

Thesis for doctoral degree (Ph.D)
2007

EMERGENCY CONTRACEPTION AMONG YOUNG PEOPLE IN UGANDA

User and provider perspectives



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**Karolinska
Institutet**

Kampala and Stockholm 2007

The photo on the front page of this thesis is from a long time ago, in the Kigezi region of Uganda. It was abominable for a young girl to conceive before getting married. If a girl got pregnant she would be taken by her brother or close relative, usually a male, and be thrown down into this waterfall called Kisiizi—as a punishment. One time, a girl who was to be thrown in this way pulled her brother and they drowned together.....After that, this capital punishment was abolished by the clan leaders.
This place is currently being developed for hydropower generation.

The picture on the front page was taken by the research team

Published by Karolinska Institutet. Printed by Karolinska University Press
Box 200, SE-17177 Stockholm, Sweden
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ISBN 978-91-7357-433-4

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ABSTRACT

Background: The maternal mortality ratio for Uganda is 435/100,000 live births. Between 12-30 percent of the maternal deaths are due to induced abortions. According to the 2007 Uganda demographic and health survey (UDHS), the contraceptive prevalence rate was 24 percent and only 18 percent used modern contraceptives. The unmet need for family planning (FP) was 41 percent. Emergency contraception (EC) was officially launched in Uganda in November 1998 by the Ministry of Health with the aim of strengthening reproductive health.

Aim: This thesis explores and analyzes factors influencing accessibility, utilization and acceptability of emergency contraception among young people in Kampala, Uganda.

Materials and methods: The first phase of the study was exploratory. Four key informant interviews (KII), and seven focus group discussions (FGDs) were conducted including two male-only, two female-only and three groups with both male and female (I). The transcribed material was analyzed for latent content. In a cross sectional study at Makerere University, 379 students answered a self-administered questionnaire (II). Two-hundred forty-seven health care workers selected from 894 health units in Kampala completed a self-administered questionnaire about their knowledge and prescribing habits of EC (III). To study the acceptability of two EC Pill regimens, 337 women were enrolled in a randomized clinical trial in Kampala, Uganda. Women requesting EC pills within 72 hours after unprotected sexual intercourse received either levonorgestrel (LNG) or combined oral contraceptive pills (Yuzpe regimen). The women returned for follow up after three days and a follow-up interview was performed after one year (IV).

Results: Participants expressed ambivalence about EC pills. The method was generally recommended, but only to the “right people”, in this context being those aged 18 years and above (I). Less than half of the students (45.1%) had ever heard about EC Pills. The most common sources of information about EC were friends (34%) and media (24.8%). The ever pregnancy rate was 3.4 percent and 42 percent were in a steady relationship of three or more months. Among the 14.5 percent contraceptive ever users, the most common methods were condoms (48.9%) and withdrawal (23.4%). Thirty-five percent did not know when in the menstrual cycle they were likely to conceive (II). Among the HCWs, 80 percent had ever heard of EC. The Yuzpe regimen was the most commonly mentioned and prescribed method of EC. The HCWs attitudes toward EC were generally positive and it was suggested that the community should be informed and sensitized about EC. There was a significant difference between having had a family planning educational update or not in the last year and knowledge of EC (p value 0.005) (III). LNG had significantly fewer side-effects than the Yuzpe regimen (p < 0.001). There was a significant association between having worries about the method and experiencing the side-effects (p < 0.001). Both EC Pill regimens were acceptable for use by the studied women, but this could be because most (81%) were prime users of EC. The majority would recommend the EC Pill regimens for use by other clients (IV).

Conclusions: User and potential-user perceptions are crucial in the accessibility and utilization of EC Pill (I). Knowledge about EC and fertility awareness was low among the female first year university students. Friends and the media are an important source of EC information (II). Most HCWs were aware of EC, but some lacked important knowledge on its use and available methods (III). LNG is a superior option to the Yuzpe regimen, and should be promoted as the recommended EC Pill. Worries about the EC Pill, including the mechanisms of action, may influence the experience of side-effects and should be explored further (IV).

Key words: Emergency contraception, young people, acceptability, utilization, health care workers, Uganda

ISBN 978-91-7357-433-4

LIST OF PUBLICATIONS

This thesis is based on the following papers, which will be referred to in the text by their Roman numerals:

- I. Josaphat K Byamugisha, Florence M Mirembe, Kristina Gemzell-Danielsson and Elisabeth Faxelid.
Faced with a double-edged risk: Ugandan university students' perception of the emergency contraceptive pill. Submitted

- II. Byamugisha JK, Mirembe FM, Faxelid E, Gemzell-Danielsson K.
Emergency Contraception and Fertility awareness among University Students in Kampala, Uganda
Afr Health Sci. 2006 Dec;6(4):194-200.

- III. Byamugisha JK, Mirembe FM, Faxelid E, Gemzell-Danielsson K
Knowledge, attitudes and prescribing pattern of emergency contraceptives by health care workers in Kampala, Uganda.
Acta Obstet Gynecol Scand. 2007; 86(9):1111-6

- IV. Josaphat K Byamugisha, Florence M Mirembe, Elisabeth Faxelid, Nazarius M Tumwesigye, Kristina Gemzell-Danielsson
A randomized clinical trial of two emergency contraceptive pill regimens in a Ugandan population. Submitted

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
COC	Combined Oral Contraceptives
CPR	Contraceptive Prevalence Rate
DMPA	Depot medroxy progesterone acetate
EC	Emergency Contraception
ECs	Emergency Contraceptives
ECP	Emergency Contraceptive Pill
FGD	Focus Group Discussion
FP	Family Planning
FPAU	Family Planning Association of Uganda
HCW	Health Care Workers
HIV	Human Immune Deficiency Syndrome
IMR	Infant Mortality Rate
IUD	Intrauterine (contraceptive) Device
JHPIEGO	Johns Hopkins Program for International education in RH
KI	Key Informant
LIC	Low Income Country
LNG	Levonorgestrel
MDGs	Millennium Development Goals
MU	Makerere University
OTC	Over the counter
PIASCY	Presidential Initiative on AIDS Strategy for Communication to the Youth
RCT	Randomized Controlled Trial
RH	Reproductive Health
Sida/SAREC	Swedish international development agency/ Swedish Agency (for) Research Cooperation
STIs	Sexually Transmitted Infections
WHO	World Health Organization

OPERATIONAL DEFINITIONS

- An adolescent is a person aged between 10 and 19 years (WHO 1986)
- Youth are people aged between 15 and 24 years (WHO 1986)
- A teenager is a person aged between 13 and 19 years.
- Young people are those aged between 10 and 24 years. The group of young people thus encompasses adolescents, teenagers and the youth (WHO 1986).
- Gender refers to women's and men's roles and responsibilities that are socially determined. Gender is related to how we are perceived and expected to think and act as women and men because of the way society is organized, not because of our biological differences (WHO 1998).
- The Human Development Index is the measure of life expectancy, literacy, education and standard of living. It is used to determine and indicate whether a country is a low income country (LIC), a middle income country or a high income country, and also to measure the impact of economic policies on quality of life (Lindstrand 2006)
- Family planning (FP) is a comprehensive term, which includes the planning of pregnancies by individuals or couples so that they occur at the right time, the spacing of births for the optimum health of all family members and the stopping of births when the total size has been attained. Family planning thus involves planning when to start pregnancies, spacing and stopping births. Family planning is achieved through use of contraceptives, contraceptive methods or FP methods and the treatment of involuntary infertility.
- Reproductive health (RH) is defined as a state of physical, mental, and social well-being in all matters relating to the reproductive system at all stages of life (WHO 1998).

PREFACE

The origin of the thesis can be traced back to my childhood years; I grew up in a rural area in south western Uganda where women were competing to have as many children as possible. If my mother delivered a child this year, another woman in the neighborhood would make sure that she delivered next, as soon as possible. This used to be said by the children of the respective mothers.

More to that, women were assisted by traditional birth attendants or just delivered by themselves at home. During my clinical years at Makerere University Medical School, I was informed that having numerous pregnancies without proper care and a functional health care system was dangerous. So the question remained, given this knowledge why the high Total Fertility Rate (TFR)? Why were mothers not using family planning? In 1996, I was a supporting physician for the Johns Hopkins Program for International Education in Reproductive Health—formerly the Gynecology and Obstetrics (JHPIEGO) program, in Uganda. JHPIEGO has its headquarters in Baltimore, Maryland USA. I got an offer to do a masters degree in public health in a high income country, but I was not convinced that I needed a second master's degree! At this time, a second master degree in a clinical subject and another degree in public health were in vogue. My wish had always been to do a PhD; but from which country and which university?! These were unresolved questions for several years.

I first heard about Emergency Contraception (EC) as a graduate student in the early 1990s at Makerere University Medical School. In 1998, I attended a meeting in Blantyre, Malawi on strengthening EC in the East, Central and Southern Africa regions organized by the Margaret Sanger Foundation of USA. One of the specialists, Khama Rogo, of World Bank and former co-chair for Partnership for Safe Motherhood and Newborn Health, presented a thrilling paper and said that nausea and vomiting could be reduced by taking emergency contraceptive pills (ECP) concurrently with our local food, e.g. millet. I got enthusiastic; this was coupled with my wish to do a PhD.

In 2001/2002 a team from Karolinska Institutet in Sweden visited Makerere University with the aim of establishing collaboration between the two institutions. This was to strengthen the collaboration that had already started at the national level. The idea was to have a high income country working with a low income country (LIC) and to share experiences in research and training. Thereafter, Uganda and Sweden, through Sida/SAREC strengthened the PhD Program in Uganda and, more specifically, between the two institutions. I utilized this opportunity.

Through my research and by reading books and articles on global health, I have been able to answer some of the questions that were tickling my brain since childhood, i.e. issues of non-use of contraceptives and of fertility determinants.

Vigilando, agendo, bene consulendo, prospera omnia cedunt

By watching, by doing, by consulting well, these things yield all things prosperous.
(Sallust)

1 INTRODUCTION

Emergency contraception (EC) provides women with a safe means of preventing pregnancy subsequent to unprotected sexual intercourse or contraceptive failure (Ho and Kwan 1993; von Hertzen, Piaggio et al. 1998; FFPRHC 2003) It is defined as any method used after sexual intercourse to prevent an unwanted pregnancy. It is not an abortion method (Lalitkumar, Lalitkumar et al. 2007).

The history of EC dates back to 1500 B.C. when sneezing, hopping, jumping, dancing and douching with various herbs and roots were used to prevent conception. In the late 1960s, post-coital douching with Coca Cola was rumored to work; perhaps people believed the bicarbonate “fizz” inhibited conception (LaValleur 2000). Earlier methods relied primarily on douches and disinfectants, sometimes marketed as ‘feminine hygiene products’ to avoid restrictive legislation concerning birth control apparatus.

The first documented case of emergency post-coital contraception was published in the 1960s when physicians used this method to prevent pregnancy in a survivor of sexual assault (Ellertson 1996). As recently as the early 1990s, nearly one-third of emergency contraception pills (ECP) prescribed in the USA were for rape victims (Grossman and Grossman 1994). The unmet need for FP methods in Uganda is 41 percent (UBOS 2007).

Increasing contraceptive use, including ECs, can markedly reduce unwanted pregnancies and thus unsafe abortion (Okonofua 2006). The other advantage for provisioning the use of EC is that issues, such as STI and HIV/AIDS, concerning use of other FP methods can also be discussed. This helps to introduce the client to other reproductive health (RH) services and is a way to promote STI/HIV/AIDS prevention.

With increasing contraceptive use and the unmet need, there is reason to increase a mixture of contraceptive methods for avoidance of pregnancy. Use of EC will decrease the costs, as well as the emotional and physical risks experienced by women who have

had unprotected intercourse (Chiou, Shrier et al. 1998), when compared to having to undergo an unwanted pregnancy or induced abortion.

Emergency contraception occupies an anomalous position in the contraceptive methods repertoire (Ziebland 1999), and their importance resides in the fact that it is the only contraceptive method a woman can use after having unprotected sexual intercourse or a contraceptive accident. By making EC more widely available, FP and RH care providers can help reduce unplanned pregnancies, many of which result in unsafely induced abortion and take a huge toll on women's health.

1.1 Nomenclature

At one time, ECPs were called "morning-after" pills. Other terms that have been used include post-coital pills, post-coital contraception, interceptives, and morning after treatment (Creinin 1996; ACOG 2002; Tripathi, Rathore et al. 2003). Today, the term, "morning-after" pill is not recommended because treatment:

- may involve more than one pill
- may not necessarily be a pill
- does not need to occur on the "morning after" (it can be before or after)
- research has shown that the sooner after intercourse the treatment is used the more effective it is

To stress this, the terms "Emergency Contraception" and "Emergency Contraceptive Pills" have been introduced and recommended.

