.98	0.74-1.29
Catholic	0.816	1.03	0.79-1.36
Others	0.235	1.19	0.89-1.60
Age of first sexual intercourse	0.457	1.01	1.00-1.02
If your response is YES, did you get pregnant?			
Yes	Reference	Reference	Reference
No	0.139	0.92	0.82-1.03
Use of regular contraceptive previously			
Yes	Reference	Reference	Reference
No	**<0.001**	1.23	1.11-1.37

CHAPTER FIVE: DISCUSSION

5.1 Introduction

The present study investigated the Prevalence and Factors Associated with Emergency Contraceptive use among Female Students of Gulu University. Overall, there was low level of EC use with less than half of participants having utilized emergency contraception since joining campus. Factors significantly associated with EC use were; year of study (that is being in Third, Fourth or Fifth year of study) and previous use of regular contraceptives.

5.2 Prevalence of emergency contraceptive use

This study found a low prevalence of Emergency Contraceptive use, that is 41%. This was consistent with many other studies done in other similar students settings such as (Nsubuga *et al*., 2016), which showed a contraceptive use prevalence of 46.3 % reported among female students of Makerere University in Uganda. Another report by (Kwame *et al*., 2022) on EC use prevalence in some African countries also showed low levels (ranging from 0% in DR Congo and Ethiopia to 54.1% in Nigeria). The reason for low EC use could be associated with lack of adequate knowledge negative attitudes, fear of side effects, religious barriers, desire for children, lack of partner support or myths like presumption of infertility following EC use.

In contrast, a study by (Barbian *et al*., 2021) among female University students at two universities in City of Santa Maria in Europe showed that the prevalence of EC use among undergraduates was above average, that is 52.9%. This could be associated with better socio-economic status, possible early exposure to information on EC with facilitates knowledge and attitude to proper use, more partner engagements, technological advancements and perhaps the higher standards of living which compel many young people to delay childbirth hence opting for EC use after coitus.

This study also found that the pill was the most used EC method, that is 79.9%, followed by IUCDs. This is in agreement with other studies such as the published study by (Adinma *et al.*, 2011) which

reported that Postinor 2 (levonorgestrel), EC pills such as Norlevo (levonorgestrel only) and Nodette (levonorgestrel and estradiol) were the most commonly used EC methods in Sub-Saharan Africa. Similar study findings were also observed by (Demissie *et al*., 2020) in a study in Ethiopia. Preference for EC pill use could possibly be due to being easier to use, affordable and more accessible compared to IUCDs.

5.3 Factors associated with emergency contraceptive use

Students' year of study was found to be associated with Emergency Contraceptive use, specifically being in third year, fourth year or fifth year. There was a decreasing trend in emergency contraceptive use across academic years, with a significant decline from the third to the fifth year. Similarly, high level of contraceptive knowledge did not translate into actual contraceptive use in this study. Variations in contraceptive practices among university students, are possibly influenced by changing attitudes, increased knowledge about other methods of preventing pregnancy, or altered risk perceptions as they progress in their academic journey. Similar findings were noted by (Kassebaum *et al*., 2014). In another report by (Awusabo-Asare *et al*., 2017), it was noted that comprehensive sexuality education programs that recognize that sexual activity can occur during adolescence, and seek to ensure the safety of such behaviour and equip students with the knowledge and ability to make informed choices, have demonstrated impact in improving knowledge, self-confidence and self-esteem positively changing attitudes, strengthening decision-making and increasing the use emergency contraceptives.

However, it should be noted that there are fewer university programs that normally run for more than 3years, for example there are only 4 for Gulu University – Bachelor of medicine and surgery, Bachelor of Law, Bachelor of Agriculture and biosystems engineering. These also have fewer students' population compared to humanities and social or business programs. This challenge

could have potentially confounded our study finding of mainly third year students being the bigger utilizers of EC.

There was also strong association between previous use of regular contraceptives and the likelihood of emergency contraceptive use. The participants who had not used regular contraceptives before demonstrated a significantly higher likelihood of resorting to emergency contraception. This aligns the interplay between contraceptive behaviors and decisions made in response to unexpected situations as cited by (Ganatra *et al*., 2017; Hounton *et a*l., 2015). This relationship was also observed in a related study by (Fikre *et al*., 2020) who noted that time of first sexual intercourse, previous use of regular contraceptives and history of being pregnant were major predictors for EC utilization among female students. These findings highlight the need for comprehensive sexual health education and family planning interventions that address both regular contraceptive methods and emergency options, ensuring a holistic approach to reproductive health on college campuses.

The major reasons for not using emergency contraceptive were; negative attitude towards emergency contraceptive, lack of knowledge on emergency contraceptive and religion not supporting its use. Similar findings were reported by (Abate *et al*., 2014) and (Byamugisha et al., 2006). In this study, only 43% women of the respondents correctly identified 72 hours as the time limit for the method use, it also indicated that less than a quarter of married women had knowledge towards EC and considerable number of women had inappropriate information about EC. In a similar study, only 62% respondents had appropriate knowledge about EC while less than half of respondents lack adequate information (Abate *et al*., 2014). These findings are also similar to those in the present study and another study conducted in Jimma (Admasu & Tebeje, 2009). The findings

of lack of accurate EC information also correlated with another study conducted in Kampala, Uganda by (Kivila, 2012), where a quarter of the respondents had inappropriate EC information.

