KNOWLEDGE, ATTITUDES AND PRACTICES ON EMERGENCY CONTRACEPTION AMONG HEALTH CARE PROVIDERS AND MEDICAL STUDENTS IN DAR ES SALAAM.

By

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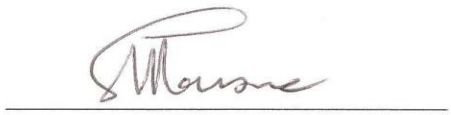
A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Medicine in Obstetrics and Gynecology of the Muhimbili University of Health and Allied Sciences (MUHAS)

Muhimbili University of Health and Allied Sciences

November, 2010

CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance by the Muhimbili University of Health and Allied Sciences a dissertation entitled **"Knowledge, Attitudes and Practice on Emergency Contraception among Health Care Providers and Medical Students in Dar es Salaam-Tanzania"** in partial fulfillment of the requirements for the degree of Master of Medicine in Obstetrics and Gynecology.



Prof. S Massawe

(Supervisor)

Date 29-11-2010

DECLARATION AND COPYRIGHT

I, Dr. Maryam H. Shaki, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any University for a similar or any other degree award.

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Date 25/11/2010

ACKNOWLEDGEMENT

I am grateful and wish to express my sincere thanks to my supervisor Prof. S. Massawe who gave me guidance and support. My heartfelt appreciation is directed to the head of Department Dr. Muganyizi and all the members of the academic staff for their positive inputs and cooperation towards successful completion of this work. Special thanks to Prof. Muhondwa who helped me on questionnaire designing. I would like to extend my gratitude to Dr. R. Mpembeni who assisted me on statistical analysis, Dr. J. Malisa for his assistance, tolerance and always being ready to help. Last but not least, I would like to thank all the health care providers and medical students who willingly agreed to participate in this study.

ABSTRACT

Background: Emergency Contraception (EC) refers to a group of birth control modalities that, when used after an unprotected intercourse within defined time limits, can prevent an unwanted pregnancy. In many low income countries, the lack of knowledge about and access to EC may result in women resorting to unsafe abortions. Health care providers play an important role in making emergency contraceptives (ECs) available to clients. Emergency contraception is particularly appropriate for adolescents because of their patterns of sexual behaviour and contraceptive use.

Objectives: The broad objective of the study was to assess knowledge, attitude and practices on emergency contraception among health care providers and medical students in Dar es Salaam.

Methodology: A cross sectional study was conducted in the public and private health facilities as well as three medical schools in Dar es Salaam, from 22nd October to 20th November 2009. Twelve health facilities of which 3 public municipal hospitals, 3 public health centers, 3 private hospitals and 3 private health centers from each municipality were included in addition to Muhimbili National Hospital. Once the facility was selected, all the health care providers dealing with reproductive health services that were available on the day of data collection were requested to participate. Those who consented to participate were given self administered questionnaires to fill within a 24 to 48 hours period. Medical students from Muhimbili University of Health and Allied Sciences (MUHAS), Hubert Kairuki Memorial University (HKMU) and International Medical and Technological University (IMTU) were included whereby a list of students from each university was used to select the participants randomly. Coding of the open ended questions was done and data cleaning and analysis was done using Epi info 6.

Results: There were 268 health care providers and 300 medical students who responded to the questionnaires. More than half (59%) of the health care providers and 53.7% of the medical students were aware of EC. A lack of knowledge about EC was found as only 30.4% of the health care providers and 32.9% of the medical students were found to have adequate knowledge of EC. EC provision was reported by 31% of the providers and EC utilization was found to be 14.9% among medical students. Majority of health care providers (94.9%) and 90.7% of medical students had positive attitudes towards EC provision and utilization respectively.

Conclusion

The awareness of emergency contraception among health care providers and medical students was found to be moderate (59% vs 53.7%). Despite this, adequate knowledge on emergency contraception on both groups was low (30.4% vs 32.9%). Provision of EC by the health care providers as well as utilization of EC among medical students was found to be low. Majority of the providers and students had positive attitudes towards EC practices i.e. provision among the health care providers as well as EC utilization among the medical students.

9.0: Recommendations

Continuing education programmes about Emergency contraception are required for health care providers to update them with the information regarding EC.

There is a need to provide information about EC together with the reproductive health education in schools to include the young population who are at a high risk of unintended pregnancy.

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List of Abbreviations

AMO	-	Assistant Medical Officer
CO	-	Clinical Officer
EC	-	Emergency Contraception
ECP	-	Emergency Contraception Pills
HKMU	-	Hubert Kairuki Memorial University
IMTU	-	International Medical and Technological University
IUCD	-	Intrauterine contraceptive Device
MO	-	Medical Officer
MUHAS	-	Muhimbili University of Health and Allied Sciences
OBGY	-	Obstetrician/gynecologist
RCH	-	Reproductive and Child Health Services
TDHS	-	Tanzania Demographic and Health Survey
WHO	-	World Health Organization

DEFINITION OF OPERATIONAL TERMS

Adequate knowledge of EC was described as being able to respond correctly to above 60% of the specific knowledge questions which were; types of EC, mechanism of action of EC, effectiveness of EC, timing of the ECPs and IUCD, dosage of the ECPs and interval of taking ECPs.

Attitude- refers to health care providers' and medical students' feelings towards EC, as well as any preconceived ideas that they may have towards it.

Knowledge - refers to their understanding of Emergency contraception.

Practice- refers to the ways in which the health care providers demonstrate their knowledge and attitudes through EC provision and medical students through EC utilization.

Unintended pregnancy is defined as unplanned pregnancy.

Unwanted pregnancy is undesired pregnancy, not needed or unwelcome which results from unplanned pregnancy.