1.2 Chronology of facts and available methods

Trials on EC were first described in the 1930s using high doses of stilbestrol (Morris and Van Wagenen 1966). The ECP regimen first approved by the U.S. Food and Drug Administration is commonly called the Yuzpe Regimen, named after Canadian Professor A. Albert Yuzpe who, in 1974, published the first studies demonstrating the safety and efficacy of an EC regimen (Yuzpe 1977; Yuzpe 1978). The initial regimen consisted of 0.1 mg ethinylestradiol and 0.5 mg levonorgestrel, given within 72 hours of intercourse

and repeated after 12 hours (Yuzpe and Lancee 1977) . The Yuzpe regimen has since been the most commonly used method.

Other available methods today are the administration of levonorgestrel 0.75 mg, repeated after 12 hours or in a single dose of 1.5 mg, a single dose of 10 or 25 mg mifepristone (only available in China), or insertion of a copper intrauterine device (IUD) (Lippes, Malik et al. 1976) . Other interventions that have been tried include the antigonadotropin, Danazol (Webb 1997).

Recently, treatment with only levonorgestrel and mifepristone has emerged as the most effective hormonal method with very low side-effects and higher efficacy than the standard Yuzpe regimen (WHO 1998; WHO 1999; Cheng, Gulmezoglu et al. 2004). Following these studies, levonorgestrel 1.5 mg has become the recommended regimen worldwide. This regimen can be effective up to 120 hours after unprotected sexual intercourse, but the efficacy is higher the sooner the pills are taken (WHO 1998). The hormonal methods are usually also considered as more convenient than the insertion of a copper IUD, which is otherwise the most effective method. Post-coital insertion of an IUD can be used up to five days after the estimated time of ovulation and it can be left in the uterus as a long-term, regular contraceptive method.

The ECP currently recommended by WHO is 1.5 mg of levonorgestrel as a single dose (WHO 2007). In a recent WHO multicentre randomized study, the pregnancy rate after use of levonorgestrel (1.1%) was significantly lower than that following treatment with the Yuzpe regimen (3.2%) (WHO 1998). It was estimated that levonorgestrel administered within 24 hours after unprotected intercourse can prevent about 85 percent of the expected pregnancies. The incidence of the side effect was also noted to be significantly lower than that with the Yuzpe regimen. As with the Yuzpe regimen, the pregnancy rate increased when the interval between intercourse and treatment was longer: 0.4 percent when given within 24 hours and 2.7 when given between 49 and 72 hours after intercourse. Further analysis of the data for both the levonorgestrel and Yuzpe

regimen showed that a consistent and significant linear relationship existed between the efficacy and the intercourse treatment interval (Ho 2000) (figure 1).

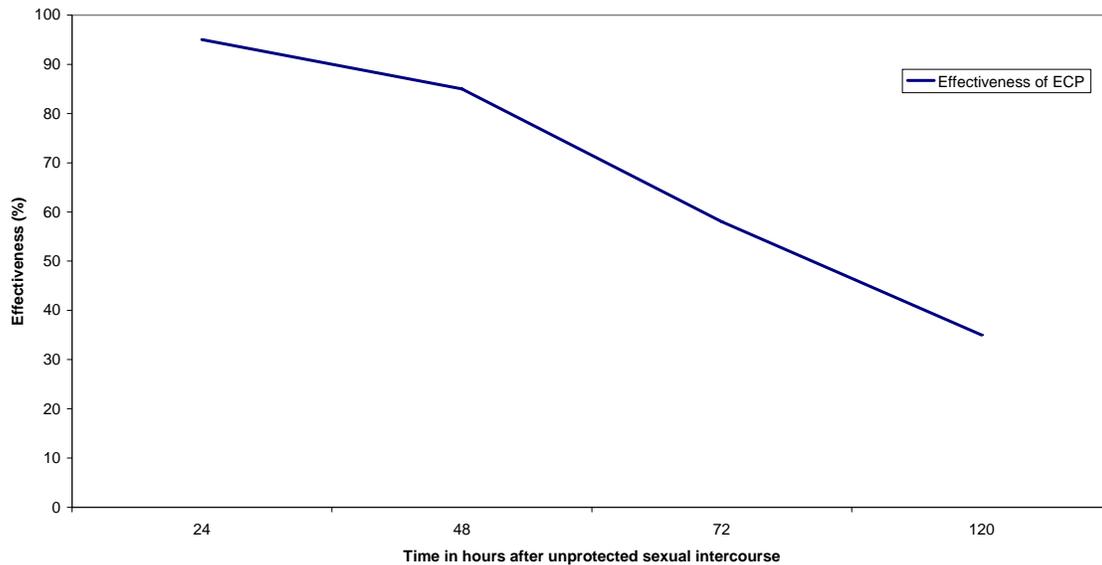


Figure 1. Effectiveness of ECP vs time

1.3 Mechanism of action

One of the main barriers to widespread use of EC is concern about the mechanism of action. The mechanism of action depends on the particular type of EC. An understanding of the mechanism of action of contraceptive methods is essential for the development of new methods, as well as for optimizing the use of those already available, and knowledge of the mechanism may also influence religious, cultural and individual acceptability. Available data from studies in humans indicate that the contraceptive effects of both levonorgestrel and mifepristone, when used in single low doses for emergency contraception, involve either blockade or delay of ovulation, due to either prevention or delay of the luteinizing hormone surge, rather than inhibition of implantation (Marions, Hultenby et al. 2002; Gemzell-Danielsson and Marions 2004; Lalitkumar, Lalitkumar et al. 2007; Novikova, Weisberg et al. 2007; Okewole, Arowojolu et al. 2007).

A two-dose regimen of levonorgestrel (two doses of 0.75mg at a 12 hour interval) was first reported by Ho and Kwan (Ho and Kwan 1993), although the mechanism of action for the treatment was not properly researched until recently and data confirms that levonorgestrel acts as an emergency contraceptive by suppressing or delaying the luteinising hormone surge if given pre-ovulatory. Research has also shown that there is no effect of EC on endometrial development even when given during the mid-luteal phase (Marions, Hultenby et al. 2002) or during embryo implantation (Lalitikumar, Lalitikumar et al. 2007).

1.4 The fertile period and indications for emergency contraception

There is no time in the menstrual cycle when there is absolutely no risk of pregnancy following unprotected sexual intercourse (figure 2). This is especially true if the cycle is irregular or if there is uncertainty about the date of the last menstrual period. Nevertheless, the probability of pregnancy in the first three days of the cycle is negligible (Wilcox, Weinberg et al. 1995). The possibility of late ovulation produces a persistent risk of pregnancy even into the fourth week (Wilcox, Dunson et al. 2001). Even among women with regular cycles there is variability in the phases, and the follicular phase contributes most to this (Fehring, Schneider et al. 2006).

Any woman of reproductive age may need EC at some point in her life to avoid an unwanted pregnancy (WHO 2007). It is recommended to be used in situations such as:

- when no contraceptive has been used
- when there is a contraceptive failure or incorrect use, including:
 - condom breakage, slippage, or incorrect use
 - three or more consecutive missed combined oral contraceptive pills
 - progestogen-only pill (minipill) taken more than three hours late
 - more than two weeks late for a progestogen-only contraceptive injection (depot-medroxyprogesterone acetate or norethisterone enanthate)

- more than seven days late for a combined estrogen-plus-progestogen monthly injection
- dislodgment, delay in placement, or early removal of a contraceptive hormonal skin patch or ring
- dislodgment, breakage, tearing, or early removal of a diaphragm or cervical cap
- failed coitus interruptus (e.g. ejaculation in vagina or on external genitalia)
- failure to melt of a spermicidal tablet or film before intercourse
- miscalculation of the periodic abstinence method or failure to abstain on fertile day of cycle
- IUD expulsion
- in cases of sexual assault when the woman was not protected by an effective contraceptive method

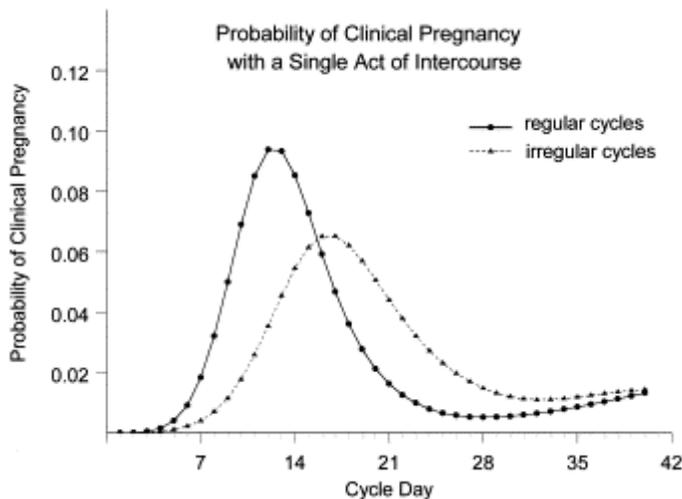


Figure 2. Probability of clinical pregnancy with one act of intercourse relative to day of the menstrual cycle, for women who reported regular cycles, and for those who reported irregular cycles (Wilcox, Weinberg et al. 1995) (*Shown with permission from Professor A J Wilcox*)

1.5 ICPD and ICPD+5, Millennium development goals

The 1994 International Conference on Population and Development (ICPD) articulated a new vision about the relationships between population, development and individual well-being. At the ICPD, 120 nations adopted a forward-looking, 20-year 'Programme of Action' (PoA) (Cohen and Richards 1994). The PoA built on the success of the population, maternal health and FP program of the previous decades while addressing, with a new perspective, the needs of the early years of the 21st century. The ICPD PoA, sometimes referred to as the Cairo Consensus, recognized that RH and rights, as well as women's empowerment and gender equality, are cornerstones of population and development programs. The Consensus is rooted in principles of human rights and respect for national sovereignty and various religious and cultural backgrounds (ICPD Programme of Action Publication date: 1994).

In 1999, the United Nations General Assembly convened a special session, ICPD+5, to review progress towards meeting the ICPD goals. The review revealed that greater urgency was needed to achieve the PoA, especially in the areas of education and literacy, reproductive health care and unmet need for contraception, maternal mortality reduction and HIV/AIDS. In September 2000, the largest-ever gathering of Heads of State ushered in the new millennium by adopting the Millennium Declaration. The Declaration, endorsed by 189 countries, was then translated into a roadmap setting out goals to be reached by 2015 (Millennium Declaration (*ref A/RES/55/2 - Resolution Adopted by the United Nations General Assembly, 2000*)).

The eight Millennium Development Goals (MDGs) build on agreements made at UN conferences during the 1990s and represent a number of commitments. The eight MDGs are to:

- eradicate extreme poverty and hunger
- achieve universal primary education
- promote gender equality and empower women
- reduce child mortality
- improve maternal health

- combat HIV/AIDS, malaria and other diseases
- ensure environmental sustainability
- develop a global partnership for development

Basically all the MDGs touch aspects of health in one way or another. There are challenges, however, attached to achieving the MDGs in LICs (Murray, Frenk et al. 2007; Nordstrom, Tan-Torres Edejer et al. 2007). At the midway point between their adoption in 2000 and the 2015 target date for achieving them, sub-Saharan Africa is not yet on track to achieve any of the goals (UN report 17th September 2007).

Reducing maternal mortality rates by 75 percent is included in number 5 of the MDGs. Strategies to decrease maternal mortality in LIC include improving access to emergency obstetric care and family-planning services (Rosenfield and Schwartz 2005). Promoting EC is related to the third MDG, i.e. “Gender equality and empowerment of women”.

1.6 Global perspectives about contraceptives and abortions

Each year, women undergo an estimated 19 million unsafe abortions, costing some 68,000 women their lives (WHO 2007). For every woman that dies, several others suffer pain, lifelong disability, or complicated future pregnancies as a result of the procedure. According to the World Health Organization, these complications are responsible for 13 percent of all maternal deaths (WHO 2007).

Most, but not all, unsafe abortions take place in LICs. Unsafe abortion is one of the greatest health risks that a young woman can face. The primary reason for induced abortion is unintended pregnancy (Kaye, Mirembe et al. 2005; Sedgh, Bankole et al. 2006). Expanding women's access to safe and voluntary family planning counseling and services, and to a range of modern, safe, and effective contraceptives will allow them to plan the timing and spacing of their births. Ensuring that the need for contraception is met will reduce maternal mortality substantially and improve maternal health by avoiding unsafe abortions (Henshaw, Singh et al. 1999; Sedgh, Henshaw et al. 2007).

Emergency contraception is one way to reduce unwanted pregnancy. The first recorded global meeting to address EC was held in April 1995 in Bellagio, Italy. Twenty-four experts from around the world, representing the fields of research, policy, communications, women's advocacy and medicine met to discuss EC. The conference was hosted by South-to-South Cooperation in Reproductive Health and was co-sponsored by the International Planned Parenthood Federation, Family Health International, the Population Council and WHO. The conference was supported by the Rockefeller Foundation. The meeting came out with a consensus statement on EC. The statement addressed issues of methods for EC, policy and regulatory, information, education, communication, advocacy, and service delivery monitoring and evaluation (South-to-South-Coop. 1995). The statement encouraged providers to learn about the EC methods and to make them available to all women who may need them.