In this study, the main source of information on emergency contraceptive was sexual partners followed by female friends. Similar findings were noted by (Le Guen *et al*., 2015), whose study noted that men's high awareness of contraceptive practices and their use increased their involvement in contraceptive use within the context of relationships. Friends were the second most common source of information on EC in the present study. This was similarly noted by (Chavuma *et al.*, 2010) , in a study carried out in Lusaka, Zambia where majority cited friends as a major source of information on EC. In contrast, another published article in Nigeria cited individual factors such as opposition from male partners as barriers for utilization of emergency contraception." (Adinma *et al*., 2011).

5.4 Strengths and limitations of the study

The study design and setting made it easy for the study to be conducted quickly and inexpensively. This cost effectiveness afforded us the opportunity to recruit a larger number of study participants and collected data on several variables.

The larger number of participants and almost 100% response rate from the 415 participants improved the validity and hence statistical inferences can be easily applied to other populations with similar characteristics and setting.

The cross-sectional nature of the research design restricts our ability to establish causal relationships between the identified factors and emergency contraceptive use. Data was collected at a single point in time hence may not capture the dynamic nature of individuals' attitudes and behaviors over time.

Additionally, the study relied on self-reported responses, which may be subject to recall bias or social desirability bias, potentially influencing the accuracy of participants' accounts of their contraceptive behaviors.

The generalizability of the findings is constrained by the specific context of the university setting, and caution should be exercised when applying these results to broader populations.

Our tool did not capture details for those not sexually active as all participants had been assumed to be sexually active. Same for those who got condom breaks or missed pills. These would have benefited from sorted analysis.

To mitigate these limitations, future research could employ a longitudinal study design, incorporate qualitative methods for a more in-depth understanding, and expand the study's scope to encompass diverse populations. Efforts were made to ensure confidentiality and anonymity, and the survey design aimed to minimize biases by utilizing standardized questions and response options.

5.5 Implications of study findings

5.5.1 Implications to the students and public health

The observed decline in emergency contraceptive use as academic years progress highlights a critical need for targeted sexual health education programs, emphasizing the availability, effectiveness, proper timing and proper utilization of emergency contraception.

The association of emergency contraceptive use with prior regular contraceptive use underscores the importance of comprehensive family planning initiatives on university campuses. Implementing accessible and inclusive sexual health services, coupled with educational campaigns that address misconceptions and promote informed decision-making, can empower students to make healthier choices.

Public health interventions, informed by these findings, should focus on tailoring strategies to university populations, recognizing the unique factors influencing contraceptive use decisions. Such initiatives can contribute to reducing unintended pregnancies, improving reproductive health outcomes, and fostering a supportive and informed community.

5.5.2 Implications to the University

University managements should consider implementing comprehensive sexual health programs that are not only accessible, but also address the evolving needs and knowledge gaps of students as they progress through their academic journey. This could be done through workshops, seminars, and awareness campaigns focused on responsible sexual behavior, family planning, and the correct usage of contraceptives.

Additionally, collaborations with other partners providing sexual and reproductive health services can facilitate easy access to contraceptives and information. Understanding the factors influencing contraceptive decisions among students can guide the development of tailored resources and support systems that contribute to a healthier and more informed campus community.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Overall, there was low level of Emergency Contraceptive use with less than half of participants having utilized emergency contraception since they joined campus. Factors significantly Associated with Emergency Contraceptive use were year of study and previous use of regular contraceptives.

6.2 Recommendations

- Health and sexual reproductive health education Interventions should be designed to target specific academic years, recognizing the evolving needs and knowledge levels of students over time. Public health campaigns should prioritize dispelling misconceptions about emergency contraception and promoting comprehensive family planning education that encompasses both regular and emergency contraceptive methods.
- Review of the teaching curriculums to include course units on sexual and reproductive health education at the university, for all faculties, and ensuring that female students have access to accurate and comprehensive information from trusted sources, such as healthcare providers or university health services.
- Improve the availability, accessibility, and affordability of regular contraceptive methods on campus and to encourage their consistent use. This will in turn reduce the need for emergency contraceptive use.
- A broader study to investigate the specific barriers and challenges faced by female students in accessing and using emergency contraceptives should be carried out. Implement strategies to address these barriers, such as improving knowledge, religious bias, reducing stigma, or enhancing the availability of emergency contraceptives on campus.

- Consider a longitudinal research approach to capture the changes in emergency contraceptive use and the factors influencing it over time. Additionally, explore a more comprehensive, mixed-methods approach that combines quantitative and qualitative data to provide a deeper understanding of the issue.

REFERENCES

Abate, M., Assefa, N., & Alemayehu, T. (2014). Knowledge, attitude, practice, and determinants emergency contraceptive use among women seeking abortion services in Dire Dawa, Ethiopia. *PloS One*, *9*(10), e110008. https://doi.org/10.1371/journal.pone.0110008

Abrha, A. M., Nigus, H. K., Weldetnsae, B. G., Tilahun, M., Nigusse, A. G., & Deribew, K. T. (2017). Effects of human disturbances on two sympatric francolin species in the Central Highlands of Ethiopia. *Journal Homepage: Www. Wesca. Net*, *12*(1).