Unsafe abortion is a procedure for terminating an unwanted pregnancy either by persons lacking necessary skills or in an environment lacking the minimal medical standards or both (WHO, 1992)

1.0: INTRODUCTION

1.1: BACKGROUND

Emergency Contraception (EC) refers to a group of birth control modalities that, when used after an unprotected intercourse within defined time limits, can prevent an unwanted pregnancy. It has been available since 1974, but it is not easily accessible in many low income countries. [1]Emergency Contraception is also largely underutilized world wide and has been referred to as one of the best kept secrets in Reproductive Health (RH) of the 20th century. [1, 2]

In many low income countries, the lack of knowledge about and access to EC may result in women resorting to unsafe abortions, which contribute significantly to maternal morbidity and mortality. [2] Globally maternal deaths due to complications of unsafe abortion have been reported to increase from 13% to 20%, apart from the ten thousands who suffer the long-term health consequences including infertility.[3] In Tanzania, Ilala District Dar es Salaam, Urassa et al (1996) found that unsafe abortion was responsible for 15% of the maternal deaths.[4] Given increasing adolescent sexual activity and decreasing age at first sex in developing countries, [5] the use of contraceptives to prevent unwanted pregnancy and unsafe abortion is especially important. Emergency contraception can be used as a measure to reduce the number of unwanted pregnancies and, hence unsafe abortions. [6] Jones et al. (2002) estimated that the use of emergency contraception prevented more than 50,000 abortions in the year 2000, and accounted for 43% of the total decrease in the abortion rate between 1994 and 2000 in US. [7]

EC should be available to women who had forced intercourse (rape), women who have had unexpected sexual intercourse without contraceptive protection or have had a contraceptive failure such as condom breakage. [8] The World Health Organization Medical Eligibility Criteria for Contraceptive Use advice that there are no medical contraindications to the use of hormonal ECs.[9] However, contraindications to postcoital use of a Copper IUCD are existing pelvic infection and distortion of the uterine cavity.

In Tanzania, modern contraceptive prevalence rate is low (26%) with only 20% of married women using modern contraceptives. [10] The low prevalence of modern contraceptive use

reflects a magnitude of unplanned or unintended pregnancy which has an increased possibility of becoming unwanted and therefore ending up with induced abortions. [11]

Health care providers play an important role in making emergency contraceptives (ECs) available to clients. They can increase access to EC through counselling clients, prescribing or advocacy. [1] However, health care providers have, at times, been blamed for the difficulties encountered by clients in accessing ECs, either because of negative attitudes towards ECs or lack of accurate information about these methods. [12]Emergency contraception is particularly appropriate for adolescents because of their patterns of sexual behaviour and contraceptive use. Unfortunately, adolescents begin sexual activity before using contraception, and the first time may be unplanned. Adolescents may also engage in infrequent sexual intercourse with no contraceptive protection [13] this also applies to the young adults including college or university students. Being the potential users of EC, they must know about it and know how to use it correctly in order to improve its utilization.

Although there is no evidence that the ECP prevents implantation of a fertilized egg, religious groups who believe that life begins at fertilization oppose the availability of EC on this theoretical possibility, equating it with abortion. [8] This misconception can have a very big negative impact on the providers as well as the potential users regarding provision and utilization of EC. It is therefore important that the level of knowledge of and attitudes towards EC detected, and accurate information associated with emergency contraception is provided to all.

In Tanzania, EC has been implicated under family planning services. It is used in the form of the usual oral contraceptive pills in appropriate doses. IUCD is also available as a form of EC. There is a special package of ECPs known as Postinor – 2 which is a progestogen only pill. Family planning services in this country are provided to clients by nurses or midwives who are the care providers at these facilities. Pills can also be obtained from pharmacies without a prescription. However utilization of ECPs has been reported to be very low probably due to lack of awareness among the healthcare providers and the potential users of the method.

Advocacy is needed for the providers and potential users (clients) of EC to improve its utilization.

1.2: LITERATURE REVIEW

Several researches have examined the knowledge, attitudes and practice patterns of obstetrician and gynecologists, family planning specialists, general practitioners, nurses and family medicine providers and university or college students on the other hand.

Overall awareness of hormonal emergency contraception was low among health care providers and clients in Mexico City, and specific knowledge about the method was even lower. The use of emergency contraception was mostly supported by clients than providers. [14]

A study was done among providers at a military treatment facility USA (2008), revealed a lack of knowledge of ECP among providers. Slightly more than half (54%) of the providers have prescribed EC and positive attitude was found more in those who prescribed it.[15]

In Vietnam, familiarity with EC and positive attitude towards its practice was found among most of the providers but many lacked accurate and adequate knowledge about method use, contraindications and potential side effects. The importance of more empirical information about the safety and efficacy of the EC methods was stressed, however they cautioned the degree to which EC methods should be made readily available to women in Vietnam. [16]

Researchers have found awareness of EC among health care providers to be high in Turkey, (90%) but detailed knowledge about this method was lacking among many providers. EC use was not supported by many providers fearing that the use of regular contraceptives will decrease if people would know about emergency contraception and also feared that disseminating information about this method would encourage young people to participate in risky sexual behavior and hence lead to increased rates of sexually transmitted infections. Regarding the young people, many providers felt that they should not know about EC. [17]

EC has been prescribed by many family medicine providers (74%). Majority of the providers were familiar with indications (96%) and protocols (78%) for prescribing EC, still knowledge gaps were identified and the overall attitudes regarding EC were positive. [18] In Carribean, it was found that most of the providers (pharmacists, general practitioners, obstetrician/gynecologists and nurses) had heard of ECP and had dispensed it. Few of the

providers had accurate knowledge regarding the time frame for ECP. Twenty five percent had a positive attitude on the over the counter availability of EC and half of them were concerned with the encouragement of sexual risk taking behavior leading to an increase in STI transmission. [19]

In Kenya more providers from private sector (80%) were aware of EC compared to those from public sector (35%). EC was offered more by private sector providers (46%) compared to 4% of public sector providers. Majority of them supported the use of EC while few of them considered it as an abortifacient. Some providers felt that the use of condoms will decrease and hence an increase in STDs including HIV as well as misuse of the method if people were to know about EC. [21]In a study among nurses and nursing students in Nairobi, Kenya in 1998, over 95% knew at least one regular contraceptive method. Familiarity with EC was found in 48.7% of the respondents with a big number of nursing students being familiar with EC than qualified nurses. The level of knowledge about the types of EC, applications, mode of action and side effects was poor and 49% of the respondents considered EC as an abortifacient. Only 21% approved the use by school-aged girls and adolescents. More than half of were concerned about immorality, risky sexual behavior, premarital sex, and carelessness, especially among younger people if they were to know about EC. [22]In Uganda it was found that awareness of EC among health care workers was high (80%) however some knowledge gaps were identified. Almost half (49%) of the participants who knew about EC had prescribed it in one form or another. Overall attitudes towards EC were positive, however slightly more than half (54%) thought that condom use would decline if clients were aware of EC [1]