1.7 Contraceptive usage in Africa

The contraceptive prevalence rate is lowest in Africa and this is coupled with bad health indicators (Seiber, Bertrand et al. 2007). Africa has not yet experienced the contraceptive revolution. Surveys carried out between 1980 and 2005 in 104 LICs among married women of reproductive age were analyzed (Seiber, Bertrand et al. 2007). According to this analysis contraceptive use among married women of reproductive age increased in all regions of the LICs, reaching 66 percent in Asia and 73 percent in Latin America and the Caribbean in 2000–2005, though only 22 percent in sub-Saharan Africa. In Africa, Mauritius has the highest contraceptive prevalence rate at 75 percent but this is quite different from the rates for the countries on mainland Africa. According to the surveys the proportion of married contraceptive users relying on the IUD declined from 24 to 20 percent and the proportion using the pill fell from sixteen to twelve percent. The share of contraceptive method mix for injectables climbed from 8 percent to 26 percent in sub-Saharan Africa, while the share for condoms was 5-7 percent (Seiber, Bertrand et al. 2007).

An issue that has been debated is whether family planning methods are at all needed in Africa. There is need for a paradigm shift for people equating FP to population control. It

is much more than just reducing birth numbers. It is about improving quality of life for women, men and their families. FP method use should be looked at in the scope of other fertility determinants, such as high perinatal and infant mortality rates and others as indicated by Caldwell (Lindstrand 2006).

One of the problems that LICs are currently facing is decreasing funding for FP commodities and program (Gribble, Jennings et al. 2004).

1.7.1 Emergency contraception in Africa

Work has been done to expand EC availability in Africa. Most of the reported research is from South Africa and Nigeria (Hariparsad 2001; Aziken, Okonta et al. 2003; Mqhayi, Smit et al. 2004; Myer, Mlobeli et al. 2007). Attempts to reach disadvantaged populations such as refugees have been reported from Tanzania (Goodyear and McGinn 1998). Research from Uganda indicates that EC is provided routinely to those women who have been sexually assaulted (Ononge, Wandabwa et al. 2005). Research has also been done in Kenya (Gichangi, Karanja et al. 1999; Muia, Ellertson et al. 2000), Ghana (Steiner, Raymond et al. 2000; Baiden, Awini et al. 2002) and Ethiopia (Kebede 2006). In all these studies, awareness and knowledge about EC is insufficient. Availability of EC varies from country to country. Some countries such as South Africa have EC available over the counter (OTC), while others hardly use EC (Myer, Mlobeli et al. 2007). Recently, EC in Africa is being coordinated by *ECafrique*, based in Nairobi, Kenya.

1.7.2 Contraception in Uganda and related health indicators

Contraceptive methods were first introduced in Uganda in 1957 by Family Planning Association of Uganda (FPAU) under the International Planned Parenthood Federation (IPPF). Contraceptive use has been increasing in Uganda since 1991, as evidenced by the rising contraceptive prevalence rate (CPR) for Uganda (Table 1). However, 50 years from the introduction of contraceptive methods, the CPR is still low (24%). The unmet need is 41 percent and this is usually considered to be an underestimation (Westoff 1994).

Attempts are currently being made to reposition and revitalize FP use, not only in Uganda but in the east and central African region as a whole.

Table 1. Selected health indicators for Uganda*

Indicator	YEAR			
	1991	1995	2002	2007
Contraceptive prevalence rate	5	14.9	22.8	23.7
Total fertility rate	7.1	6.9	6.9	6.7
Unmet need for FP (%)	54	29	35	41
Maternal mortality ratio	527	506	505	435
Adolescent pregnancy (%)	44	43	32	31
Infant mortality rate (/1000)	122	81	85	76
Stunted children (%)	38	38	39	32
HIV prevalence rate	30	15	6.1	6.4
Supervised deliveries (%)	38	38	38	41
Human development index			0.449	
Number of induced abortions/year			297,000**	

* (UBOS 2007)

** (Singh, Prada et al. 2005)

The FP methods officially available are: progestin-only pills, combined oral contraceptives (COC) e.g. Lofemenal, the copper T IUD and the single rod sub-dermal implant was introduced in March 2007 and the two rod subdermal implant is to be introduced in 2008. Other methods include condoms and fertility awareness methods, such as moon beads (a modification of the standard days method). Some of the newer FP methods, e.g. levonorgestrel containing IUDs (Mirena, Beyer Schering Pharma), are not available yet in Uganda. According to the 2007 Uganda demographic and health survey (UDHS) modern methods are more widely known than traditional methods. For example, 96 percent of women had heard of at least one modern method, while only 70 percent knew of a traditional method. Among all women, pills, injectables and the male condom were the most widely known FP methods, with at least 90 percent of all women saying

they had heard of these methods. The least widely known methods are lactational amenorrhea method (LAM) and EC (UBOS 2007).

Some of the FP related health indicators include, CPR, total fertility rate (TFR), maternal mortality ratio (MMR), infant mortality rate (IMR) and adolescent pregnancy (Table 1). The MMR in Uganda is 435/100 000 live births (UBOS 2007). The IMR is 66 deaths per 1000 live births for mothers with at least some secondary education compared to 104 deaths per 1,000 births for those whose mothers are not educated (UBOS 2007). Birth spacing less than 2 years and maternal age influence child mortality in a negative way (UBOS 2007).

1.7.3 Emergency contraception in Uganda

Emergency contraception was officially introduced in Uganda by the Ministry of Health in November 1998 with the aim of improving RH. The method, however, remained poorly known and unavailable. In 2001, the method was re-introduced by many authoritative people signing a document, which was published in the leading national newspapers to coincide with international Women's Day. Examples of the signatories included commissioners of health, leading gynecologists and other influential persons in health delivery in the country. The method introduced was a dedicated product with the brand name Vikela (two tablets of 0.75mg levonorgestrel). The public response was negative and meddled with suspicion. Through the media, readers raised questions about why so many distinguished people had to sign and even have prints in the newspapers to introduce a pill. There was outrage from the religious leaders and Vikela was banned from the Ugandan market. The media reporting contained confusing information about the ECP, especially on the mechanism of action. However, recently EC methods are being sold in pharmacies in Kampala, Uganda.

A study was done among health care providers in Kampala in 1998 and it indicated that about 80 percent of health care workers were not aware of EC (Esiru 1998).

1.8 Important issues about emergency contraception

A number of issues related to EC have appeared frequently in the literature. The issues include acceptability, knowledge and information, STIs, use of regular FP methods, costs, preventing unwanted pregnancies, effectiveness, safety and side-effects.

1.8.1 Acceptability

If any new contraceptive technology is to become a viable option for decreasing unintended pregnancies, women and men must be willing to use the method and find it acceptable. However, because ECPs have not been widely used, very little has been known about the acceptability of this method (Harvey, Beckman et al. 1999). In a study carried out in San Diego on 235 women in order to assess their experience and satisfaction with ECP, the overwhelming majority would recommend them to friends (91%) and family members (97%). In a study done in San Francisco on 1,950 ECP users, the majority viewed EC with levonorgestrel (LNG) favorably. Advance provision of ECPs improved promptness and convenience of use overall, while pharmacy access benefited specific populations, such as condom users (Rocca, Schwarz et al. 2007).

In a study on the attitudes of Swedish teenagers toward ECP, where 408 teenagers filled a questionnaire, the attitude towards using ECP in an emergency situation was positive (Haggstrom-Nordin and Tyden 2001). The girls believed ECP could be used much more, and two-thirds of both sexes thought it could lead to negligence with ongoing contraception. Seventy-seven percent of teenagers preferred to turn to a youth clinic when in need of ECP.

1.8.2 Knowledge and information: Is EC still a secret in the year 2007?

Knowledge of EC is crucial since women must know that there is a method that can prevent pregnancy after intercourse in order to seek treatment (Westley 1998). It is important that potential users have information and are educated about EC before they

actually need it (Virjo, Kirkkola et al. 1999). Friends or the media are at times the most important sources of information about EC (Tyden, Wetterholm et al. 1998).

Studies have shown that EC options are under-utilized because of lack of client awareness (Jamieson, Hertweck et al. 1999). Studies have shown that there is limited knowledge of EC among health providers ranging from obstetricians/gynecologists (Delbanco, Mauldon et al. 1997), and nurses and midwives (Gichangi, Karanja et al. 1999), (Langer, Harper et al. 1999), (Muia, Ellertson et al. 1999) to students and potential users (McDonald and Amir 1999; Tyden, Aneblom et al. 2002). Emergency contraception has been regarded as the “best kept secret” (Ellertson, Winikoff et al. 1995; Bell and Millward 1999). However, in high income countries, it is no longer a secret (CTU 1998) as opposed to the case in LICs.

An evaluation has been done concerning the quality of EC information on the internet (Latthe, Latthe et al. 2000) There were about 32 relevant websites and none of the websites provided complete information to patients about EC according to the criteria used in the study. There is need for resources that provide accurate medical information for clients who are unable to access health care or to discuss certain subjects with their providers (Wynn and Trussell 2005). However, internet as a resource for emergency contraception appears to be limited to women of high socioeconomic status (Wu, Gipson et al. 2007).

1.8.3 Sexually transmitted infections and use of regular FP methods

There have been concerns that women will use the ECP as a form of contraception and put themselves at risk for STIs and HIV infection (Dupont, Webber et al. 2002). However, studies have indicated that the use of EC does not increase the risk of clients acquiring STIs (Falk, Falk et al. 2001; Fox, Weerasinghe et al. 2004). Studies have also shown that clients who use EC are not less likely to use other methods of contraception (Ellertson, Ambardekar et al. 2001).

1.8.4 A cost-effective intervention

Emergency contraception is cost-effective whether provided when the emergency arises or in advance to be used when needed (Trussell, Koenig et al. 1997; Trussell, Koenig et al. 1997; Trussell and Calabretto 2005). Emergency contraception offers a low cost, effective method to reduce the incidence of unintended pregnancy and its consequences, which might be life-threatening. Emergency contraception reduces the costs, as well as emotional and physical risks to women who have had unprotected intercourse (Chiou, Shrier et al. 1998).

1.8.5 Preventing unwanted pregnancies and unsafe abortions

In many LICs, poverty, malnutrition and lack of sanitation and education contribute to serious health consequences for women and their families experiencing an unintended pregnancy (Klima 1998). In LICs, unsafe abortion can result in serious long term negative health effects, including infertility and maternal death.

Unintended pregnancy and its negative consequences can be prevented by access to contraceptive services, including emergency contraception. In many LICs, unsafe abortions are a leading cause of death among women of reproductive age. Abortions are also a major drain on scarce medical resources. In these settings, the availability of EC would reduce the growing pressure on hospital beds, nursing staff, blood supplies and medication needed to treat any life-threatening medical complications resulting from abortions.

According to the Ugandan law, abortion is illegal except in situations when the patient's life is in danger.

1.8.6 Method effectiveness, safety and side effects

The reported pregnancy rates are about 0.2 – 3.0 percent with the Yuzpe regimen and levonorgestrel, 0.3 – 1.6 percent with high-dose estrogen, and 0.0-0.1 percent with the IUD (Van Look and von Hertzen 1993). The number of pregnancies prevented are based

on the 20-30 percent risk of getting pregnant in a menstrual cycle when the man and woman are both fertile (Trussell, Ellertson et al. 2003). The effectiveness depends on the intercourse-treatment interval. The sooner EC is used after unprotected sexual intercourse the more it is likely to prevent pregnancy.

Emergency contraception should be used occasionally rather than as a regular form of contraception (Van Look and von Hertzen 1993). This is because it is not as effective as the contraceptives that can be used regularly. The main side-effects caused by hormonal ECs are nausea and vomiting, which seem to be more frequent with estrogen-only containing regimens, such as the Yuzpe regimen. In countries where mifepristone is used, it may cause a delay in the next menstrual bleeding in some women. Insertion of an IUD can cause discomfort and requires trained staff and facilities.

Studies have indicated that the use of post-coital contraception is safe. There have been fears of idiopathic venous thrombo embolism, especially among clients using COC, but this has not been proved (Vasilakis, Jick et al. 1999). Fears about the strength of the dose in hormonal EC have been reported among clients (Ziebland and Maxwell 1998). The fears were mainly documented in the UK after the October 1995 pill scare in Grampian where a number of deaths were reported following the use of third generation pills (Flett, Gurney et al. 1998).

1.9 Gender perspectives in emergency contraception

Gender refers to women's and men's roles and responsibilities that are socially determined. Gender is related to how we are perceived and expected to think and act as women and men, because of the way society is organized and not because of our biological differences (WHO 1998). Gender determines what is expected, allowed and valued in a woman or a man in a given context. Gender is relational (based on socially constructed roles for women and men), hierarchical (based on power relations between men and women), historical (changes over time and differs from one culture to another), contextually specific (variations in gender relations depend on ethnicity, age, sexual

orientation, religion) and institutionally structured (social relations supported by value, legislation, religion).

In most societies there are differences and inequalities between women and men in responsibilities assigned, in activities undertaken, in access to and control over resources, as well as in decision-making opportunities. At times gender may have an effect on how counseling is performed regarding contraceptive use and other RH related issues (Sibil, Judith et al. 2007).