Adinma, E. D., Adinma, J. I. B., Ugboaja, J., Iwuoha, C., Akiode, A., Oji, E., & Okoh, M. (2011). Knowledge and perception of the Nigerian Abortion Law by abortion seekers in south-eastern Nigeria. *Journal of Obstetrics and Gynaecology*, *31*(8), 763–766. https://doi.org/10.3109/01443615.2011.593645

Admasu, A., & Tebeje, B. (2009). Knowledge, attitudes, practices and barriers to use emergency contraception among women with unsafe abortion in Jimma Marie Stops Clinic, South West Ethiopia. *Ethiopian Journal of Reproductive Health, Addis Ababa*, *3*.

Alobo, G., Reverzani, C., Nahurira, V., & Sarno, L. (2022). Septic shock, acute renal and liver failure following unsafe abortion using bitter leaves and wandering jew in northern Uganda: A case series. *Clinical Case Reports*, *10*(6), e5975. https://doi.org/10.1002/ccr3.5975

Awusabo-Asare, K., Stillman, M., Keogh, S., Doku, D. T., Kumi-Kyereme, A., Esia-Donkoh, K., Leong, E., Amo-Adjei, J., & Bankole, A. (2017). *From paper to practice : Sexuality education policies and their implementation in Ghana*. https://researchportal.tuni.fi/en/publications/from-paper-to-practice-sexuality-education-policies-and-their-imp

Barbian, J., Kubo, C. Y., Balaguer, C. S., Klockner, J., da Costa, L. M. V., Ries, E. F., & Bayer, V. M. L. (2021). Emergency contraception in university students: prevalence of use and knowledge gaps. *Revista de Saúde Pública*, *55*, 74. https://doi.org/10.11606/S1518-8787.2021055003076

Bearak, J., Popinchalk, A., Ganatra, B., Moller, A. B., Tunçalp, Ö., Beavin, C., Kwok, L., & Alkema, L. (2020). Unintended pregnancy and abortion by income, region, and the legal status of abortion: estimates from a comprehensive model for 1990–2019. *The Lancet Global Health*, *8*(9), e1152–e1161. https://doi.org/10.1016/S2214-109X(20)30315-6

Byamugisha, J. K., Mirembe, F. M., Faxelid, E., & Gemzell-Danielsson, K. (2006). ORIGINAL ARTICLES Emergency Contraception and Fertility awareness among University Students in Kampala, Uganda. *African Health Sciences*, *6*(4), 194–200.

Chavuma, N. C., Chanda, D. O., & Vwalika, B. (2010). Emergency contraception among women with abortion at University Teaching Hospital in Lusaka, Zambia. *Medical Journal of Zambia*, *37*(4), 240–245.

Darteh, E. K. M., & Doku, D. T. (2016). Knowledge and Usage of Emergency Contraceptives Among University Students in Ghana. *Journal of Community Health*, *41*(1), 15–21. https://doi.org/10.1007/S10900-015-0057-6

Demissie, T. W., Nigatu, A. M., & Beyene, G. M. (2020). Assessment of emergency contraceptives utilization and associated factors among female college students at Debre Tabor town. *Contraception and Reproductive Medicine*, *5*(1). https://doi.org/10.1186/s40834-020-00139-0

Diniz, D., Medeiros, M., & Madeiro, A. (2017). National abortion survey 2016. *Ciencia e Saude Coletiva*, *22*(2), 653–660. https://doi.org/10.1590/1413-81232017222.23812016

Dowling, K., Martin, R., Florentine, S. K., & Pearce, D. C. (2021). Ensure Healthy Lives and Promote Well-Being for All At All Ages. *Sustainable Development Goals Series*, *Part F2658*, 53–80. https://doi.org/10.1007/978-3-030-38815-7_3

Engel, D. M. C., Paul, M., Chalasani, S., Gonsalves, L., Ross, D. A., Chandra-Mouli, V., Cole, C. B., de Carvalho Eriksson, C., Hayes, B., & Philipose, A. (2019). A package of sexual and reproductive health and rights interventions—what does it mean for adolescents? *Journal of Adolescent Health*, *65*(6), S41–S50.

Fikre, R., Amare, B., Tamiso, A., & Alemayehu, A. (2020). Determinant of emergency contraceptive practice among female university students in Ethiopia: systematic review and meta-analysis. *Contraception and Reproductive Medicine*, *5*(1), 1–9. https://doi.org/10.1186/s40834-020-00123-8

Ganatra, B., Gerdts, C., Rossier, C., Johnson, B. R., Tunçalp, Ö., Assifi, A., Sedgh, G., Singh, S., Bankole, A., Popinchalk, A., Bearak, J., Kang, Z., & Alkema, L. (2017). Global, regional, and subregional classification of abortions by safety, 2010–14: estimates from a Bayesian hierarchical model. *The Lancet*, *390*(10110), 2372–2381. https://doi.org/10.1016/S0140-6736(17)31794-4

Gemzell-Danielsson, K., Kopp Kallner, H., & Faúndes, A. (2014). Contraception following abortion and the treatment of incomplete abortion. *International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics*, *126 Suppl*, S52-5. https://doi.org/10.1016/j.ijgo.2014.03.003

guttmacher institution. (2017). *Abortion and Postabortion Care in Uganda*. *February*, 49–50. https://doi.org/10.1371/journal.pone.0165812.Additional

Hakim, A. J., Ogwal, M., Doshi, R. H., Kiyingi, H., Sande, E., Serwadda, D., Musinguzi, G., Standish, J., & Hladik, W. (2022). At the intersection of sexual and reproductive health and HIV services: use of moderately effective family planning among female sex workers in Kampala, Uganda. *BMC Pregnancy and Childbirth*, *22*(1). https://doi.org/10.1186/s12884-022-04977-5

Hounton, S., Barros, A. J. D., Amouzou, A., Shiferaw, S., Maïga, A., Akinyemi, A., Friedman, H., & Koroma, D. (2015). Patterns and trends of contraceptive use among sexually active adolescents in Burkina Faso, Ethiopia, and Nigeria: evidence from cross-sectional studies. *Global Health Action*, *8*(1), 29737.