Regarding knowledge of, attitudes towards and use of EC among students, studies have been done in different parts of the world and revealed different levels of knowledge, attitude and utilization of this method among the students. Most of the studies have been done among female students. A study done in USA among graduate and undergraduate students found that most students were aware of ECP, however they lacked detailed knowledge, which did contribute to health and ethical misgivings about the regimen. Approval of ECP was

widespread and unrelated to the respondent's sex or age but does depend on political and religious views. [23]

In India, a study was done among female college students and found that the level of awareness of EC was 7.3%. Majority (73%) knew that they were in the form of pills while 14.9% knew IUD to be used as an emergency contraceptive method. Only 14.7% knew that a woman should take the ECP within 72 hours of unprotected sex. [24]

Different studies which have been done among undergraduate female students revealed that more than half of the participants were aware of the EC. The major source of information was from friends. The utilization rate of EC was found to be low. Knowledge of EC was significant among those who were sexually active and with history of contraceptive use in most studies. [5, 25] In Ghana, Baiden et al (2002) found the awareness regarding EC to be 11.9% among university students [6] while Ikeme et al,(2005) found that 61% of the female undergraduates in Nigeria had heard of emergency contraception and only 31% had actually used it. The most common source of information about emergency contraceptive pills was from friends and teachers. [26]

Kebede et al (2006) found that awareness as well as utilization rate of EC was very poor among university students in Ethiopia. Students who were in a health field, married or divorced had a significant effect on knowledge of EC compared to their counterparts. [27]

Similar study was done among female university students in Uganda and found that less than half of the students (45.1%) had ever heard about emergency contraceptive pills and many lacked a detailed knowledge about EC, the major source of information was found to be friends (34%),. The rate of usage of ECPs was very low as only 7.4% of the students had ever used ECPs and attitude towards over the counter (OTC) availability of EC was negative for most of the students. [2]

In Tanzania, a study has revealed a low level of knowledge about EC among students in a teaching college. EC utilization was found to be 16.8%. Different reasons given for using EC were contraceptive failure such as condom breakage or slipping, withdrawal failure or not using contraception. Family planning clinics was the most preferred source of EC. [28]

Overall, most studies especially those done in developing countries, have indicated poor knowledge of EC among health care providers as well as university and or college students, though in some studies awareness was found to be high.

2.1: PROBLEM STATEMENT

Access to Family Planning services including EC will help to reduce maternal mortality and morbidity due to complications of unsafe abortions following unwanted pregnancies. Despite this importance, Emergency Contraception is also largely underutilized world wide either because of negative attitudes towards ECs or lack of accurate information about these methods to both the providers and the potential users.

Several studies which have been done elsewhere on knowledge, attitudes and practices on EC among health care providers and college or university students have indicated a lack of knowledge as well as low provision and utilization rates of this useful way of preventing unintended pregnancies.

2.2: RATIONALE

Since the society rely on the health care providers for information and provision of birth control services, health care providers can improve awareness and utilization of EC among their potential users through counseling, prescribing or advocacy. Furthermore, medical students being the future health care providers, mostly being young adults, they are also the potential users of EC as they are at risk of unintended pregnancies.

Therefore determining and improving the knowledge, attitudes and practices of EC among health-care providers and the medical students could be an important strategy in planning for means of increasing the use of EC which will ultimately contribute to the reduction of unintended pregnancies and hence maternal morbidity and mortality due to unsafe abortions. To date, no such study has been done in our country

It is the aim of this study therefore, to determine knowledge, attitudes and practices relating to EC among health care providers and medical students and thereafter recommend on the ways to improve it in order to contribute to the reduction of unintended pregnancies and unsafe abortions with their complications in our country.

2.3: Study Hypothesis

Health care providers and medical students have poor knowledge, attitudes and practices towards EC.

3.0: STUDY OBJECTIVES

3.1: Broad objective

To determine knowledge, attitudes and practices relating to emergency contraception among health-care providers and medical students in Dar es Salaam.

3.2: Specific objectives

1. To determine the proportion of health care providers who know about EC in Dar es Salaam

2. To assess attitudes towards and practices of health care providers on EC provision in Dar es Salaam

3. To determine the proportion of medical students who know about EC in Dar es Salaam.

4. To assess attitudes towards and practices of EC utilization among medical students in Dar es Salaam.

4.0: METHODOLOGY

4.1: Study setting

The study was conducted in Dar es Salaam, the largest city in Tanzania. According to the 2002 population census, it has a population of 2,497,940 of which 1,236,864 (45.9%) are females. It has three municipalities namely Ilala, Temeke and Kinondoni. The inhabitants receive health services from public, private for profit and voluntary agency facilities. In each district, there is one public district hospital and at least two health centers. It has been chosen because of having health care providers of different cadres and also it hosts three medical universities Muhimbili University of Health and Allied Sciences (MUHAS), International Medical and Technological University (IMTU) and Hubert Kairuki Memorial University (HKMU). MUHAS is government owned while IMTU and HKMU are private owned. MUHAS has enrolled 949 medical students for the year 2009/2010 while HKMU has 377 medical students and IMTU 730 students.

4.2: Study design

The study was a descriptive cross-sectional study.

4.3: Study population

The study population included health care providers from both public and private health facilities in Dar es Salaam dealing with reproductive health services i.e. those working in the departments of Obstetrics and gynecology and RCH clinics. The health care providers who were included in the study were Nurses, nurse midwives, clinical officers, assistant medical officers, medical officers and Obstetrician/gynecologists. Medical officers included Residents, Registrars and intern doctors. Medical students from three medical universities- MUHAS, IMTU and HKMU from first to fifth year were also included.