An analysis was done on data from Uganda to examine the contextual effects of gender norms, media use, interpersonal communication, and social capital on family planning behavior. Results of the hierarchical linear modeling showed that all of the four variables were significant predictors of family planning behavior (Paek, Lee et al. 2007). Use of FP methods is facilitated when husbands and wives discuss the issue and air their views. According to the 2007 UDHS, 45 percent of married women had not discussed FP with their husband. Younger women, as well as women in their 40s, were more likely not to have discussed FP with their partners or husbands than women in the prime childbearing ages (UBOS 2007). There is need for contraceptives that can be entirely controlled by the woman. Hormonal EC is such a method.

According to the 2007 UDHS, knowledge of at least one method was slightly higher among men than women. Men were generally more likely than women to know about male sterilization, male and female condoms, LAM, rhythm, and withdrawal, while women were more likely to know about female-oriented methods such as female sterilization, the pill, IUD, injectables, and implants. Overall, the average number of methods known by women and men was very similar—6.8 methods for women and 6.5 methods for men (UBOS 2007).

EC is one of the methods that can be entirely chosen and used by the woman alone without involving the partner.

1.10 The health care system in Uganda

The health care system in Uganda consists of both public and private health units. There are now health center (HC) grades II to IV, and hospitals. Each category depends on the administrative zone served and the different types of services provided. Health center II serves a population of about 5,000 people and provides outpatient care, antenatal care, immunization, and outreach. Health center III serves a population of about 20,000 people and provides all the services of HCII, plus inpatient care. Health center IV serves a population of about 100,000 people and it provides all the services of an HC II and HC III, plus surgery. In the public sector, there are two national referral hospitals. There are also hospitals at the regional and district levels. There are a few private hospitals coming-up, mainly in the urban areas amidst many private clinics (classified as HCII).

1.11 The education system in Uganda

The Ugandan education system consists of preschool, primary school (7 years), 6 years of secondary school, (divided into 4 years of lower secondary and 2 years of upper secondary school), and 3 to 5 years of post-secondary education. The education system is arranged under private and public schools. Previously, only people who could afford to pay could take their children to school since there were school tuition fees. In 1997, however, the government introduced universal primary education and this continued with universal secondary education. This greatly increased school enrolment for young people, where in 1999 there were 6 million pupils receiving primary education, compared to only 2 million in 1986.

The education system in Uganda has a comprehensive health and sexuality education program with messages encouraging delay in the initiation of sex and reduction in sexual risk-taking behaviors among sexually experienced youth (Alford 2005). The program was launched by the Ugandan President and is called the President's Initiative on HIV/AIDS Strategy on Communication to Youth (PIASCY). The program includes important messages about sexual and reproductive health with special reference to AIDS. In every primary school visited by Human Rights Watch in November 2004, school staff members were following the PIASCY program. Manuals had been distributed nationwide and

training had been provided to at least three teachers per primary school. Every two weeks, entire schools were meant to hold assemblies with trained teachers instructing the students about the messages. The assemblies were opened with the message, “Choose to abstain” and proceeded to address numerous aspects of HIV prevention (including messages entitled “Condom use” and “HIV testing”), sexual and reproductive health, and “life skills” such as self-esteem, assertiveness, and resisting peer pressure. Other abstinence-oriented messages included “virginity is healthy,” “choose to delay sex,” “pre-marital sex is risky,” and “acceptable moral practices” (Ministry of Education and Sports 2004). In addition to the assembly messages, teachers had been encouraged to incorporate each biweekly message periodically in their class lessons, regardless of the subject.

2 WHY YOUNG PEOPLE?

Almost half of the global population today is composed of young people (10-24 years). There are more than 1.2 billion people aged 10-19 years and 87 percent of them live in LICs. Twenty four percent of the population in Uganda is between 10-19 years. This indicates that one of every four persons is an adolescent. Thirty three percent of the population is aged between 10-24 years, implying that everyone in three of the Ugandan population is a young person. Uganda thus has a predominantly young population.

Young people are in a transition period between childhood and adulthood. They experience psychological and social changes at puberty, including sexual arousal. In addition they are in a state of experimentation and discovery. They do not want to behave as children and want to take on adult characteristics, much as they are not yet adults. Because of this they are predisposed to many risks, including unwanted pregnancy, drug abuse and STIs, including HIV/AIDS. Unintended pregnancies often force young people into unwanted marriage or limit their opportunities to further education or employment while predisposing them to long-term welfare dependence.

The teenage pregnancy rate in Uganda is 25 percent (UBOS 2007). This can be related to the early onset of sexual activity, low contraception use, and limited knowledge about sex and its outcomes. Young people lack access to accurate information and adolescent friendly RH services. According to the 2007 UDHS, Ugandan women are adopting

family planning at lower parities (i.e. when they have fewer children) than in the past. Among younger women (age 20-24), 23 percent used contraception before having any children and 16 percent first adopted contraception when they had only one child. Among older women (age 45-49), only one percent used contraception before having any children and three percent first used contraception when they had one child (UBOS 2007).

Maternal Mortality Ratio in Uganda is 435/100,000 live births and higher in some parts of the country. About 13 – 30 percent of maternal deaths are due to unsafe abortions and most of these are among young people.

3 AIM AND SPECIFIC OBJECTIVES

3.1 Aim

To describe and analyze factors influencing accessibility, utilization and acceptability of emergency contraception among young people in Kampala, Uganda.

3.2 Specific objectives:

To explore the perceptions about Emergency Contraception (EC) among university students in Kampala, Uganda

To determine knowledge about, use of and attitudes toward EC among female first year university students in Kampala, Uganda

To assess knowledge, attitudes and prescription patterns of EC among health care workers in Kampala district, Uganda, in order to identify training needs about EC

To determine side-effects and acceptability of the established Yuzpe regimen and the new and more effective levonorgestrel regimen among young EC users in Kampala, Uganda

4 MATERIALS AND METHODS

In this study, both qualitative and quantitative research methods were used (Table 2). The studies were carried out between January 2005 and December 2006.

Table 2. Study designs, methods and participants.

Paper	Design	Period	Data collection	Participants
I	Qualitative-exploratory	Jan-Apr 2005	Seven focus group discussions and four key informant interviews	76 university students
II	Cross sectional	Jan-Mar 2005	Self administered questionnaires	379 first year female university students
III	Cross sectional	Mar-Nov 2005	Self administered questionnaires	247 health care workers
IV	Randomized clinical trial	Mar 2005-Dec 2006	Interviewer administered questionnaires	337 emergency contraceptive pill users

4.1 Study setting

The studies were carried out in Kampala district in Uganda. Kampala is the capital of Uganda and is situated almost in the middle of the country, covering a surface area of 195km². Kampala is administratively divided into five divisions, namely Central, Kawempe, Makindye, Rubaga and Nakawa (Figure 3).

According to the Population and Housing Census in 2002, Kampala's population grew at a rate of 3.9 percent per annum in the inter-censal period between 1991 and 2002 (UBOS 2006). Also, the 2002 Census put the city population at 1.2 million people, but the city has a daily transient population of about 2.3 million people. Urban areas in Uganda contain 12.2 percent of the national population, of which 41 percent is located in Kampala city (UBOS 2006).



Figure 3. Uganda and the five divisions of Kampala district (not to scale).

Makerere University (MU) is Uganda's largest and oldest university. Makerere offers undergraduate programs to about 30,000 students. It is located on the outskirts of Kampala city in Rubaga division. There are three main residence halls for female students and there are many hostels around the main campus. Female students compose about 47 percent of the total number of students.

4.2 Study design, participants and data collection methods

This thesis is based on qualitative data from paper I, i.e. Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs), and from quantitative data from papers II, III and IV.

4.2.1 Paper I

In paper I, the qualitative data collection methods, FGDs and KIIs were used.

Focus group discussions are defined as carefully planned discussions designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment (Krueger 1994). The participants were purposively selected according to the year of study, the courses and districts of origin in order to get as many different aspects as possible. Seven FGDs were conducted. Two of the FGDs were comprised of males only, two were girls only and three were a mixture of both females and males. For each group there were 9-12 participants. The only information participants received before the discussion was that they were to discuss issues related to reproductive health. Three FGDs were conducted in the common rooms of halls of residence; one in the garden at the MU Institute of Languages, and three were conducted at the freedom square within the university campus. A trained moderator and a note-taker conducted the FGDs using a FGD guide. The duration of the FGDs ranged from 50-90 minutes. The content of the FGD guide was based on results from previous research done about EC among young people (Tyden, Wetterholm et al. 1998; Haggstrom-Nordin and Tyden 2001; Aneblom, Larsson et al. 2002) and the guide was pilot tested on a group of students in order to have a better idea about the flow and clarity of the questions. Thereafter the guide was slightly revised. The guide covered the following areas: methods of contraception available in Uganda, understanding of EC, mechanism of action, efficacy, time limit after unprotected intercourse, side-effects, availability of ECs, menstrual cycle and discussion of EC with parents. The author and one research assistant conducted all the focus group discussions. Debriefing meetings were held at the end of each day of data collection.

The FGDs were carried out until information saturation was achieved and that is why a total of seven was done. Information saturation meant that by the seventh FGD we realized we were not getting any new information (Sandelowski 1995). All FGDs were tape recorded and transcribed verbatim.

In addition to the FGDs, four KIIs were conducted. A key informant (KI) is a member of the social or cultural group in the research context who provides information and assistance with interpretation of the setting. The key informants were purposefully selected and included the Guild president (students' overall leader), an interior secretary and two secretaries for health of halls of residence. Three of the key informants were interviewed at their halls of residence. One preferred to be interviewed in the city center. Three of the interviews were tape-recorded. One KI did not want the interview to be tape-recorded. For the latter, notes were made during the interview and we relied on this for analysis. The recorded interviews were transcribed verbatim.

4.2.2 Paper II

This study was carried out at MU among first year female undergraduate students, both residents and non-residents. The students were identified from the halls they were attached to and hostels of residence. First the room numbers for first year students were obtained. In most of the rooms, several (3-6) students resided. The students were then approached individually. Every fourth student was asked to participate in the study until the sample size of 379 was attained. Those students who were not available at first visit were revisited until found.

A self-administered questionnaire with closed and open ended questions was given to the students who consented to participate in the study. Twenty-four students refused to participate because they were not interested and another five did not return the questionnaires. The questionnaire covered information about age, places of residence, courses being taken, history pertaining to a relationship, history of pregnancy and the outcomes, general contraceptive "ever use" and attitudes towards EC. Specific questions were asked about knowledge of EC, such as mechanism of action, availability, use of

condoms in relation to EC use and time in the menstrual cycle when someone is likely to get pregnant. The questionnaire also had open ended questions about the role of young people in provision of EC and parents' role in availability of contraceptives. The questionnaire was pilot tested and a few adjustments made. The questionnaires were filled-in anonymously and in privacy and picked by the research assistants at an agreed upon time. Most of the questionnaires were filled-in immediately.

4.2.3 Paper III

This study was carried out among health care workers (HCW) in Kampala district. A list of all the health care units (health centers and hospitals) in Kampala was obtained from Kampala city council. Fifteen health care units were on the list, but were found as not providing FP methods while 16 new units providing FP were not on the list. A HCW was defined as any person employed in a health care setting and providing FP methods.

Due to differences in the number of staff, the probability proportional to size sampling method was applied. The estimated cumulative total of the HCWs in the health units was 1,889 and this was divided by the total number of health units (894) to get the interval range (r). The interval range was 2 (every second number starting from the random start was selected). Where two numbers corresponded with the same health care units, twice as many staff was selected. Informed consent was sought after introducing the study to the participants. In case of refusal by the selected participant, an alternate HCW was selected from the same unit.

4.2.4 Paper IV

This study was carried out among clients who visited one of four study sites (Mulago, Naguru, Kawempe and Katego FPAU model clinic) in Kampala district in order to get ECs. The sites were the FP referral clinics for EC. Clients were introduced to the study when they indicated that they had come to get ECs. Inclusion criteria for the study were: unprotected sexual intercourse within the last 72 hours, request for EC, not pregnant and accepting to come for review after three days or to be contacted for follow up. Young women who met the inclusion criteria and agreed to participate were randomized to one of two study groups. One group received the Yuzpe regimen consisting of Lofemenal,

which was the method used as standard EC in all the sites at the time of the study (2005/2006). Lofemenal is a combined oral contraceptive pill that contains ethinyl estradiol 0.03 mg and norgestrel 0.3 mg. Four tablets were taken directly and another four were taken after 12 hours. The other group received levonorgestrel 1.5 mg tablets as a single dose.

Blocked randomization was used. The EC pills were packed in white opaque envelopes, which were numbered at the time of printing. An independent person not involved in the trial packed the tablets. The packaged tablets had labels with instructions for use.

The clients were asked to swallow the pills within 30 minutes after leaving the clinic. The reasons were to (i) ensure uniformity and (ii) further blind the staff so that they would not know who was taking which tablets. Participants were asked to come back for review after three days. When the clients came back for follow up they were interviewed by a non-medical, specially trained research assistant. The outcome variables were side-effects experienced and acceptability of the pills. Prior to the trial, an initial clinical trial run (pilot study) was conducted at the study sites to establish the practicalities of conducting the study.