Indraccolo, U., Castigliego, A. C., Di Iorio, R., Favilli, A., Greco, P., Fedeli, P., & Indraccolo, S. R. (2020). Knowledge and availability of the emergency contraceptive pills: an Italian women

survey. *Clinical and Experimental Obstetrics & Gynecology*, *47*(1), 93–98.

Kassa, G. M., Arowojolu, A. O., Odukogbe, A. A., & Yalew, A. W. (2018). Prevalence and determinants of adolescent pregnancy in Africa: A systematic review and Meta-analysis. In *Reproductive Health* (Vol. 15, Issue 1). https://doi.org/10.1186/s12978-018-0640-2

Kassebaum, N. J., Bertozzi-Villa, A., Coggeshall, M. S., Shackelford, K. A., Steiner, C., Heuton, K. R., Gonzalez-Medina, D., Barber, R., Huynh, C., & Dicker, D. (2014). Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, *384*(9947), 980–1004.

Kaye, D. K., Kakaire, O., Nakimuli, A., Osinde, M. O., Mbalinda, S. N., & Kakande, N. (2014). Male involvement during pregnancy and childbirth: men's perceptions, practices and experiences during the care for women who developed childbirth complications in Mulago Hospital, Uganda. *BMC Pregnancy and Childbirth*, *14*(1), 1–8.

Kivila, K. S. (2012). Knowledge, attitudes and practices regarding emergency contraceptive pills among female undergraduate students of Makerere University, Uganda. *Contraception*, *85*(3), 323–324.

Kumari, K., Memon, S., Bhutta, S. Z., & Jamelle, R. N. (2016). Hazards of Unsafe Abortions in the Past and Present-A Continuing Dilemma and a Preventable cause of Maternal Mortality. *Journal of Liaquat University of Medical & Health Sciences*, *15*(1).

Kwame, K. A., Bain, L. E., Manu, E., & Tarkang, E. E. (2022). Use and awareness of emergency contraceptives among women of reproductive age in sub-Saharan Africa: a scoping review. *Contraception and Reproductive Medicine*, *7*(1), 1–14. https://doi.org/10.1186/s40834-022-00167-y

Lackritz, E. M., Wilson, C. B., Guttmacher, A. E., Howse, J. L., Engmann, C. M., Rubens, C. E., Mason, E. M., Muglia, L. J., Gravett, M. G., & Goldenberg, R. L. (2013). A solution pathway for preterm birth: accelerating a priority research agenda. *The Lancet Global Health*, *1*(6), e328–e330.

Le Guen, M., Ventola, C., Bohet, A., Moreau, C., & Bajos, N. (2015). Men's contraceptive practices in France: evidence of male involvement in family planning. *Contraception*, *92*(1), 46–54. https://doi.org/10.1016/j.contraception.2015.03.011

Maly, C., McClendon, K. A., Baumgartner, J. N., Nakyanjo, N., Ddaaki, W. G., Serwadda, D., Nalugoda, F. K., Wawer, M. J., Bonnevie, E., & Wagman, J. A. (2017). Perceptions of adolescent pregnancy among teenage girls in Rakai, Uganda. *Global Qualitative Nursing Research*, *4*, 2333393617720555.

Ministry of Health Uganda. (2023). *Annual Health Sector Performance Report- FY 2022/23*. 228. http://health.go.ug/

Nigus, C., & Tilahun, B. (2017). Emergency contraceptive use and associated factors among undergraduate female students in Wollo University, Dessie, Ethiopia. *Journal of Public Health and Epidemiology*, *9*(10), 272–278. https://doi.org/10.5897/jphe2017.0968

Nsubuga, H., Sekandi, J. N., Sempeera, H., & Makumbi, F. E. (2016). *Contraceptive use, knowledge, attitude, perceptions and sexual behavior among female University students in Uganda: a cross-sectional survey*. https://doi.org/10.1186/s12905-016-0286-6

Nyambura, M. G., Kiarie, J. N., Orang'o, O., & Okube, O. T. (2017). Knowledge and Utilisation of Emergency Contraception Pills among Female Undergraduate Students at the University of Nairobi, Kenya. *Open Journal of Obstetrics and Gynecology*, *07*(09), 989–1005. https://doi.org/10.4236/OJOG.2017.79100

Olukayode, A. O., & Amos, I. O. (2018). Factors Influencing Non-Utilization of Modern Methods of Family Planning Among Couples in Paikon-Kore,(FCT) Nigeria. *Covenant Journal of Business and Social Sciences*.