4.4: Sample size calculation

1) Number of health care providers and medical students

Using the knowledge, attitude and practice of the health providers and medical students on EC as the key variables, the sample size was calculated by using the following formula;

$$N=\frac{Z^2P\,(100-P)}{e^2}$$

Where;

N- Minimal sample size

Z- Standard normal deviate value (corresponding to 95% interval)

e- Marginal error is set at 6% in this study

P- Because the study variables are multiple i.e. knowledge, attitude and practices, the P was taken to be 50%. Therefore the sample size was;

$$N=\frac{1.96x1.96x50\,(100-50)}{6\times 6}$$

N=267

The minimum calculated sample size for each group was **267** participants.

2) Number of health facilities

From Kielman recommendations on studies based on health facilities, a sample has to include 25 to 30% of all health facilities. [29] A total number of health facilities in Dar Es Salaam as per Chief Medical Officer was 41 in which 30% of them (i.e. 12 health facilities) were selected (See appendix I).

4.5: Sampling procedure

1) Selection of health facilities

A list of all health facilities in Dar es Salaam was obtained from the Chief Medical Officer from the Ministry of Health and Social Welfare (See appendix I). By using this list an equal number of public and private health facilities were selected in addition to Muhimbili National Hospital. District hospitals from each municipality were included as they were the only public hospitals in each Municipality, one public health center, one private hospital and one private health center from each district were included in the study. The public health centers were randomly selected by tossing a coin for the two health centers in a particular district. The list of the existing private health facilities by the district and the facility level was used to select the private facilities by using simple ballot method by writing the name of each facility and put them together in a box where a research assistant picked one paper for the facility to be included in the study. A total of six public and six private facilities and one tertiary Hospital (Muhimbili) were included in the study.

2) Selection of health care providers

From each selected facility, a convenience sampling method was used to select the study participants. All the eligible health care providers working in the reproductive health services who were available on the day of data collection were requested to participate in the study and those who gave their consent were involved in the study.

3) Selection of the medical students

From each university, a list of all medical students was obtained from the Registrar of a particular university. By using computer generated random numbers participants from each university were selected randomly.

4.6: Study variables

The dependent variables of the study were health care providers' and medical students' knowledge, attitude and practices towards emergency contraception. The independent variables were the health care providers' cadre and socio-demographic characteristics, level and ownership of the health facility. For medical students' were the socio-demographic characteristics, sexual history and history of contraception use.

4.7: Data collection tool

Self administered questionnaire was used to collect data. There were different questionnaires for health care providers and medical students. The questionnaire included both open and close ended questions. Demographic questions about the health care providers and medical students, level of knowledge about EC, practice and attitudes towards EC and from where information on EC was obtained were asked. Knowledge was measured by asking open and close ended questions while attitudes were assessed by providing statements and the respondents were asked to indicate the extent to which they agree with those statements on a predetermined scale (strongly disagree, disagree, don't know, agree and strongly agree). Questions for assessing practice were open and close ended. Both questionnaires were formulated in English and translated into Kiswahili. Both versions were available for use during data collection depending on the respondent comfortability with either language.

There were 3 research assistants each recruited from a particular university to distribute and collect the questionnaires from the medical students, questionnaires to health care providers were distributed and collected by the principal investigator. The research assistants were

trained for two days on the study. The training included brief explanation of the study objectives, how to introduce the study subject and to distribute the questionnaires as well as follow up of the questionnaires.

4.8: Pre-testing of the questionnaire

Pre-testing of the questionnaire was done two weeks before the study by the principal investigator and the research assistants. It was done at MUHAS and at Muhimbili National Hospital. It was aimed at checking how the target population will understand the data collection tool. Review of the questionnaire was done following the pre-testing and necessary modifications were made.

4.9: Data collection

Data collection was done from 22nd October to 20th November 2009. Questionnaires were self administered due to the sensitive nature of the subject. Names of the respondents were not indicated to assure confidentiality.

For health facilities, introduction of the study was done and questionnaires were distributed to those who had consented to participate. Collection of the questionnaires was arranged with the individual participant within the next 24 to 48 hours. For medical students, the study was conducted during break times and few minutes before beginning of classes therefore collection of filled questionnaires was possible within the same day.

4.10: Data processing and analysis

The open ended questions were coded by the principal investigator. Data was entered and cleaned using Epi Info version 6 computer program and then transferred to SPSS where analysis was done. The specific knowledge questions were: types of EC, mechanism of action of EC, effectiveness of EC, timing of the ECPs and IUCD, dosage of the ECPs and interval of taking ECPs. Respondents who responded correctly to above 60% of the specific questions

were taken to have adequate knowledge of EC, those who responded to 40% to 60% of the questions were taken to have moderate knowledge and those who responded to less than 40% were taken to have poor knowledge. [30] There was no respondent who did not respond to any of the questions. Knowledge was then analyzed by using Principle Component Analysis or Factor Analysis method of the SPSS program. The attitude questions were analyzed using the scoring system. Each attitude question had 5 scores (1- don't know; 2- strongly disagree; 3- disagree; 4- agree; 5- strongly agree), a total score was obtained for all attitude questions and the median was taken as the cut off point whereby the total score above the median was taken to be positive and below to be negative. Chi square test was used to test the association of various variables. P value of less than 0.05 was taken to be significant.

4.11: ETHICAL ISSUES

Ethical clearance was sought from the University Ethical Committee. Permission to conduct the study was sought from the District Medical Officer of each respective municipal hospital and public health center, health facility administration as well as from MUHAS, IMTU and HKMU Vice Chancellors. Each participant gave an informed consent by signing a special consent form before filling in the questionnaire. The questionnaire did not include the names. All the information obtained was confidential

.

5.0: RESULTS

There were 300 questionnaires for health care providers and 300 questionnaires for the medical students that were distributed. The response rate for health care providers was 89.3% and for medical students was 100%. Twenty questionnaires for the providers were returned unfilled because of lack of time for filling and 12 were not returned at all as some of the providers have misplaced them and others could not be contacted till the data collection period ended.

Description of the study population

A total of 268 health care providers from health facilities in the three municipalities of Dar es Salaam and the Muhimbili National Hospital (tertiary hospital) were included in the study. Among these, 62 (23.1%) were from Ilala, 65 (24.3%) from Kinondoni and 67 (25%) were from Temeke municipals respectively, while 74 (27.6%) were from Muhimbili National Hospital. See Appendix II. A total of 71.6% female and 28.4% male providers participated in the study. The age range of the Health care providers was 20 - 61 years. Out of 268 providers, 73.9% of them had a working experience of less than 10 years. Nurses formed the highest proportion of the study respondents (54.9%).