A questionnaire with closed and open ended questions exploring participants' age, marital status, parity, last normal menstruation, and previous use of contraceptives including ECPs was used. There were specific questions about any side-effects experienced by the women, e.g. vomiting, nausea, fatigue and headache. The side-effects were graded on a Likert scale ranging from 1 (mild) to 5 (severe), as shown in Table 3.

Table 3. The Likert scale that was used to assess side effects.

	Mild					Severe				
a. Nausea	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5
b. Vomiting	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5
c. Bleeding	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5
d. Dizziness	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5
e. Fatigue	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5
f. Headache	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5
g. Pain in calf muscles	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5
h. Others [specify]....									
									

Addendum questions were given to the clients after one year from the time the pills were used. These questions included age of coitarche, intention to use other contraceptives, recommendation of ECPs to other users and age groups that could use EC. Telephone interviews were conducted from September to November 2006. Each interview lasted between 8-14 minutes.

4.3. Data analysis

The qualitative data were analyzed by latent content analysis (paper I). This involves an interpretation of the underlying meaning of the text (Graneheim and Lundman 2004).

After reading through each transcript several times, the answers to the questions included in the FGD and KII guides were put together and constituted the unit of analysis. These were labeled with codes (Graneheim and Lundman 2004). Numerous codes were generated and grouped into categories. A process called constant comparison, which means that each code was checked and compared with the rest of the codes, was used. After the categories were created, themes that connected the codes were identified (Table 4).

Table 4. Example of the method of analysis for the sub-theme: communication with parents is needed but not available.

Texts	Codes	Category	Sub theme
My Dad even fears to tell me about them (ECPs), actually for me I've learnt about them through experience but I think it should be encouraged, I mean the information between the parents and children should be encouraged	Dad fears talking		Communication with parents is needed but not available
You are not free with them, there are very few children who are free with their parents	Parents not free with children	Parents do not talk to children	
Something that a friend tells me or a brother tells me and something that is told to me by a parent, I will actually take it seriously	Peer advice Parental advice	Parental advice carries weight	
I take that thing that has been told to me by a parent more seriously	Parental advice important		
But from a psychological point of view, I believe parents play a significant role in the decision and the development of their children	Parents play big role in development of their children		
You can find a child gets pregnant during the time she is studying and due to the fact that she fears at least to break the news to the parents. She ends up committing suicide	Child gets pregnant, fears to break news to parents	Fear to discuss sensitive issues with parents	
Traditionally culture has affected our parents here in Africa. Most parents fear to talk about sex related issues	African culture make parents fear to talk about sex	Parents fear to discuss sexual issues	
Some of these parents themselves do not know	Inadequate knowledge among parents	Parental knowledge is lacking	

For the quantitative data in paper II, the data were entered into EPINFO V.6 package and exported to Stata Version 8.0 (Stata Corporation, 4905 Lakeway Drive, College Station, Texas 77845 USA). Errors and inconsistencies were checked in EPINFO before exporting the data. The main outcome variables were knowledge of EC, ever use

of contraceptives, and ever use of EC. Analysis involved frequency distribution tables and cross tabulations of age group and halls of residence against the outcome variables. The chi square test was used to calculate significant differences between the different study groups while odds ratio was calculated for being in a sexual relationship and using contraceptives. A p-value of 0.05 or less was considered to be significant.

In paper III, all completed questionnaires were checked for completeness. The computer program Epidata 3.1 (The EpiData Association, Odense Denmark) was used for data entry and the data were exported to Stata version 8.0 for analysis. Consistency and range checks were made and errors were corrected in Epidata before exporting to Stata. The main outcome variable was knowledge of EC. Key independent variables included socio-demographic characteristics and having had an educational update of FP. Analysis involved descriptive statistics like frequency distribution tables and inferential statistical analysis like cross tabulations. Binary logistic regression was used to explore possible relationships between the knowledge of EC and the rest of the variables. The outcome variables for the logistic regression included ever heard about ECs and ever prescribed ECs.

In paper IV, all questionnaires were checked for completeness. Responses from open ended questions were coded. Epidata 3.1 was used for data entry and the data were exported to Stata version 9.2 (StataCorp 4905 Lakeway Drive, College Station, Texas 77845 USA) for analysis. Consistency and range checks were made and errors were corrected in Epidata before exporting the data. The main outcome variables were side-effects and acceptability of ECPs. Key independent variables included socio-demographic characteristics, having discussed with the partner before reporting for EC, previous use of contraceptives, including ECPs, history of having worries about ECPs and having been pregnant before. Analyses involved descriptive statistics and inferential statistical analysis, such as cross tabulations. Pearson's chi square test was used to examine the bivariate relationships between the side-effects in the two groups. Binary logistic regression was used to explore possible relationships between the side-effects of the two regimens and acceptability with the rest of the variables. The

variables for the logistic regression included ever used contraceptives, religion, having worries about the method and discussing with the partner before reporting for ECP. Variables that were not related to either exposure (drug) or outcome (side-effect and acceptability) were not included in the multivariate analysis (controlled for in the analysis). An alpha of five percent was used as the cut-off point.

The open ended questions for papers II, III and IV were coded and the content analyzed manually. The answers were read several times for familiarization with the data, and preliminary categories were created. Boundaries and content of the various categories were examined, some were merged, and thereafter all the statements were referred to as particular categories. Two members of the research team analyzed all statements and descriptions of the codes from the open ended questions.

4.4 Ethical considerations

The study is in line with the Ministry of Health's position of strengthening reproductive health through emergency contraceptives. The study involved young people and also concerns an area in their lives that is considered "most private", that is, issues related to sexual intercourse. The participants in the study were given information about each study and the reasons for the research. No client was refused FP methods or any other form of treatment because of refusal to participate in the study. The information obtained was highly confidential and kept securely. Clients were identified by numbers and not by names. The study was approved by the Department of Obstetrics and Gynecology, Faculty of Medicine Higher Degrees Research and Ethics Committee, National Council for Science and Technology, and the resident district commissioner, Kampala district. Ethical clearance was also obtained from the ethics research committee at Karolinska University Hospital, Stockholm, Sweden, except for study IV, which was obtained only in Uganda. Consent was obtained from the heads of the various clinics before starting the randomized controlled trial. Informed written consent was obtained from all participants prior to inclusion in the study.

5 FINDINGS

This thesis includes studies on users, potential users (women and men), and providers of EC, all of whom interact in one way or another. Four studies involved 1,039 participants, 982 females and 57 males. The majority of the users and potential users were young people, i.e. aged less than 24 years. The mean age for participants in papers II and IV was 22 years (SD 3.5).

5.1 Perception and knowledge

5.1.1 Ambivalence towards ECPs

The main theme that emerged from paper I was ambivalence towards ECPs.

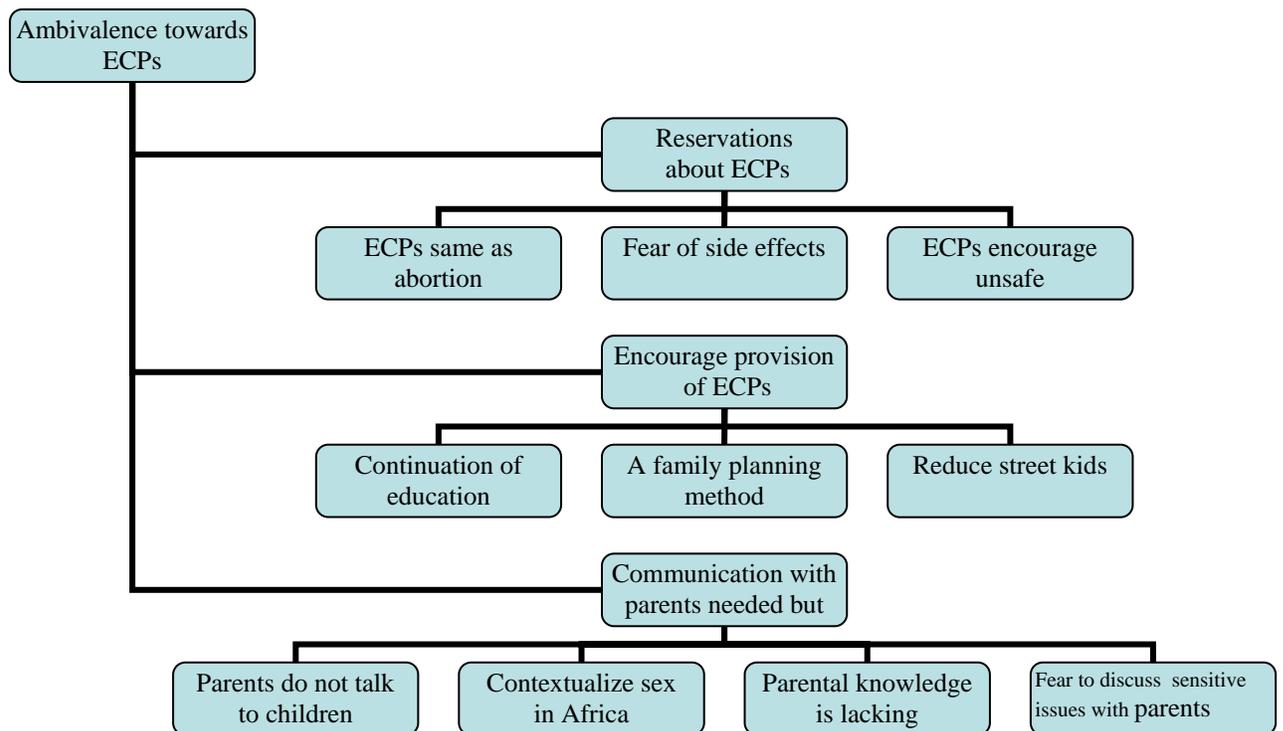


Figure 4. Chart showing the main theme, sub-themes and categories extracted from the texts (Paper I)

The sub-themes were: ‘reservations about ECPs encourage provision of ECPs’ and ‘communication with parents needed but not available’. There were several categories under each sub-theme.

In many of the focus group discussions the participants showed mixed reactions about EC. They would on one hand, encourage use and on the other hand hesitate on full-scale use, as illustrated in the following quote:

“Although I prefer that they give the ECPs to ladies or women, but then to some extent I disagree...”

Ambivalence towards EC was reflected throughout the results in paper I (Figure 4), not only in the categories but also in the sub-themes. Encouraging use of ECPs was usually followed by nuances of hesitation. Young people are faced with the temptation to have sex, but are aware that this would subject them to the risk of unwanted pregnancy, as well as sexually transmitted infections (STIs), including HIV. The participants indicated that induced abortions were taking place among students and at times with fatal consequences. This was a reason for availing contraceptives, not only to save lives but also to assist students to continue with education. The categories were externally heterogeneous (different), but internally homogeneous, and shadows of mixed reactions could still be seen in the texts. Encouraging provision of EC was surrounded by reservations about the methods used and how ECPs act. The data also indicate the ambivalence in relation to communication with parents. On the one hand, parental advice was considered very important and valuable, but on the other hand parents were said to fear communication with their children about EC. Encouraging provision of ECPs was thus sandwiched by reservations about EC, for example, the risk of encouraging unsafe sexual behavior and by the lack of communication with parents.

5.1.2 Reservations about ECPs (I)

There were reservations about ECPs mainly related to the participant views that ECP was similar to abortion, the participant's fear of side-effects, and the views that there was a risk that ECPs might encourage unsafe sexual behavior (paper I). Many of the participants were not certain about when exactly ECs should be used. They had different

views of how EC pills work to prevent pregnancy. Some of the responses centered on inhibiting implantation as in the following example:

“It is intended to kill the cells so that they should not become active to form the fetus” (male, mixed FGD).

Other participants believed that ECP is similar to abortion, as shown in the following quote.

“There is a way they (ECPs) dissolve the embryo which would have come up, they dissolve it and then they pass it out” (female, mixed FGD).

Local herbs used as abortifacients were mentioned and compared to EC. They included Ruhoko (*Phytolacca dodecandra*, family *Phytolaccaceae*) and Mururuza (*vernonia amygalina*, family *Asteraceae*). These are taken orally in liquid form. Abortion was referred to as something dangerous and hence some participants thought EC was a better alternative.

The A (abstinence), B (being faithful) and C (condom use) strategy for HIV prevention was re-echoed either wholly or in parts during the discussions (paper I). The participants thus feared that the availability of ECs could encourage promiscuous behavior and reduce the use of condoms, which would then increase HIV transmission.

“...it will encourage ... promiscuous behavior, a girl will just move out, sleep with a guy, after that (she) rushes for the pill, the following day the same story just like that...” (FGD females).

Furthermore, in most FGDs, and also among the KIs, it was mentioned that students seemed to be more worried about pregnancy than HIV/AIDS and other STIs (paper I).

“Something, which I have discovered after interacting with a sizeable part of my constituency, most students are not very worried about AIDS. Most of them are worried about pregnancy” (KI).

According to the students, it was a risk that ECPs, which only prevent pregnancy, would increase STIs if condoms were not used as well.