Santos, O. A. dos, Borges, A. L. V., Chofakian, C. B. do N., & Pirotta, K. C. M. (2014). Determinants of emergency contraception non-use among women in unplanned or ambivalent pregnancies. *Revista Da Escola de Enfermagem Da USP*, *48*, 16–22.

Sserwanja, Q., Musaba, M. W., & Mukunya, D. (2021). Prevalence and factors associated with modern contraceptives utilization among female adolescents in Uganda. *BMC Women's Health*, *21*(1), 61. https://doi.org/10.1186/s12905-021-01206-7

Sunguya, B. F., Zhu, S., Mpembeni, R., & Huang, J. (2019). Trends in prevalence and determinants of stunting in Tanzania: an analysis of Tanzania demographic health surveys (1991–2016). *Nutrition Journal*, *18*(1), 1–13.

Uganda Bureau of Statistcs (UBOS), & ICF. (2017). Uganda Demographic and Health Survey 2016: Key Indicators Report. Kampala, Uganda. *UBOS, and Rockville, Maryland, USA*.

Winfrey, W., & Rakesh, K. (2014). Use of Family Planning in the Postpartum Period. *DHS Comparative Reports No. 36*, *September*.

Woog, V. (2013). *Unsafe abortion in Tanzania: a review of the evidence*.

APPENDIX I:

Measures for the Prevention and control of risk of spread of COVID-19 during the implementation of research.

Study Title: Prevalence and Factors associated with emergency contraceptive use among Female students of Gulu University.

Principal Investigator: Mukembo Robert

Introduction:

The novel Coronavirus is transmitted from human to human through droplets and direct or close personal contact with an infected individual. Novel Coronavirus signs of infection include respiratory symptoms, fever, cough, shortness of breath, and breathing difficulties. In more severe cases, the infection can cause pneumonia, severe acute respiratory syndrome, kidney failure, and even death.

Implementation of the prevention and control measures

In the implementation of the research activities, i commited to ensure the safety of the research team, research participants, and communities where the study will be conducted. The study team undertook to comply with the Standard Operating Procedures issued by the Ministry of Health, and presidential directives to mitigate against the risk of infection of COVID-19.

Procedures to followed during the implementation of the research.

A. Prior to data collection and training

1. **Health guidance:** There was sensitization and awareness, to equip the research team and participants with knowledge of signs and symptoms of the COVID-19, and preventive measures such as hand hygiene before placing and removing the mask, as well as storage of the mask, social distancing.
2. **Wearing face coverings:** All researchers and research assistants and any other individuals engaged in research activities that require interaction with fellow researchers or research participants or the community members wore a face mask that fully covers the mouth and nose in the situations required by the Health Ministry guidance. The study will provide face masks for individuals who do not have them.

3. **Physical Distancing:** There was a reasonable social distance during the training, meetings, community outreach.
4. **Good hygiene:** All team members were required to wash their hands or use hand sanitizers regularly. Hand washing equipment shall be always supplied and made available. All surfaces and equipment shall be sanitized frequently.

B. During data collection

1. **Personal Protective Equipment (PPE):** All research assistants involved in tracing of respondents and in in-person interviews and research participants used a properly fitted face mask. Enumerators/Researchers and research participants used hand sanitizers prior to the interview. Handshakes and hugging was prohibited.
2. **Consent Process:** The researcher assistants observed reasonable social distancing when taking consent upon arrival to the participant. Researchers and research participants used hand sanitizer prior to the interview. As indicated in the informed consent form, participants were sensitized on COVID-19 and presented with preventive measures.

C. During Dissemination/Community engagement

1. **Community Engagement:** Researchers and research participants will wear masks, wash hands with soap and water or use hand sanitizer prior to the event.
2. **Equipment sanitization:** Shared devices used during community engagements shall be sanitized regularly.

These preventive measures will be continuously reviewed based on new information and guidelines communicated by the Ministry of Health.

APPENDIX II: COMMUNITY ENGAGEMENT PLAN

STUDY TITLE: PREVALENCE AND FACTORS ASSOCIATED WITH EMMERGENCY CONTRACEPTIVE USE AMONG FEMALE STUDENTS OF GULU UNIVERSITY.

Principle Investigator: Mukembo Robert

Rationale of the study

The findings from this study will have both theoretical and practical benefits including providing essential data on the gaps on EC use among Gulu university students. The findings may also be used to plan interventions to scale up emergency contraceptive use, and other family planning methods so as to prevent unwanted pregnancies, unsafe abortions and schools dropouts among female university students.

Furthermore, the study findings may be used to inform the health policy makers and implementers on the needs for special consideration of University students in family planning and population control programs. Effective government policies need to be enacted and implemented to ensure that there are different mechanisms of ensuring availability of reproductive health and contraceptive services (including emergency contraceptives) to youths (and students) in all health centres.

The study will also explore the need to establish or activate SRH clinics in Universities and Tertiary institutions health facilities. Furthermore, it will contribute to the existing literature on emergency EC use among the youths and students. Knowledge obtained from the study will also be used to create public awareness on the importance of EC use by University students.

General objective and specific objectives to be achieved.

Generally, this study aims to determine the prevalence and factors associated with emergency contraceptive use among female students (aged 18-49years) of Gulu University, Uganda. Specifically, the study will determine: the proportion of female students using emergency contraceptives among female students of Gulu University, factors associated with emergency contraceptive use and determine if male partner involvement affects utilization and choice of EC method.