A total of 300 medical students from three medical universities in Dar es Salaam were also included. MUHAS contributed 150 participants while HKMU and IMTU contributed 75 participants each. The age range of the medical students was less than 19 years to 37 years. Most of those with an advanced age came from IMTU and HKMU and they were of Matured Entry System of university admission. Majority of them (77.3%) were in the age group 20-29 years, 56.3% were males while 73% of them were sexually active with only 34.3% of them using contraception. The commonest method of contraception used by most students was condom (60.9%). The ever pregnancy rate among the students was 24%.

Table 1: Awareness of EC among health care providers by selected characteristics

Characteristics	EVER HEARD OF EC				
	Yes (n=158)		No (n=110)		P value
	N	%	N	%	
Working Experience (In years)					
<10	126	79.7	72	65.4	**0.000**
10-20	21	13.3	18	16.4	
>20	11	7.0	20	18.2	
Age					
20-29	45	28.5	21	19.1	**0.003**
30-39	76	48.1	40	36.4	
≥40	37	23.4	49	44.5	
Sex (%)					
Male	61	38.6	15	13.6	**0.000**
Female	97	61.4	95	86.4	
Marital status (%)					
Single	51	32.3	20	18.2	**0.005**
Married/cohabiting	103	65.2	83	75.5	
*S/D/W	4	2.5	7	6.3	
Cadre (%)					
Nurses	62	39.2	85	77.3	**0.000**
CO	9	5.7	8	7.3	
AMO	13	8.2	5	4.5	
MO	53	33.5	11	10.0	
OBGY	21	13.4	1	0.9	

***S/D/W for separated, divorced and widowed**

Table 1 shows a proportion of health care providers who were aware of EC. Overall, 158 of 268 health care providers (i.e. 59%) were aware of EC. Those with a working experience of less than 10 years, age group 30-39 years, being a female and married or cohabiting were more likely to be aware of EC (p values 0.00, 0.003, 0.000 and 0.005 respectively). More nurses (77.3%) were not aware of EC while only slightly less than 1% of the Obstetricians/gynecologists were unaware of EC (P value 0.000).

Table 2: Awareness of EC among medical students by selected characteristics N=300

Characteristics	Awareness of EC				Total	P value
	YES (161)		NO (139)			
	N	%	N	%		
Age (in years)						
≤19	2	1.2	6	4.3	8	**0.000**
20-29	112	69.6	120	86.3	232	
≥30	47	29.2	13	9.4	60	
Sex						
Male	94	58.4	75	54.0	169	0.590
Female	67	41.6	64	46.0	131	
Marital status						
Single	112	69.6	124	89.2	236	**0.000**
Married	49	30.4	15	10.8	64	
Year of study						
Preclinical years	48	29.8	124	89.2	172	**0.000**
Clinical years	113	70.2	15	10.8	128	
Sexually active						
Yes	136	84.5	83	59.7	219	**0.001**
No	25	15.5	56	40.3	81	
Previously pregnant/ Impregnated somebody						
Yes	53	32.9	19	13.7	72	**0.000**
No	108	67.1	120	86.3	228	
Using contraception						
Yes	74	46.0	29	20.9	103	**0.001**
No	87	54.0	110	79.1	197	

*Preclinical years for 1st, 2nd and 3rd year and Clinical years for 4th and 5th year.

Table 2 shows a proportion of medical students who are aware of EC. Overall, 161 out of 300 (53.7%) medical students were found to be aware of EC. Those in the age group 20-29 years, single, those who were in the clinical years and those who were sexually active were more likely to be aware of EC (69.6%, 69.6%, 70.2% and 84.5% respectively, P value less than 0.01). Awareness of EC was found to be significant among those without a previous history of pregnancy or a history of ever used contraception (67.0% and 54.0% respectively, P value less than 0.01).

The commonest source of information was found to be through lectures (37.4%). (Not shown in the table)

Table 3: Knowledge of EC among Health care providers who are aware of EC
N= 158

Health care Workers	Knowledge of EC						
	Adequate		Average		Poor		Total
	n	%	n	%	n	%	
Nurses	4	6.5	15	32.6	43	67.2	62
CO	5	10.4	3	6.5	1	1.6	9
AMO	7	14.6	3	6.5	3	4.7	13
MO	15	31.3	21	45.7	17	26.6	53
OBGY	17	35.4	4	8.7	0	0	21
Total	**48**	**30.4**	**46**	**29.1**	**64**	**40.5**	**158**

Adequate knowledge of EC was found among 30.4% of the health care providers. Except for the Obstetricians/gynecologists who are supposed to have maximum knowledge in reproductive health issues, the level of knowledge varied significantly between the cadres being lowest among the nurses (8.3%, P value 0.000).

Table 4: Medical students with knowledge of EC N=161

Characteristics	KNOWLEDGE OF EC						
	Adequate (n=53)		Average (n=49)		Poor (n=59)		P value
	N	%	N	%	N	%	
Age (in years)							
≤19	0	0	0	0	2	3.4	0.076
20-29	37	69.8	31	63.3	44	74.6	
≥30	16	30.2	18	36.7	13	22.0	
Year of study							
Preclinical Years	5	9.4	13	26.5	30	50.8	**0.000**
Clinical Years	48	90.6	36	73.5	29	49.2	
Sexually active							
Yes	47	88.7	43	87.8	46	78.0	0.220
No	6	11.3	6	12.2	13	22.0	
Previously pregnant							
Yes	21	39.6	16	32.7	16	27.1	0.370
No	32	60.4	33	67.3	43	72.9	
Contraceptives use							
Yes	27	50.9	24	49.0	23	39.0	0.390
No	26	49.1	25	51.0	36	61.0	

Table 4 shows proportions of medical students with knowledge of EC whereby 53 of 161 (32.9%) had adequate knowledge on the types, ingredients, effectiveness and timing of EC. Knowledge appeared to increase significantly among those in clinical years of study (90.6%, P value 0.000).