5.1.3 Views about provision of ECPs (I and III)

In paper **I**, it was a general view that ECPs should be provided because they have a number of advantages. Both the KIs and the FGD participants reiterated that EC should be given to the “right” people. The issue of age—being 18 years and above—was re-echoed. The participants were aware that young people have sex but that this is due to “moral decay”. They discussed that adolescents before the consent age are not yet “ready” to have sex, as in the following quote:

“But we can say, let it (EC) be given to the right people. The right people, who are ready to have sex, maybe people who are above eighteen. That’s my point” (KI).

However, some participants said that ECP should be viewed as any other type of contraceptive method and that the provision of ECP was good since young people could then continue their education. Furthermore, it was highlighted that some male students, who impregnate fellow students or women in the slums, leave their offspring, who then become street children. It was considered that providing ECP could thus be a way of reducing unwanted children, who are not looked after properly.

In paper **III**, the providers gave various suggestions ranging from encouraging use to those who wanted restriction of the ECP. However, slightly more than half (53.3 %) wanted to make the population sensitized about EC issues. About 28 percent wanted EC available and accessible in convenient places for all. Only four percent wanted the ECPs

restricted legally. Some HCWs expressed need for more training, such as seminars in FP methods.

5.1.4 Knowledge of emergency contraception by users and providers (II, III)

Less than half (45.1%) of the students had ever heard about EC (paper **II**). Knowledge of the mechanism of action of EC was poor and one of every three of the students believed that EC would interrupt an ongoing pregnancy. They also expressed uncertainty about the time limit within which the pills can work. One in every five students believed that the pills could work up to a maximum of 24 hours. There was no statistically significant difference between knowledge of EC and age groups (p value 0.66). The greatest possible source for the EC pills was pharmacies (29.1%), youth clinic (19.2%) and university health unit (12.3%) (paper **II**).

Most of the providers (79.4%), who in this thesis were HCWs, had heard about EC (paper **III**). The combined oral contraceptive pills (the so-called Yuzpe regimen) were the most commonly mentioned method for EC. However, approximately one in four (24.1%) of the providers did not know the time limit within which EC is effective. The majority of the participants (66.2%) had not had any educational updates about FP methods in the twelve months prior to the study. A significant difference in awareness of EC between participants who had had an educational update in FP in the last twelve months, and those who had not, was noted (p value 0.005). There was, however, no significant relation between having ever heard about EC and age (p value 0.914).

The main sources of information for the students were friends, the media and school (paper **II**). One in every three students had got the information from friends and one in every four from the media. Posters were mentioned among the other sources.

Fifty percent of the HCWs had got information from either a physician (26.4%) or from the training school (24%). Friends, the print and electronic media were mentioned as

other important sources of information. Two of the providers (0.6%) had first heard about EC from their patients (paper **III**).

Mistaking other drugs for ECs was found among the providers (paper **III**). Gynomin (contains methyloestradiol 0.3mg, methyloestrenolone 0.5 mg and is used in treatment of secondary amenorrhea), which is not an EC, was not only mentioned by the HCWs as an EC, but it had also been prescribed.

5.2 Accessibility, distribution and prescription (I, II and III)

The venues suggested where ECs should be availed varied considerably and included the nurse or midwife's office (25.2%), FP clinics (22.1%), pharmacy OTC (17,9%), general practitioner (15.8%), youth clinics (13%) and others (6%). More than one option could be given. The participants were skeptical about the availability of ECP over the counter because of fear of misuse and side-effects (paper **I**).

In paper **II**, the participants were asked whether they thought ECP should be sold over OTC without prescription. Of the 374 who answered this question, the majority 237 (63.4%), were not in favor of OTC use. Many reasons were given for this and included fear of misuse (30.8%), risk of complications (24.9%), need for more information before selling them as OTC (18.4%), increased risky behavior/moral decay (12.5%), and fear of side-effects (7%).

One in every two HCWs (53.8%) was in favor of advance provision of EC. Fifty-four percent thought condom use would decline if clients were aware of EC (paper **III**).

Almost half (49%) of the participants who knew about EC had prescribed it in one form or another and one in every ten had prescribed ECPs in the previous twelve months (11.9%). The most common method prescribed was the Yuzpe regimen (73.5 %). Other methods prescribed or dispensed for EC were the progestin-only pills (8.8 %) and the IUD (2.9%). About 78 percent of the participants said they would increase prescription if they had more knowledge about EC.

5.3 Knowledge of fertile period in the menstrual cycle and use of contraceptives (II and IV)

Knowledge about the fertile period in the menstrual cycle was limited. There was more fertility awareness among those staying within the main campus compared to those staying outside campus (p value 0.006) (paper **II**). Among the methods of contraception used, condoms and coitus interruptus were the most common. In paper **II**, only seven students had ever used ECPs. Of these, two had used it more than once. Some participants had switched methods, i.e. had used one method and then changed to another. The reasons given were that they needed a more efficient method, convenience or that the relationship had become steady. Respondents who were in a sexual relationship were eight times more likely to be using contraceptives than those who were not (odds ratio 8.1. 95% CI: 3.77-18.14). (The odds ratio is 0.3986 for those who were in a relationship and 0.04931 for those who were not.)

In paper **IV**, which was specifically designed to study side-effects of ECPs among the users, most of the participants (81%) were prime ECP users. The rest had used it between one and four times before. The most common reason (38%) for using ECP was unprotected sexual intercourse. The reasons given for having unprotected sexual intercourse were: wanted “live sex”, no condoms available, forgot to use condoms and was drunk. Forgetting to take the conventional pills was the other major reason given, followed by condom accidents and rape.

The majority of the participants (85.2%) indicated that they would want to use another method of contraception in the future. Most of them (37.3%) indicated the condom followed by the combined pills (22.2%) and depot medroxy progesterone acetate (DMPA) (11.9%). Other methods mentioned included the rhythm method, Norplant, IUD, progestin-only pills, or diaphragm.

5.4 Side-effects as perceived and experienced by the participants (I and IV)

Fear of side-effects was commonly mentioned in the FGDs in paper **I**, ranging from immediate fears for feeling weak to long-term effects such as infertility later in life, or if there was conception, the risk of delivering an abnormal baby, as indicated below.

“...you might have an abnormal baby or a baby that has a poor brain growth...it can lead to this type of stunted children... (FGD males).

In paper **IV**, side-effects were experienced both in the LNG group and in the Yuzpe regimen group. The side-effects were more common (71.9%) in the group receiving the Yuzpe regimen (compared to 53.3% in the LNG regimen) and the difference was statistically significant ($p < 0.001$). The way participants experienced nausea varied significantly in the groups (p value 0.001). Important to note was that the side-effects seemed to be more severe in the Yuzpe regimen group compared to the LNG regimen group. Another side-effect experienced was increased appetite after taking the pills.

5.5 Role of young people in provision of EC (II)

We asked participants about the role young people could play in provision of EC (paper **II**). Of the 191 who answered this question, 61 percent were in favor of youth participating in education and provision of information to their peers. Thirty-nine percent were not in favor of youth being involved at all. Some of the reasons given for the negative perspectives included statements such as “the method is only for married people”, that “abstinence should be encouraged” and “the young people should discourage others from using EC”.

5.6 Role of parents in emergency contraception use (I and II)

In paper **I**, parents were mentioned as an occasional source of ECs and this support from parents was followed further to find out whether the participants actually discussed EC with their parents. In most of the FGDs, it was mentioned that in the African context it is

difficult for parents to discuss issues concerning sex and contraception with their children. Parents do not talk to children, as indicated in the following quote:

“...There are very few children who are free with their parents, who even sit and talk and say ‘I have a boyfriend’ or ‘Mummy, what is going on?’. Even when a daughter is almost menstruating, these parents can’t even get a pad to demonstrate what you should do; do you think she will tell you what you are supposed to do with the pill?” (female, mixed FGD).

Fear to discuss sensitive issues with parents was highlighted and was, at times, detrimental.

“You can find that a child gets pregnant during the time when she is studying and due to the fact that she fears to break the news to the parents, she ends up committing suicide” (FGD males).

It was considered important to look at parental communication about sex in the African context, where sex is considered as something secret. Parents were also said to lack knowledge about sexual and reproductive health issues. Although some parents were said to act as commanders instilling fear into their children, many participants said that the parents should talk to their children because a child is likely to accept and follow parental advice. The participants who had discussed EC and other sex-related issues with their parents were happy and recommended it for others.

Of the 291 students answering the question about parents’ role in paper **II**, the majority, 267 (92%) mentioned that parents had a role to play, i.e. to either encourage or discourage use. Every other student (47.4%) said that parents should participate by either educating or advising the youth about EC. Sixty three (21.6%) students said that parents should be free/open about such matters as EC. Some students even said that parents should buy the pills for their children (8.9%). However, some students believed that the

parents should encourage abstinence (11.7%), be very strict to their children (2.1%), or even that the parents had no role at all in relation to EC (5.5%).

5.7 Acceptability and utilization (IV)

Acceptability and utilization of EC was studied in paper IV. Most of the clients (88.3%) said they would use the methods again if there was need. Those who did not want to use EC again cited fear of side-effects as the major reason. The reasons given for not wanting to use EC again were: limited time within which the method is effective, difficulty in swallowing the many pills in the Yuzpe regimen, fear of drugs and costs.

Table 5. Reasons for seeking emergency contraceptive pills.

	LNG % (n=73)	Yuzpe %(n=80)	Total % (n=153)
No contraceptive method used	35.6	40.0	37.9
Forgot pills	24.7	32.5	28.8
Condom accident	26.0	17.5	21.6
Rape	8.2	3.8	5.9
Miscounted days	0.0	2.5	1.3
Failed withdrawal	0.0	1.3	0.7
Missed DMPA	1.4	0.0	0.7
Others	4.1	2.5	3.3

The majority of participants (91.3%) wanted ECPs availed over the whole country. Those who didn't want ECPs availed over the whole country mentioned the following reasons: risk of immorality, fear of side-effects, not user friendly, and not enough information available about ECPs (paper IV). The participants (291) would recommend the method for use by other clients mainly because of the effectiveness against pregnancy (53%) and no side-effects (52.6%). Others wanted more education about the method (12.4%) and some reported that the number of tablets were too many (2.1%). There was no significant relationship between religion and either EC acceptability or recommendations.

There was a statistically significant association between having worries about the method and experiencing the side-effects (p-value 0.001). The most common worries mentioned were fear of side-effects (55%) and uncertainty about the effectiveness (36.6%) of the method. Other reasons included fear that another person would find out (parent or boyfriend, in cases where they were not supportive), too many tablets to swallow and fear of STIs. In multiple regression analysis (Table 6) and after controlling for education and ever use of contraceptives, having worries increased the likelihood of having side-effects by 3.5. This implies a strong independent effect of having worries about side-effects.

Table 6 Bivariate and multivariate logistic regression of having side-effects and having worries, education and ever used contraceptives.

Variables	Bivariate		Multivariate	
	OR	95%CI	OR	95%CI
Having worries	2.69	1.67-4.35	3.46*	2.06-5.82
Education				
None/primary 4	1		1	
Primary 5-7	0.56	0.17-1.85	0.71	0.20-2.46
Secondary	0.59	0.20-1.70	0.66	0.22-2.01
Tertiary	0.42	0.15-1.24	0.36	0.12-1.09
Ever used contraceptives				
Yes	1		1	
No	0.85	0.53-1.38	0.69	0.41-1.17

* P<0.001

6 DISCUSSION

6.1 Methodological considerations

The thesis combines both qualitative and quantitative philosophies.

6.1.1 Sampling techniques

In this thesis both probability and purposive sampling methods were used. Purposive sampling was used in paper **I**, while systematic and probability proportional to size (PPS) techniques of sampling were applied to papers **II** and **III**, respectively.

Purposive sampling means that subjects are selected because of some characteristic (Patton 1990). Patton has proposed different types of purposive sampling techniques and the researcher can choose the method most suitable according to the objective of the study to be undertaken. In this thesis (paper **I**), a homogeneous as well as politically important (in terms of university politics because the four key informants were all elected by the students) sample was drawn. In order to capture differences that may result from various settings and backgrounds, the study participants came from different years of study and courses and also from different parts of the country, though they were all young university students.

Systematic sampling, as applied in paper **II**, is a statistical method involving the selection of every k^{th} element from a sampling frame, where k , the sampling interval, is calculated as: $k = \text{population size (N)} / \text{sample size (n)}$. Using this procedure, each element in the population has a known and equal probability of being selected. This makes systematic sampling functionally similar to simple random sampling. It is, however, much more efficient (if variance within systematic sample is more than variance of population) and much less expensive to carry out. The researcher must ensure that the chosen sampling interval does not hide a pattern. Any pattern would threaten randomness. A random starting point must also be selected, in our case this was the fourth student. Because of this, some authors have called this technique mixed sampling (random at the start and then systematic) (Kumar 2005). Systematic sampling should be applied only if the given

population is logically homogeneous, such as university students, because systematic sample units are uniformly distributed over the population.