The community engagement will aim to;

To sensitize the community and the stakeholders about the nature of the research and receive real time feedback.

Provide clarity on the respective roles and responsibilities of the stakeholders involved in the study before, during and after the study.

Address key ethical concerns of the research. These will include the benefits of the study to the affected community so that the community appreciates the value of the research, the consenting processes prior to the research and the rights of the participants.

The key community stakeholders to be involved:

The stakeholders to be engaged are as in the table below.

We will maintain constant engagement of stakeholders throughout the duration of research,

The research team responsible for managing community engagement activities

S/N	Research Team	Technical abilities	Tasks/lead roles
1	Principal investigator	Trained and skilled health worker with sufficient knowledge of EC.	Will lead the research team, coordinate and oversee the implementation of the Community engagement plan
2	Research assistants	Good knowledge about data to be collected	Will engage participants and help them with answering the questionnaires.

Approaches, activities and mode of implementation

The approach to community engagement will involve formative consultations, existing community structures and community events as follows;

Formative Consultations: I will use formative consultations to understand the geographical nature of the areas, socio-cultural norms and practices, power influences, local perceptions of the target population related to the study. This will be undertaken through field visits to the study areas to

gain sufficient familiarity with the geographical characteristics and livelihood activities. I will also visit the University administration offices to gain sufficient knowledge of the governance structures and to obtain demographic characteristics of the areas, and populations among whom we intend to conduct research.

Community Stakeholders' Partnerships: Gaining community entry will require effective engagement of the community structure and stakeholders as follows;

S/N	Stakeholders	Roles/Involvement
1	Gulu City RCC	permission to conduct research
2	Gulu University Administration	Permission to conduct the research and to access- the study participant
3	Dean of students' office	Permission to access the study participants
4	Deans of faculties and lecturers	Permission to access the study participants
5	Students	Consent to participate in the study

Community events such as community meetings, workshops, seminars and community outreaches to sensitize communities and the stakeholders in the study areas about the study and obtain feedback in real time. Discussions will Centre around; a) Knowing overall community concerns as they try to explain about Emergency contraception and effects of unplanned pregnancies like abortions and school dropout b) Obtain community support for taking actions that will help them with addressing issues surrounding EC use. Participants will participate by voicing their opinions, criticisms, or experiences.

Communication strategy for the engagement

Communication between the research team and the stakeholders will be conducted throughout the study period.

Prior, to the consultative meetings, we will contact the with the University authorities by phone for an appointment for a meeting. During the meeting, the subject matter will be introduced and during

the discussion, i will take notes and record the meeting proceedings which will be reviewed later on. Extracts of the meeting will then be used to enrich and improve the research undertaking.

For the workshops and seminar events, we will notify the University authorities, Student Guild leadership and CHO of the date of the workshop in their area. They will be requested to mobilize the selected participants to attend the workshop. The workshop venue will be located within the University premises. The meetings will be conducted in a language that is understood by the participants, and proceedings will be documented for review and appropriate use to improve and enrich the research.

Considering that the engagement will also include sharing the research results, we will project results and share soft copies of the findings to the participants during the workshops to share results of the research findings, challenges encountered and steps taken to address them, lessons learned and recommendations.

Plan on mitigation of risks and conflicts:

Risks and conflicts might arise before, during or after the conduct of research. The risks and conflicts have the potential to affect the research and the research outcomes. If they occur, they will be addressed as soon as they are detected. GUREC and UNCST will be notified of risks and conflicts of adverse nature. We anticipate the following risks and conflicts;

There is the risk of the spread of covid-19 virus which is still a global and national health concern.

APPENDIX III: PROPOSED BUBGET

ITEM	NUMBER	UNIT COST/SHS	TOTAL/SHS
Questionnaires	420	5000	2,100,000
Flash discs/data sticks	3	100,000	300,000
Research assistants	10	100,000	500,000
Communication			200,000
Printing services: Proposal Dissertation	 2 4	 30,000 50,000	 60,000 200,000
Internet			100.000
Stationery Note books Pens	 20 2 BOXES	 5000 20,000	 100,000 40,000
Refreshments and feeding			500,000
Miscellaneous			500,000
Total			4,600,000

Budget justification:

Questionnaires: 400 questionnaires for collection of data will be printed.

Stationery: notebooks and pens will be required by the researcher and research assistants for tallying collected data for analysis

Secretarial services: This will include costs for printing and binding of the proposal and the final dissertation booklets

Research assistants: I will hire 10 research assistants to help us in data collection.

Communication: this will cater for transport and airtime that will be used by the researcher and the research assistants during the study.

Internet and flash disc: collection of literature for this research will be done using internet services. I will buy a modem and flash disks for the storage of data.

Refreshment and feeding: this will cater for the welfare of the researcher, research assistants and the study participants (a bottle of soda or mineral water will be given) during period of data collection.

Miscellaneous: this will cater for unforeseen expenses and extra expenses that might occur dung the course of the study.