Table 5: EC provision to clients by health care providers N=158

Characteristics	EC Provision			
	YES (n=49)		NO (n=109)	
	N	%	N	%
Working Experience in (In Years)				
<10	37	75.5	89	81.7
10-20	7	14.3	14	12.8
>20	5	10.2	6	5.5
Age (in Years)				
20-29	9	18.4	36	33.0
30-39	27	55.1	49	45.0
≥40	13	26.5	24	22.0
Religion				
Muslims	12	24.5	28	25.7
R.C	18	36.7	46	42.2
Protestants	14	28.6	26	23.8
Others	5	10.2	9	8.3
Sex				
Male	25	51.0	36	33.0
Female	24	49.0	73	67.0
Cadre				
Nurses	11	22.4	51	46.8
CO	4	8.2	5	4.6
AMO	7	14.3	6	5.5
MO	12	24.5	41	37.6
OBGY	15	30.6	6	5.5

***Others for Hindu, Jehovah Witness**

Table 5 shows that 49 out of 158 providers (31%) have provided EC to clients. Those in the age group 30-39 years (55.1%) and male providers (51%) were more likely to provide EC. Obstetricians/gynecologists are expected to be the leading cadre in provision of EC; Clinical Officers formed the lowest proportion of the providers who have provided EC followed by the assistant medical officers (8.2% vs 14.3%)

Utilization of EC among medical students was found to be 14.9%. Among the providers of EC mentioned, pharmacy (without prescription) was the commonest source (70.8%) and the

commonest reason given for using EC by the medical students was unplanned sex (62.5%) (Not shown in the table).

Table 6: Providers' attitudes towards EC provision

Characteristics	Positive attitude (n=150) N	%	Negative attitude (n=8) N	%	Total	P value
Age (in years)						
20-29	44	29.3	1	12.5	45	**0.001**
30-39	73	48.7	3	37.5	76	
≥40	33	22.0	4	50.0	37	
Working Experience (in years)						
<10	123	82.0	3	37.5	126	**0.000**
10-20	16	10.7	5	62.5	21	
>20	11	7.3	0	0	11	
Religion						
Muslims	38	25.3	2	25.0	40	0.293
R.C	61	40.7	3	37.5	64	
Protestants	38	25.3	2	25.0	40	
Others	13	8.7	1	12.5	14	
Cadre						
Nurses	54	36.0	8	100	62	0.210
CO	9	6.0	0	0	9	
AMO	13	8.7	0	0	13	
MO	53	35.3	0	0	53	
OBGY	21	14.0	0	0	21	
Ever provided EC						
Yes	48	32.0	1	12.5	49	0.104
No	102	68.0	7	87.5	109	

***Others for Hindu, Jehovah Witness**

Out of 158 providers who were aware of EC, 150 (i.e. 94.9%) were found to have positive attitudes towards EC. Those in the age group 30-39 years (48.7%, P value 0.001) and those with a working experience of less than 10 years (82.0%, P value 0.00) were more likely to have positive attitude towards EC. None of those with a working experience of more than 20 years had negative attitude towards EC. (0%, P value 0.000)

Table 7: Attitudes of medical students towards EC

Characteristics	ATTITUDES TOWARDS EC USE				TOTAL	P value
	Positive attitude (n=146)		Negative attitude (n=15)			
	N	%	N	%		
Age (%)						
< 19 years	2	1.4	0	0	2	0.856
20-29 years	103	70.5	9	60.0	112	
≥30 years	41	28.1	6	40.0	47	
Year of study						
Preclinical years	40	27.4	8	53.3	48	0.436
Clinical years	106	72.6	7	46.7	113	
Sexually active						
Yes	124	84.9	12	80.0	136	0.531
No	22	15.1	3	20.0	25	
Previously pregnant						
Yes	46	31.5	7	46.7	53	0.160
No	100	68.5	8	53.3	108	
Contraceptives use						
Yes	69	47.3	5	33.3	74	0.408
No	77	52.7	10	66.7	87	
Ever used EC						
Yes	24	16.4	0	0	24	0.100
No	122	83.6	15	100	137	

And Out of 161 medical students who were aware of EC, 146 (i.e. 90.7%) had positive attitudes towards EC. However neither age, year of study, being sexually active, contraceptive

use, history of previous pregnancy nor EC use appeared to influence attitude positively (P value > 0.05).

6.0: DISCUSSION

6.1: Knowledge of EC among health care providers

This study has revealed that 59% of the health care providers were aware of EC. These are the ones who are supposed to provide this service to those who need it; therefore the level of awareness of EC among health care providers found in this study is low which also reflects the underutilization of this method. The level of awareness was found to be higher among those with a working experience of less than 10 years (79.7%, P value 0.00). This composed a group of the young practitioners who admitted to have received information regarding EC during their professional trainings compared to those with a longer working experience who most of them denied to receive this information during their trainings. Likewise those in the age group 30-39 years, females and married or cohabiting providers were more likely to be aware of EC compared to their counterparts (48.1%, 61.4% and 65.2%, P value 0.003, 0.00 and 0.005 respectively). Except for the Obstetricians/gynecologists who are the pioneers of reproductive health, awareness of EC varied significantly between the cadres as majority of the nurses (77.3%) were found to be unaware of EC compared to other cadres (P value 0.00). In our setup, the nurses are the ones who mainly deals with provision of family planning services which includes EC, this implicates the lack of information of EC among the women who uses contraception as EC serves as a back up method in case of a contraception failure. However, the rate of awareness found in this study is low compared to other studies. [1, 15, 16, 17, 18, 19, 20]

Only 30.4% of the health care providers were found to have adequate knowledge of EC types, mechanism of action of ECs, dosage of ECPs, appropriate timing, interval of taking ECPs and effectiveness of EC. The level of knowledge differed by occupation, with a higher proportion of physicians (Medical Officers and Obstetricians & Gynecologists) having good knowledge of EC. This is expected as Obstetricians/gynecologists are supposed to have maximum knowledge regarding EC. The level was lowest among the nurses (8.3%, P value 0.000). Most providers reported that they had received knowledge of EC during their professional trainings,

but once someone is not working under the family planning clinic, slowly his/her knowledge regarding EC wears off. This was mostly reported by nurses.