In paper **III**, the PPS sampling technique was used. According to this technique, the more health workers a HCU has the higher the chances of being selected into the sample. With PPS the selection interval and the first random number are important starting steps. A list of all HCUs in Kampala city council with the total number of staff at each unit was generated before the study started. Thereafter, the cumulative number of staff in the HCU was calculated. Using the cumulative number of staff, systematic sampling was used to select the desired number of HCUs. Systematic sampling involved getting a random start number and a selection interval (r). From then on, every r^{th} HCU was selected. In our study, the random starting number was seven, which corresponded with a clinic in Makindye division.

6.1.2 Validity and trustworthiness

To show trustworthiness in qualitative inquiry the authors should include information that can support the argument that the findings are “worth paying attention to” (Lincoln 1985). The different aspects of trustworthiness in qualitative research include: credibility, transferability, dependability and confirmability. Credibility (internal validity) refers to the authenticity or truth value of the research: how well all the steps during the data collection and process of analysis have addressed the intended focus of the study. We kept our focus on the objective, which was to explore the perceptions of the university students about EC. The FGDs were all conducted in English and the research team had meetings after every FGD. Each FGD was transcribed verbatim, also indicating episodes of other events such as laughter in the transcription. The principal investigator conducted all the FGDs with a trained note-taker. Triangulation is a technique for enhancing credibility and refers to obtaining diverse views on the same phenomenon for the purpose of validating conclusions (Dahlgren 2004). It enhances credibility by comparing and cross-checking the consistency of obtained information. There are five types of triangulation: data, investigator, theory, methodological and unit of analysis triangulation

(Patton 2002). In our research, we used qualitative and quantitative data collection methods, hence applying methodological triangulation. We also used different qualitative data collection methods such as FGDs and KIIs. Furthermore, investigator triangulation was used in all the studies (papers **I – IV**). Transferability (external validity) refers to the extent to which the findings can be transferred to other settings and groups. In our study, which was conducted in one university, the results would apply to other university settings, not only in Uganda, but also in other similar countries. Dependability refers to whether the research findings are consistent and reliable. It refers to the stability or consistency of data over time, that is, researchers do not lose track during data collection and analysis. In this study, transcription of each FGD and KII were done shortly after the discussion/interview and reviewed to make sure no information was missed. Confirmability addresses neutrality of the qualitative data rather than of the researcher, and should ensure that the conclusion is derived from the data. The conclusion should represent those being studied (Dahlgren 2004). In paper **I**, a number of quotes are presented in order for the reader to judge how the data has been analyzed, as well the accuracy of the conclusions drawn.

In quantitative research, terms such as validity, reliability, objectivity and generalizability are more often used. Validity has two distinct fields of application. The first involves test validity, a concept that has evolved within the field of psychometrics and simply refers to the degree to which a test measures what it was designed to measure. The second involves research design. Here, the term refers to the degree to which a study supports the intended conclusion drawn from the results. In paper **II, III** and **IV**, the conclusions were drawn from the results obtained from our research findings. Reliability refers to the consistency of a set of measurements or measuring instrument. This can either be whether the measurements of the same instrument through a test-retest give or are likely to give the same results, or in the case of more subjective instruments, whether two independent assessors give similar scores (inter-rater reliability, at times called inter-rater agreement). In this thesis, both aspects of reliability have been applied. The inter-rater reliability was applied to the analysis of the open ended questions in studies **II, III** and **IV**. Objectivity refers to impartiality or neutrality. The researchers and the studies were neutral and

unbiased. Generalizability (external validity) refers to the degree to which the results of a study or systematic review can be extrapolated to other circumstances, in particular to routine health care situations. Another term, which has been used, is applicability. Our findings can be applied to the health care system in the country. The findings can also help in designing messages to the users of EC and in designing FP educational updates for the health care workers (paper **III**).

Research assistants were trained to ensure that they fully understood the study and the meaning of each question. The questionnaires were pre-tested, reviewed and adjusted. All questionnaires were reviewed daily by the principal investigator to ensure consistency and reliability of answers. The questionnaires were fully filled-in to ensure completeness of information. The principle investigator and one research assistant conducted all the focus group discussions. Debriefing meetings were held at the end of each day of data collection. In this way, we kept the data collection in focus and ensured quality at this stage.

In paper **IV**, logistic regression was used. Logistic regression has advantages over linear regression in that it does not assume a linear relationship between dependent and independent variables, it does not require the dependent variable or error terms to be normally distributed, it does not demand homogeneity of variances and it does not need observations to be independent. Logistic regression quantifies the association between a risk factor (or treatment as in paper **IV**) and a disease or the side-effects, (as in paper **IV**) after adjusting for other variables (Motulsky 1995). The logistic regression assumptions made in Study **IV** included the following: the subjects were randomly selected from the population and were representative of a larger population. Each subject was selected independently of others. Knowing the outcome of any one subject would not help us predict the outcome of any other subject. Logistic regression is used when there is a categorically dependent variable and a number of numerical or categorical explanatory variables. It is usually recommended to assess the goodness of fit of the models (Hosmer, Taber et al. 1991). This was done in paper **IV**.

6.1.3 Intention- to- treat analysis

Intention To Treat is a strategy for the analysis of randomized controlled trials in which all the participants in a trial area are analyzed according to the intervention to which they were allocated, whether they received it or not (Hollis and Campbell 1999). This strategy was used in paper **IV**. Having given the participants ECP to take within 30 minutes would not necessarily mean that they took the pills. Intention-to-treat analyses are favored in assessments because they mirror the non-compliance and treatment changes that are likely to occur when the intervention is used in practice and because of the risk of attrition bias when participants are excluded from the analysis. Another analytical strategy used in randomized trials is to analyze according-to-protocol. In analysis according to protocol, the subjects are compared according to the treatment actually received. It also includes subjects who properly followed the protocol.

6.2 Appraisal of the findings

Various important findings are reflected in these studies. From our findings, limited knowledge may lead to the limited use and prescription of ECs. Misunderstanding or misconception can lead to incorrect timing of the use of EC, as well as increase the experienced side-effects. Peers may play a role in sharing sexual and reproductive health information but this does not have as much impact as parental guidance.

6.2.1 Limited knowledge - limited prescription and utilization

In papers **I** and **II**, the awareness about EC was low (45.1%) and so was fertility awareness. However, the level of awareness was slightly higher than the level found among university students in Kenya (39%) and Ghana (43.2%) (Muia, Ellertson et al. 1999; Baiden, Awini et al. 2002). The poor knowledge may influence perception of the clients about the ECPs. For example using EC was mistaken as being similar to inducing an abortion (papers **I** and **III**).

Our findings (paper **III**) agree with what has been found by other researchers (Adekunle, Arowojolu et al. 2000; Hariparsad 2001; Mandiracioglu, Mevsim et al. 2003; Tripathi, Rathore et al. 2003; Brunton and Beal 2006; Sevil, Yanikkerem et al. 2006). Studies have shown that knowledge about the exact mode of action, time of taking the pills is usually

poor among health care providers (Adekunle, Arowojolu et al. 2000; Hariparsad 2001; Tripathi, Rathore et al. 2003; Sevil, Yanikkerem et al. 2006). Lack of accurate information about FP methods can be a medical barrier to provision (Shelton, Angle et al. 1992). The health care workers included in our study had a positive attitude towards provision of EC and were ready for updates. A positive attitude is very important for increasing access of information and availability of the ECPs to the users (Sable, Schwartz et al. 2006).

Both the students and the HCWs mentioned the school as a source of information for EC. It was noted that the knowledge of EC was poor both among the students and the HCWs. It is therefore important to strengthen the pre-service school education regarding RH issues, as well as the in-service training. It is important not to isolate EC from the other contraceptives and RH issues. Providers who participated in in-service training showed changes in perceptions and knowledge about EC (Beckman, Harvey et al. 2001).

Two-thirds of the participants requesting EC had either not used any contraceptive (37.9 %) or forgotten to use the pills (28.8 %). This may reflect the unmet need in the country in terms of method provision and information availability (UBOS 2007). Bongaarts and Bruce analyzed survey and anthropological data on the causes of unmet need for contraception. They observed that the conventional explanation that unmet need is due to inaccessibility of contraceptives is inadequate (Bongaarts and Bruce 1995). The principal reasons for nonuse of contraceptives are lack of knowledge, fear of side-effects, and social and familial disapproval. It has also been observed that some victims of rape or defilement at times do not access ECs despite that EC provision is part of the recommended health care (Das and Huengsberg 2004; Patel, Simons et al. 2004; Finkel, Mian et al. 2005).

6.2.2 Side-effects and utilization of ECPs

Side-effects associated with ECPs include nausea and vomiting, abdominal pain, breast tenderness, headache, dizziness, fatigue and a craving for food (paper IV). Side-effects were experienced with both the Yuzpe and LNG regimen. Some studies have indicated

that use of the antiemetic medicine, meclizine, can reduce vomiting if taken one hour before the Yuzpe regimen (Raymond, Creinin et al. 2000). Some researchers advise the women to take the ECPs with food, although research has shown that this is ineffective in reducing nausea and vomiting (Raymond, Creinin et al. 2000; Ellertson, Webb et al. 2003). Participants' worries about the side-effects caused by contraceptives can be a hindrance to EC use (paper **IV**). This finding has been reiterated in other studies (Knutsen, Furnes et al. 1999; Bartfai 2000). A study done in Kenya indicated that the quality of care in FP improved if clients' concerns about side-effects were addressed (Rutenberg and Watkins 1997).

6.2.3 The role of peers in EC

In this thesis, the aspects of peers are discussed both among the young people (papers **I**, **II** and **IV**) and among the providers (paper **III**). Peers are a common source of information of EC (Olsen, Santarsiero et al. 2002; Selak, Juric et al. 2004; Abasiattai, Umoiyoho et al. 2007). Peers can also influence young people about when to start having sex (Upadhyay and Hindin 2006). Being in a sexual relationship was associated with a higher likelihood of using contraceptives (paper **II**). This has also been found in other studies (Kosunen and Laippala 1996; Gleit 1999; Manning, Longmore et al. 2000). At times the information about EC is obtained from peers (Bastianelli, Farris et al. 2005). The formal communication channels usually lag behind. It has been shown that contraceptive use can be improved by linking formal information channels to informal gossip networks (Rutenberg and Watkins 1997). At the peer-providers level, counseling women on emergency contraception when discussing contraceptive methods is advised (CTU 2000).

6.2.4 Fertility awareness and health education in schools

Our findings indicated that fertility awareness among the university students included in the study was low (paper **II**). Fertility awareness involves more than basic knowledge about reproductive physiology. It also requires an understanding of basic information about fertility and reproduction, as well as being able to apply it to one's own situation.

Fertility awareness is fundamental to understanding and making informed decisions about reproductive and sexual health (Pyper 1997). Clients would be in a stronger position to make informed decisions about planning pregnancies and understanding how FP methods work, and about how they wish to manage their reproductive and sexual health, if they had better knowledge about fertility. Among all women surveyed in the 2007 UDHS, less than one in five (16 %) knew that a woman is most likely to conceive during the mid-cycle. Almost one-half wrongly believe that the fertile period is right after a woman's menstrual period has ended, while one-fifth of women said they did not know when the fertile period occurs, and ten percent believed that there is no specific fertile period (UBOS 2007). These findings agree with our findings about the poor fertility awareness among university students (paper II). One would expect the knowledge among university students to be higher than in the general population. It is thus important to not only give ECPs, but also to use the chance to counsel clients about sexual and RH issues. This should apply to the information, education and communication messages given to clients (Puri, Hazari et al. 2006). Some students suggest that sexual and health education should be included in the school curriculum (Selak, Juric et al. 2004). Most high income countries have already started sexual health education in schools, with Sweden being the first country in 1955 to make sexual education obligatory.

Interventions can help increase student knowledge about ECs without necessarily increasing its use and reducing friends as the source of information (Larsson, Eurenus et al. 2006). However, for the sexual and RH education programs to be effective, they should be developed through a process of collaboration between families, health care professionals, educators, government officials, and youth themselves (Deligeoroglou, Christopoulos et al. 2006).

6.2.5 Parental guidance and the media; hand in hand is better!

In both papers I and II, parental advice was regarded as important by the young people. Studies have indicated that not only parental advice, but also family structure has a bearing on the behavior of the children. When parents make decisions jointly, sons report delaying first sex (Upadhyay and Hindin 2007). In households where mothers have

higher status, daughters report delayed first sex (Upadhyay and Hindin 2007). Long-term positive effects on children, particularly in delaying first sex, occur in families in which parental decision-making is cooperative and where women have high status (Upadhyay and Hindin 2007). Studies have indicated that parental guidance has a big impact on the sexual and RH of young people (Resnick, Bearman et al. 1997; Bender and Kosunen 2005; Upadhyay, Hindin et al. 2006; Hansen and Skjeldestad 2007; Upadhyay and Hindin 2007).

The studies included in the thesis were carried out in Kampala district and mainly among university students. It has to be pointed out that this is not representative of all the young people in Uganda. Another shortcoming that could have influenced the results significantly is the number of women lost during follow-up in paper **IV**.

6.3 Controversies about emergency contraception

Emergency contraception has been surrounded by controversies about its doses, possible reduced use of regular contraceptives when EC is used, distribution points, sexual behavior among the users, especially young people, and the mechanism of action (Marions and Gemzell Danielsson 2005; Clements and Daley 2006; Kathiravan and Sivalingam 2007).