APPENDIX IV: WORK PLAN

Activity	MAY-JUN 2023	AUGUST 2023	SEPT – OCTR 2023	OCT – NOV 2023	NOV 2023 - FEB 2024	MARCH-MAY 2024	JUNE – AUGUST 2024	SEPT - DEC 2024
1.Proposal development								
2.Proposal submission and corrections								
3.Data collection								
4.Data completion								
5.Data analysis								
6.Report writing and defense								
7. corrections and Report submission								

APPENDIX V: Consent form

Title of the study: Prevalence and factors associated with Emergency contraceptive use among female students of Gulu University, Uganda,

Investigator: Mukembo Robert

Institution: Gulu University

Introduction

You are invited to participate in a research study conducted by **Mukembo Robert,** a student of masters of Public Health, Gulu University. The purpose of this research is to explore the University students' use of emergency contraception and the factors associated with use. The findings of this study will help to inform policy to address gaps in utilisation of emergency contraceptives and challenges of use.

Your participation in this study will involve truthfully answering the questionnaire that you will be given after consenting.

You have been chosen to participate in this study because you are female students of Gulu University in reproductive years, 18-49ys and hence are eligible to participate. This study will take approximately 1month and will involve about 400 participants.

Risks/discomforts:

There are no known risks associated with this research although certain questions relate to the socially sensitive topics of sexual activity, and contraceptive practices. I encourage you to talk to the University Counsellor if there is anything like psychological problem you would like to further discuss after answering the questionnaire.

Potential Benefits

The results of this study will help to bridge the utilization gaps on Emergency contraceptive methods among Gulu University students. It will help in addressing the increasing needs of emergency contraception like protection from unwanted pregnancy and its complications like abortions, protection from STIs and reducing University dropout due to unplanned pregnancies.

Confidentiality:

Your identity will not be revealed to any one as we shall only use codes to identify participants. Information obtained will only be accessible by the research team. Soft copies of the data will be protected by password and hard copy files will be kept under lock and key. Confidential information will only be accessed by the principal investigator.

Alternatives:

You do not have to participate in this study if you are not interested. You will not lose any benefit in case of no participation.

Cost:

There will not be any additional cost incurred as a result of participating in this study.

Questions:

If you have any questions related to the study as a research participant, you can contact the principal investigator, Dr. Mukembo Robert on 0783434434 or via email on mukembo.robert@gmail.com.

Statement of voluntariness:

Participation in the research study is voluntary and you may join on your own free will. You have a right to withdraw from the study at any time without penalty.

If you have any issues pertaining to your rights and participation in the study, please contact the Chairperson, Gulu University Research Ethics Committee, Dr. Gerald Obai Tel: No., 0772305621; email: lekobai@yahoo.com/lekobai@gmail.com; or the Uganda National Council for Science and Technology, on plot 6 Kimera road, Ntinda, Kampala on Tel 0414705500.

Statement of consent

..... has described to me what is going to be done, the risks, the benefits involved and my rights as a participant in this study. I understand that my decision to participate in this study will not affect me in any way. In the use of this information, my identity will be concealed. I am aware that I may withdraw at any time. I understand that by signing this form, I do not waive any of my legal rights but merely indicate that I have been informed about the research study in which I am voluntarily agreeing to participate. A copy of this form will be provided to me.

Name ……Signature of participant……Date ……

Name…… Signature of interviewer……Date……

APPENDIX VI: QUESTIONNAIRE

Introduction

Dear participant, this questionnaire is prepared to assess for Prevalence and factors associated with utilization of Emergency Contraception among female students of Gulu University. It contains five sections namely, socio-demographic section, sexual and reproductive history section, Emergency Contraception knowledge assessment section, Emergency Contraception attitude assessment section and Emergency Contraception practice assessment.

The ultimate purpose of this study is to assess for prevalence and identify those factors associated with utilization of Emergency Contraception among female students of Gulu University. The findings of this study will help to develop appropriate strategies for improving utilization and inform policy to address any identified challenges. To attain this, aim your honest and genuine participation is very important and highly appreciable.

I therefore, kindly request you to fill this questionnaire as accurately and carefully as possible. Please, be assured that all the information gathered will be kept strictly confidential and you do not need to write your name or any special identification that might disclose who you are, on any of the questionnaire page.

Thanks for your honest and genuine participation!

SECTION I- SOCIO- DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Dear participants, this section assess some of your socio-demographic feature like age, marital status and so on. It consists of six items. For close ended questions, please encircle your response among the provided alternatives. If your response is not included among the provided alternatives, write your responses on the space provided under "***if other specify***" option. For open ended items write your response precisely & clearly on the space provided for each item.

ITEM CODE	QUESTION	POSSIBLE RESPONSES	SKIP
SD101	How old are you? (Age in completed years)	----------	
SD102	Which year of study are you attending now?	1. First year 2. Second year 3. Third year 4. Fourth year 5. Fifth year	
SD103	Which field of study are you attending now? (your field of study)	----------	
SD104	What is your current Marital status?	1. Single 2. Married 3. Divorced 4. Widowed	
SD105	Which religious group are you following?	1. Orthodox 2. Protestant 3. Muslim 4. Catholic 99. If Other (specify)--------- ----------	
SD106	What is your ethnic group?	1. Acholi 2. lango 3. muganda 4. musoga 5. itesot 6. munyankore/mukiga 7. munyoro/mutoro 8. mugisu 99. If other (specify) ---------- ----------	

SECTION - II - RESPONDENTS SEXUAL AND REPRODUCTIVE HISTORY

Dear participants, section two assess some of your sexual and reproductive history and it consists six items. For close ended questions, please encircle your response among the provided alternatives. If your response is not included among the provided alternatives write your responses on the space provided under "***if other specify***" option. For open ended items write your response on the precisely & clearly on the space provided for each item. Please, ensure that you are following the skip rule column for items that needs to be jumped while filling each item.