From the results it is obvious that there is profound lack of knowledge regarding EC. This lack of knowledge is more pronounced among the nurses who are the ones who usually provide family planning services including EC. Assistant medical officers (AMO) were also found to have low level of knowledge regarding EC. In our set up, most of the primary health facilities which also provides EC are managed by the assistant medical officers, therefore their low level of knowledge of EC can impose a barrier on implementing policy on EC in these facilities. Overall, this low level of knowledge about EC among providers could be a barrier towards EC provision as it will be difficult for a provider to provide a service which he or she is not knowledgeable. It calls for an effort to make sure that providers are provided with necessary information about EC to make it an effective way of preventing unintended pregnancies. Several studies which have been done elsewhere have also indicated a lack of knowledge of EC among health care providers. [14, 15, 16, 17, 18, 19, 21, 22] In Nigeria, the level of knowledge about EC was low and was not influenced by either years of experience or type of facility where respondents worked. A higher proportion of physicians were having good knowledge of EC.[20]

Knowledge of EC among medical students

Out of 300 medical students, 161 (53.7%) of them were aware of EC. As this sample included the medical students whose part of their training includes EC, this level of awareness is low. Several studies have also indicated a low level of awareness of EC and other studies even a lower level compared to this study. [2, 5, 6, 24, 25, 27, 28] However the level of awareness reported in this study is low compared to the one found in USA and by Ikeme et al in Nigeria. [23, 26]Such difference in the awareness levels in different countries may be due to cultural differences and government policies that EC may have been advocated for quite some time in those countries to an extent that most people and especially the youth are aware of the method. Awareness varied between different age groups being low among the under 19 years of age (1.2%, P

value 0.00), this reflects the low level of awareness of EC among the adolescents who are at an increased risk of unintended pregnancy because the nature of their sexual relationships is that of having no steady relationships and they also have difficulties in negotiating safe sex. Awareness was also found to be high among those in the clinical years of training i.e. those in the 4th to 5th years (70.2%, P value 0.00). This is so because during this period of training, medical students are exposed to the clinical rotations with the aim of making them acquire medical knowledge and skills.

Being sexually active has been shown to influence awareness in this study as 84.5% of those who were sexually active were aware of EC (P value 0.001). Likewise, in the studies by Aziken et al and Ebuehi et al [5, 25] though in this study the history of contraceptive use was not found to influence awareness. It is likely that those who are sexually active may have recognized themselves as having a risk of acquiring unintended pregnancy which gave them an opportunity to learn about EC.

Among the medical students, adequate specific knowledge about EC was found in only 32.9% of them. Majority of the students in the clinical years had adequate knowledge of EC (90.6%, P value 0.00). Kebede et al also found the level of knowledge to increase with age and year of study. [27]

Those who were sexually active, with previous history of pregnancy or having impregnated a woman and those with a history of contraception use were not more likely to have adequate knowledge of EC compared to their counterparts. This is in contrast to the findings by Ebuehi et al, Aziken et al, and Ikeme et al where knowledge EC was significant among those who were sexually active and with history of contraceptive use. [5, 25, 26]

As medical students would be expected to have greater knowledge of emergency contraception than less educated youths, our findings reflects a serious lack of knowledge among the non medical students and the young population in general. This can pose as an obstacle towards EC utilization as once knowledge is not adequate, misconceptions tends to prevail which can hinder utilization of a service. Cynthia et al found that most students in USA lacked knowledge of EC which contributed to health and ethical misgivings about the regimen. [23]

Other studies have also indicated a lack of specific knowledge of EC among college and or university students. [2, 5, 6, 23, 24, 25, 26, 27, 28]

Source of information of EC among medical students

The commonest source of information about EC was through lectures 37.4%. This is in contrast to other studies where friends were mentioned as the major source of information. [2, 5, 25]In other studies friends and teachers were the major source of information. [26] This can be explained by the fact that the participants in this study were medical students who receives information regarding EC as a part of their course, that's why the source of information was found to be through lectures.

EC provision by health care providers

Among the health care providers who were aware of EC, only 31% have provided EC to clients. The commonest indication for prescribing EC was unplanned sexual intercourse (39.3%). As expected, Obstetricians/gynecologists were more likely to provide EC to clients compared to other providers. Those in the age group 30-39 years (55.1%, P value 0.000) and male providers (51%%, P value 0.03) were more likely to provide EC. Despite the fact that rape is rampart in our setting with its consequent unplanned pregnancies which mostly ends up as unwanted and hence unsafe abortions, still the rate of provision of EC by our health care providers is very low. At one of the municipal hospitals, the nurse who was responsible for family planning services informed that she has knowledge about EC, but she was not providing it as women were not seeking this important service. The reason could be because the women are not informed and hence are not aware of it. Studies done elsewhere have indicated a relatively higher rate of provision compared to the results found by this study. [1, 15, 20, 21] However an even higher provision rate was found by studies done in the developed countries probably due to cultural differences and government policies. [18, 19]This calls for a need for the providers to improve EC provision to clients in order to have a positive impact on reduction of unsafe abortions and their consequences.

EC utilization by the medical students

Utilization rate of EC among the medical students was found to be very low as only 14.9% of the medical students reported to have ever used EC. Taking into consideration that majority of the students (73%) were sexually active with only 34.3% of them using contraception and the ever pregnancy rate among the students being 24%, this low EC utilization rate reflects the magnitude of unwanted pregnancies which have a potential of ending up with unsafe abortions.