There have been some worries that the doses of the hormones involved in ECPs are high. Some of these concerns include potentially increased risks of cardiovascular events, worries about possible effects on future fertility, feared teratogenic consequences following method failure or inadvertent use during pregnancy, exaggerated or extreme fears of adverse tolerability, and concerns about drug interactions with other medications. Fears about side-effects such as inability to conceive later in life if one were to use ECPs were expressed (paper **I** and **II**). However, considerable available data on ECP, especially LNG-ECP confirm an excellent safety profile (Norris Turner and Ellertson 2002).

There have also been concerns that when EC is used clients will not use regular contraceptive methods. In our studies the students and HCW thought that use of condoms

would be reduced if the ECP was more available (papers **I** and **III**). In contrast several studies indicate that clients who use ECs will continue to use other contraceptive methods (Haynes 2007; Ziebarth and Hansen 2007).

Emergency contraceptives can be given before there is need (advance provision) or they can be given when a person has already an indication for its use. Health care workers were in favor of advance provision of EC (paper **III**). Previous studies have shown that advance provision increases use (Raine, Harper et al. 2000; Blanchard, Bungay et al. 2003; Jackson, Schwarz et al. 2003) without reducing the use of other contraceptives, e.g. condoms nor increasing unprotected sexual activity (Ellertson, Ambardekar et al. 2001; Gold, Wolford et al. 2004). A recent Cochrane review has shown that providing ECPs in advance to fertile women for use after unprotected sexual intercourse (i.e. advance provision) does not affect pregnancy rates, condom use, STI rates, or type of contraception used, but increases the chance that a woman will use EC when in need. It also reduces the time from sexual intercourse to emergency contraceptive use by about 15 hours (Kripke 2007; Polis, Schaffer et al. 2007), which may improve efficacy.

According to our findings, EC is acceptable and the population should be sensitized about it (papers **I**, **III** and **IV**). After acceptability, accessibility becomes the next critical issue in the chain. Some studies have indicated that access to EC is considered a component of contraceptive services and this is the situation in Uganda, as well. There are, however, a number of barriers to access EC, especially for young people. These include access points and who provides the pills. There are numerous debates about where ECPs should be distributed from OTC, or strictly in clinics. The majority of participants (63.4 %) in study **II** were against OTC availability because of fear of misuse, complications and increase in risky behavior. Almost half of the HCWs (47.3) indicated that EC should be available in FP clinics. One in every five HCWs was of the view that ECP should be available at the pharmacies without prescription. Since there is evidence that neither pharmacy access nor advance provision compromises contraceptive or sexual behavior, it seems unreasonable to restrict ECP access to clinics (Raine, Harper et al. 2005). There were concerns

expressed about the risk of promiscuity or irresponsible sexual behavior if clients used ECPs (papers **I**, **II** and **III**). In areas where STIs are high the concerns are that the users will acquire STIs, including HIV/AIDS. However, as pointed out above, several studies have now shown that EC use does not increase risk of STIs among the users (Stewart, Gold et al. 2003; Fox, Weerasinghe et al. 2004; Haynes 2007).

Concern is usually expressed that ECs are abortifacients. The important point of context is usually the mode of action of the ECPs. Studies have indicated that the Yuzpe regimen mainly inhibits or delays ovulation and may have effects on the endometrium (Trussell and Raymond 1999). Early treatment with ECPs containing only the progestin LNG impairs the ovulatory process and luteal function (Durand, del Carmen Cravioto et al. 2001; Marions, Hultenby et al. 2002; Croxatto, Brache et al. 2004; Marions, Cekan et al. 2004; Durand, Seppala et al. 2005). When given postovulatory LNG-ECP does not affect the endometrial development or function (Marions, Hultenby et al. 2002; do Nascimento, Seppala et al. 2007). It was recently confirmed that LNG-ECP does not affect embryo implantation (Lalitikumar, Lalitikumar et al. 2007).

7 CONCLUSIONS

- Users' and potential-users' perceptions are crucial in the accessibility and utilization of ECPs. The perceptions influence acceptability, and hence, the corresponding recommendations to peers. If a young person has an unpleasant experience in a health care unit, he/she will not recommend the services to the peers.
- Knowledge about EC was quite low among first year female university students. The knowledge is important in countering the misconceptions about EC and other contraceptives.
- Fertility awareness was low among the female first year university students. Knowledge of fertility period is important in determining when conception can occur and this helps young people to avoid unplanned pregnancy.
- Friends and the media are an important source for EC information.
- Most HCWs were aware of EC, but some lacked important knowledge on its use or available methods. The health care providers were, therefore, not an accurate source of information about EC at the time of the study.
- Having worries about the ECPs may influence the experience of side-effects.

8 IMPLICATIONS OF THE RESEARCH

This study compliments the available data on FP methods, in particular ECPs. The qualitative study enriches the understanding of young people's perception of EC in the Ugandan context. Paper **II** brings out the issue of inadequate knowledge about EC and an important point on fertility awareness. The results from paper **III** indicate the need for regular updates in not only EC methods, but also FP in general for health care providers. Paper **IV** indicates that the ECPs are acceptable and that the users would recommend their use to others.

For the policy makers:

- The menstrual cycle with reference to the fertile period should be given more emphasis in schools and institutions so that the young people know when there is a chance /risk of getting pregnant.
- Updates on reproductive health issues including EC should be given regularly to the providers. The updates should be integrated rather than given in a parallel fashion, i.e. EC should be discussed in the milieu of other FP methods and in the context of RH.
- Accurate information (including side-effects and mechanisms of action) should be availed to female university students about EC and other contraceptive methods. This information can be given through their secretaries for health, seminars in halls of residence, for example in the evenings. Information education and communication materials can be supplied, as well.
- Parents should be empowered to be able to discuss sexual and reproductive health issues with their children

For the health care providers

- Health care workers should have regular in-service training regarding reproductive health issues, such as counseling on EC. This will enable them to keep up to date with the current evidence based recommendations in the field of contraceptive technology.
- The expanding media industry in Uganda should be utilized to expand correct messages about EC and other RH related issues.

9 ACKNOWLEDGEMENTS

I am very grateful to my three supervisors, viz Prof Kristina Gemzell-Danielsson, Karolinska Institutet, Dept. of Woman and Child Health, Division of Obstetrics and Gynecology; Associate Prof Elisabeth Faxelid from Karolinska Institutet, Dept. of Public Health sciences, Division of International Health Care Research (IHCAR); and Prof Florence Mirembe from Makerere University Faculty of Medicine, Dept of Obstetrics and Gynecology; for guiding me through the paths involved in writing this thesis. They were a very organized, focused and cheerful team. I am thankful to the various persons who made writing of this thesis manageable either through advice, encouragement, prayer and any other form of support rendered to me: May you be blessed abundantly.

I am very grateful to all the participants in both the qualitative and quantitative studies. Gratitude goes to the following professors: Hans Rosling, Staffan Bergström, Lucie Laflamme and Vinod Diwan, for their encouragement, continued guidance and providing an enabling environment for studying at IHCAR.

Associate Prof Stefan Peterson, the jolly and active coordinator of the MU-KI collaboration who always encouraged me to put into a faster gear. Members of the IHCAR community notably, Birgitta Rubenson, Asli Kulane, Petra Lövestedt, Maissa Al-Adami, Piroska Ösclin, Anna-Mia Ekström, Anette Aronsson, Sarah Thomsen, Annika Johansson and Eva Johansson, thank you for your assistance in various capacities. Anna Stina Ullrich, Gunilla Risberg, Kersti Rådmark, Elisabeth Kavén, Thomas Mellin, Bo Planstedt, Eric Åkerman –who always made IHCAR a conducive place from which to study. Special thanks go to Lena Marions from Karolinska Universitetssjukhuset

The Dean of faculty of Medicine, Prof Nelson Sewankambo, and his associate Deans, Prof Elly Katabira (research) and Sam Luboga (education), thank you for the effective administrative support provided during my Ph.D. study period.

The Graduate School and the dedicated staff, professors: Opuda Asibo; Ellie K Rwakishaya, David Bakibinga, Yusto Kaahwa and their assistants at different times of the Ph.D. study period. Ms Mary Nakyewa, Mr Jones Tumwebaze, Mr Nyeko Lwa, Dr Stephen Kiwuwa-Mpungu and Mr Ronald Kiguba, thank you all for the logistical support.

My colleague, Assoc Prof Pius Okong, who initiated me to Stockholm city, my epicenter for the PhD thesis writing, Lynn Atuyambe my housemate on several occasions with the accompanying qualitative dialoguing, my colleagues Dan K Kaye, Twaha Mutyaba and Jolly Beyeza K who always gave encouragement, I thank you. I am grateful to all students of the MU-KI PhD cohort, who shared a lot of information at IHCAR and Makerere University Medical School, through seminars and meetings.

Professors: H. Sengendo, and J. Kigongo, Drs E. Wamala, K. B. Kiingi, J. Beyaraza and C.P.K. Basalirwa, thank you all for making the philosophy of method course philosophical! My teachers in the intensive Introduction to Qualitative Research (2003) course by Carol Tishelman and Beth Maina Ålberg in Stockholm, thank you. My teachers from the summer course in epidemiology and biostatistics at Umeå University, headed by Prof Stig Wall. Colleagues in this course included Assoc Prof Jerome Kabakyenga of Mbarara University of Science and Technology (MUST), Ashley van Niekerk from South Africa and others. My teachers from Harvard University School of Public Health, and Karolinska Institutet at the summer course on Modern Methods in Biostatistics and Epidemiology in Italy: Marcello Pagano, David WYpij, Rino Belloc, N. Orsini of Stata, and my very senior friend and teacher, Dimitrios Trichopoulos. Thanks to my teachers Professor Stuart J Pocock and others at the Clinical trials course (2005), London School of Hygiene and Tropical Medicine (LSHTM), London.

All my colleagues in the department of Obstetrics and Gynecology, Makerere University/Mulago Hospital, headed by Dr Christine Biryabarema, and more so the staff of Firm B, headed by Okoth Anthony and Sr. Ikokole Jennifer, I thank you for the support.

I am grateful to Sida/SAREC for funding this research, sponsoring the courses and the several trips I had to make. It is thumbs- up for the Makerere University-Karolinska Institutet Research collaboration. Assoc Prof. Hanna Akuffo and Dr Cristina de Carvalho Nicacio, thank you for the exemplary leadership.

I am thankful to Xavier Nsabagasani for reviewing the first paper in this thesis. Thanks also go to Kasasa Simon and Nazarius Mbona for the statistical discussions.

A number of people have inspired me and these include Rick Sullivan, PhD, former head of education at John Hopkins Program for International Education in RH (JHPIEGO)

Baltimore, Maryland USA. Thanks go to Prof J K Milne and Dr Andre Lalonde of Society of Obstetricians and Gynecologists of Canada (SOGC).

My co-investigators in the hormonal contraception and risk of HIV acquisition (HC-HIV) study, headed by Prof Mmiro FA and Roy Mugerwa of FoM, Makerere; Robert Salata of Case Western Reserve University, Cleveland, OH USA and Charles Morrison of Family Health International (FHI), Durham, NC USA, and all hormonal contraception and genital shedding (HOCO GS) staff.

Acting Commissioner RH, Ministry of Health Dr A.K. Mbonye, for the readiness to assist, as he always showed me whenever I went to his office at the MOH headquarters.

My friends, Prof Allan Babugura, Jimmy Twinomugisha, Johnson Bitarabeho, John R. Gumisiriza, Maxim Migisha, David B. Bagorogoza and the J. B. Bulinda family; thank you for your ever encouraging words.

I am grateful to the staff of Busingye Medical Center, especially Dr Robert B Busingye, for performing the administrative duties during the times I was away for the doctoral courses.

Betty Katende, Nanyonjo Robinah, Sentongo Gertrude and other staff in upper Mulago FP clinic; Demeter Namuyobo and Linda at Katego Model FPAU clinic, Staff at Naguru Teenage Health and Information Center, Mrs Zzimula, Isma Mayambala and staff at Kawempe Health Center (research assistants), and John Michael Matovu, Ivan Rwakijuma, Katusiime S, Kyomuhangi A.K and Geoffrey Ddungu. Administrative assistants Maureen Ssekisolo and Adam Atami, I thank you for all your support.

Mr Byarugaba Ben and family, Dr Emmanuel Byaruhanga and family, Zungu Willy, Ali, Kyommy, Pons, Musa, Siri, Kyomu, my brothers and sisters, and our mam, Matilda Kayogoza in Rwene, for her incessant prayers. I am indebted to Mr O.M. Kayogoza, who introduced me to the world of academia and Mzee Boniface Kassa. I am thankful to Placidia B and Hilary B for their moral support and Mugabi Marius for his physical and moral support. Mr S. Kashugyera, Moses Oijuke and family and Mr A. Rwanyekiro and family, thank you for the support.

My family, especially my wife, Counsel Nzaaro Annet, and our children, Ann Akora and Addy Alinda, for they would always make me smile amidst bundles of papers. They would never despair.

I THANK YOU ALL

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Papers I-IV