ITEM CODE	QUESTION	POSSIBLE RESPONSES	SKIP
SR201	Have you ever had sex since you joined this campus?	1. Yes 2. No	If No → **KG301**
SR202	If your response is **YES** for item code. **SR201**, what was your age during the first sexual intercourse?	----------	
SR203	Have you ever had Unprotected sexual intercourse since you joined this campus?	1. Yes 2. No	If No → **SR206**
SR204	If your response is **YES** for item code. **SR203** did you get pregnant?	1. Yes 2. No	If No → **SR206**
SR205	If your response is **YES** for item code. **SR204** was it Unintended pregnancy?	1. Yes 2. No	
SR206	Have you ever used any regular contraceptive previously?	1. Yes 2. No	

SECTION - III - RESPONDENTS KNOWLEDGE ASSESSMENT QUESTIONS ON EMERGENCY CONTRACEPTION

Dear participants, this section assess your knowledge about emergency contraception. It consists eight items. For each item the possible alternatives are provided please, encircle your response among the provided alternatives. For items that might have more than one response you can encircle multiple possible alternatives.

ITEM CODE	QUESTION	POSSIBLE RESPONSES	SKIP
KG301	Where do you think emergency contraception could be obtained?	1. Pharmacy/ Health facility 2. Any shops 77.I don't know	
KG302	Which one of these drugs can be used for emergency contraception?	1. Combined oral contraceptive 2. Progesterone only pills & IUCD 3. Anti-biotic like ampicillin 77.I don't know	
KG303	When taken early, emergency contraception prevents sexually transmitted infections	1. Yes 2. No 77.I don't know	
GK304	Situation(s) that emergency contraception should be taken (***more than one answer could be possible***)	1. If condom ruptured during intercourse 2. When there is a missed pill 3. When forced to have sex/raped 4. When there is failure of contraception 77.I don't know	
GK305	What is the maximum recommended time limit to take emergency contraception Pills?	1. Within 24 hours after sex 2. Within 72 hours after sex 3. Within 5 days after sex 77.I don't know	
KG306	How much do you think is the effectiveness of emergency contraception Pills in preventing pregnancy?	1. Highly effective (>95%) 2. Effective (75-89%) 3. Less effective (<10%) 4. Not effective at all 77.I don't know	

KG307	What the recommended number is of doses of emergency contraception Pills?	1. One dose 2. Two doses 3. Three doses 77.I don't know	
KG308	What is the recommended time interval between the doses of emergency contraception Pills?	1. 12 hours apart 2. 24 hours apart 3. 72 hours apart 77.I don't know	

SECTION –IV - RESPONDENTS ATTITUDE ASSESSMENT QUESTIONS TOWARDS EC

Dear participants, this section assess your attitude towards emergency contraception. It consists eight items having five Likert scale alternatives. For each item five Likert scale alternatives are provided from "strongly agree" to "strongly disagree" please, encircle one of your response among the provided alternatives.

ITEM CODE	QUESTION	POSSIBLE RESPONSES	SKIP
AT401	Provision of Emergency contraception after unsafe sexual intercourse can prevent unwanted pregnancy	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
AT402	All females have the right to access EC.	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
AT403	Emergency contraception promotes promiscuity	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
AT404	Emergency contraception may hurt the baby in case it does not work	1. Strongly agree 2. Agree	

		3. Neutral 4. Disagree 5. Strongly Disagree	
AT405	Using Emergency contraception to prevent unintended pregnancy is one way of abortion	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
AT406	Using Emergency contraception to prevent unintended pregnancy is a sinful act	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
AT407	Using Emergency contraception may cause infertility in a woman	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	
AT408	Emergency contraception will affect ongoing regular methods of contraception negatively	1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree	

SECTION - V - RESPONDENTS EXPERIENCE OF EC

Dear participants, this section assess your experience of emergency contraception utilization. It consists four items. This section should only be filled by respondents who had sexual contact history since they joined campus. For each item the possible alternatives are provided please, encircle your response among the provided alternatives. If your response is not included among the provided alternatives, write your responses on the space provided under "***if other specify***" option. For items that might have more than one response, you can encircle multiple possible alternatives. Please, ensure that you are following the skip rule column for items that needs to be jumped while filling each item.

ITEM CODE	QUESTION	POSSIBLE RESPONSES	SKIP
EP501	Have you ever used emergency contraceptive since you joined this campus?	1. Yes 2. No	If No→ **EP504**
EP502	If your response is **YES** for item code **EP501** Which methods did you used?	1. Emergency contraception Pills 2. IUCD	
EP503	If your response is **YES** for item code **EP501,** where did you get the information? (***more than one response could be possible***)	1. Female friend 2. Sexual partner 3. Mass media 4. Health professional /facility 5. Web pages 99. If other (specify)----------	
EP504	If your response is **NO** for item code **EP501** what was the reason for not using EC? (***More than one response could be possible***)	1. Lack of knowledge about ECs 2. Fear of being seen by other 3. Inconvenient service delivery 4. Opposition from partner to use condom 5. Negative attitude towards EC 6. Wanted to be pregnant 7. My partner refused me to use 8. My religion doesn't support it 9. I don't think it is effective 99. If other(specify)----------	