The low utilization rate can be reflected by the lack of awareness of this method or not knowing where to obtain the method probably because EC methods were not well publicized to be available in Tanzania previously. Likewise, several studies have also indicated a low utilization rate of EC. [2, 5, 24, 25, 26, 27, 28] Among the providers of EC mentioned, pharmacy (without prescription) was the commonest source (70.8%) and the commonest reason given for using EC by the medical students was unplanned sex without using contraception (62.5%). In order to improve this we need an advocacy for this important way of preventing unwanted pregnancies. Pharmacists have to be provided with necessary information of EC to enable them to provide this service to those who are in need of this service. Pharmacy as the possible source of EC has also been mentioned in other studies. [2, 21] In Tanzania, family planning clinics were mentioned as the possible source of EC. [28]

Health care providers' attitudes towards EC

Overall, most providers (i.e. 94.9%) were found to have positive attitude towards EC provision. Those in the age group 30-39 years (48.7%, P value 0.001) and those with a working experience of less than 10 years (82.0%, P value 0.00) were more likely to have positive attitude towards EC. However none of those with a working experience of more than 20 years had negative attitude towards EC. (0%, P value 0.000). This favorable attitude will have a positive impact on improvement of provision of EC to clients. However, some providers were having misconceptions about EC whereby they equated emergency

contraception to abortion. Providers who have prescribed emergency contraception were more likely than others to have positive attitudes towards EC, however this finding was not significant (98%, P value 0.104). In contrast to the study done in USA 2008, where positive attitude was found more in those who prescribed EC. [15] Other studies have also indicated that majority of the providers had positive attitudes towards EC. [1, 18]while in the Carribean only twenty five percent of the providers had a positive attitude on the over the counter availability of EC. [19]

Medical students' attitudes towards EC use

Majority of the Medical students i.e. 146 students (90.7%) had positive attitudes towards EC. However neither age, year of study, being sexually active, being using contraceptives, history of previous pregnancy or EC use appeared to influence attitude positively (P values > 0.05). In USA, many students approved EC use and having adequate knowledge of EC has been associated with positive attitudes. [23] In Nigeria, majority of the students had negative attitudes towards EC use. [26] Muia et al carried out a focus group discussion among university students in Nairobi about EC and found that many students were concerned with the appropriateness of its use and side effects; they considered EC as an abortifacient. Furthermore they thought that EC will lead to an increase in STDs and decrease in the use of regular contraceptives. Majority of them believed that the very young should not be given EC. [21] Byamugisha et al found that attitude towards over the counter (OTC) availability of EC among university students was negative for most of the students. Reasons for this were fear of misuse, risk of complications, increase in risky behaviour/moral decay and fear of side effects.[2]Favorable attitudes on EC have a very strong bearing in improving utilization of EC as those with positive attitudes are more likely to utilize this service compared to those with negative attitude.

Emergency contraception is a method for emergency use, not for regular use, and should be available to women who have had forced intercourse (rape), women who have had unexpected intercourse without contraceptive protection, or have a contraceptive failure such as condom breakage. EC methods provide women with a second chance at prevention. More efforts have

to be done to make it more available, increase provision as well as utilization in order to reduce morbidities and mortality resulting from unsafe abortions.

7.0: Study limitations

The sample of the study subjects (health care providers) may be unrepresentative of the study population due to convenience sampling method which was used to select the health care providers.

This study was based only on university students pursuing medical degree. Hence our study may not be truly representative of university students pursuing other degrees.

The use of the self administered questionnaires could have lead to bias in the results as it gives a room for false responses.

Due to the tight working schedules, some providers were reluctant to fill the questionnaires which resulted into several follow up visits for questionnaire collection and return of some unfilled questionnaires and even some of them not to be returned for the required time till the data collection period ended.

The time that was allocated for data collection was not enough as it was not possible to collect the filled questionnaires for the health care providers on the same time/day.

8.0: Conclusion

The awareness of emergency contraception among the health care providers and medical students was found to be moderate (59% vs 53.7%). However adequate knowledge on emergency contraception on both groups was low (30.4% vs 32.9%). Provision of EC by the health care providers as well as utilization of EC among medical students was found to be low. Majority of the providers had positive attitudes towards EC provision while students had positive attitudes towards EC utilization.

9.0: Recommendations

Continuing education programmes about Emergency contraception are required for health care providers to update them with the information regarding EC.

There is a need for policy makers to involve the mass media to advocate for emergency contraception to the society especially to the ones who are at risk of unintended pregnancies.

There is a need to provide information about EC together with the reproductive health education in schools to include the young population who are at a high risk of unintended pregnancy.

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Appendix I: List of Health Facilities level, ownership and location in Dar es Salaam

	Name of health facility	Level of health facility	Public or Private	District
1	Agha Khan	Hospital	Private	Ilala
2	Amana	Hospital	Public	Ilala
3	Buguruni	Health Center	Public	Ilala
4	Buguruni Anglican	Hospital	Private	Ilala
5	Dr. Hameer	Health Center	Private	Ilala
6	Dr. K.K. Khan	Hospital	Private	Ilala
7	Hindu Mandal	Hospital	Private	Ilala
8	Ibrahim Haji	Hospital	Private	Ilala
9	Mnaz Mmoja	Health Center	Public	Ilala
10	Natural Therapy	Health Center	Private	Ilala
11	Muhimbili	Hospital	Public	Ilala
12	Regency	Hospital	Private	Ilala
13	St. Bernard	Hospital	Private	Ilala
14	Sunni	Hospital	Private	Ilala
15	TOHS (Dar Group)	Health Center	Private	Ilala
16	TTCL	Health Center	Private	Ilala
17	TMC Buguruni	Health Center	Private	Ilala
18	Tumaini	Hospital	Private	Ilala
19	Arafa Upendo	Health Center	Private	Temeke
20	Bandari	Health Center	Private	Temeke
21	Hakika	Health Center	Private	Temeke
22	Kigamboni	Health Center	Public	Temeke
23	Navy TPDF	Health Center	Private	Temeke
24	Temeke	Hospital	Public	Temeke
25	Vijibweni	Health Center	Public	Temeke
26	Walter	Hospital	Private	Temeke
27	CCBRT	Hospital	Private	Kinondoni
28	University of DSM	Health Center	Private	Kinondoni
29	Jangwani	Health Center	Private	Kinondoni
30	Lugalo	Hospital	Public	Kinondoni
31	Magomeni	Health Center	Public	Kinondoni
32	Massana	Health Center	Private	Kinondoni
33	Mikocheni	Hospital	Private	Kinondoni
34	Mikumi	Hospital	Private	Kinondoni
35	Mount Ukombozi	Hospital	Private	Kinondoni
36	Mwananyamala	Hospital	Public	Kinondoni
37	Oysterbay	Hospital	Private	Kinondoni
38	Sinza	Health Center	Public	Kinondoni
39	St. Raphael	Hospital	Private	Kinondoni
40	TMJ	Hospital	Private	Kinondoni
41	Massana	Hospital	Private	Kinondoni