

# Knowledge and Utilisation of Emergency Contraception Pills among Female Undergraduate Students at the University of Nairobi, Kenya

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## Abstract

**Background:** Emergency Contraception (EC) is used after unprotected sexual intercourse, following sexual abuse, misuse of regular contraception or non-use of contraception. Seventeen percent of pregnancies in Kenya are unintended, potentially leading to unsafe abortion that contributes to the high maternal mortality rate in Country. According to 2016 Kenya Demographic and Health Survey (KDHS), the maternal mortality ratio was 362 maternal deaths per 100,000 live births. Female students in University or College are vulnerable to unplanned pregnancies and illegal abortions resulting in mortality, morbidity and psychosocial problems. Knowledge on EC is very important for students as they are not in stable relationships and not using regular contraception. Therefore, the aim of this study was to determine the knowledge and use of Emergency Contraception among female undergraduate students in the University of Nairobi. **Materials and Methods:** We used an institution-based cross sectional, quantitative study among 383 female undergraduate students at the University of Nairobi. The University of Nairobi has six colleges and systematic random sampling was used to select study participants from each college. Data were collected using self-administered questionnaires and analysed using SPSS Version 16. Bivariate analysis and logistic regression were used to determine sample characteristics significantly associated with knowledge and utilisation of Emergency Contraception. **Results:** Most (53%)

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of the respondents were sexually active, and only 20% of the sexually active female students had ever used Emergency Contraception. Emergency Contraception awareness was high at 86.4%. However, based on a predefined criterion, accurate knowledge of Emergency Contraception was low at 42.6%. The majority (82.5%) of the respondents depended on mass media as a source of information on Emergency Contraception. Factors associated with Emergency Contraception knowledge on bivariate analysis were: age 20 years and above ( $p = 0.001$ ), enrolment in college of health science ( $p = 0.001$ ), being in year three of study and above ( $p = 0.0001$ ) and having an insurance cover ( $p = 0.021$ ). Ever use of Emergency Contraception was associated with enrolment in the College of health science ( $p = 0.025$ ) and age 20 years and above ( $p = 0.050$ ). In multivariate analysis, older age (Aor 1.885  $p = 0.003$ ) as well as being in the College of health science (Aor  $< 0.001$ ) were significantly associated with increased probability of being knowledgeable about Emergency Contraception. **Conclusion:** Although University of Nairobi female undergraduate students are aware of the existence of Emergency Contraception, their specific knowledge on correct timing of taking EC after unprotected sex and on effectiveness is poor. EC use is also low, compounded by underutilisation of public facilities as a source of the EC and underutilisation of health workers as a source of EC information. Therefore, an educative forum may be needed to improve the knowledge of EC among University of Nairobi female students. Health education on the availability of EC in public facilities needs to be addressed. Possible use of informal sources of information such as peer education could be an area to explore in client education on EC knowledge and use. Further research is recommended to establish factors that influence utilisation of public health workers as a source of EC information.

### Keywords

Emergency Contraception, Knowledge, Utilisation

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## 1. Introduction

Emergency contraception is a method of preventing unwanted pregnancy after unprotected sex or misuse of regular contraception. It is estimated that of the 210 million pregnancies that occur each year [1] some 80 million are unintended. Unwanted pregnancies are usually correlated with increased danger of unsafe abortions, maternal morbidity and mortality [2]. In 2008, 21.6 million unsafe abortions were estimated to have occurred, causing the deaths of 47,000 women [3]. During 2010-2014, an estimated 8.3 million induced abortions occurred each year in Africa [4] of which 36,000 mothers die from abortion related complications while millions experience short- or long-term disabilities [5]. Approximately 464,000 induced abortions occurred in Kenya in 2012. It was also reported that approximately 49% of all pregnancies in Kenya were unintended

and 41% of the unintended pregnancies ended in an abortion [6].

Contraceptive use has been identified as a paramount intervention to minimize the unwanted pregnancies and its related adverse consequences [7]. Evidently, use of family planning methods would possibly prevent 90% of abortions, a fifth of pregnancy-related morbidity and a third of maternal mortalities worldwide [8]. The population policy in Kenya promotes family planning as an entitlement that is based on informed and voluntary choice [9]. Various family planning methods have been used to meet the dire need for control of the high population growth over the years as advocated by the government and other stake holders [10]. Emergency contraception reduces the high rate of population growth and prevents maternal morbidity and mortality by reducing unwanted pregnancy and helps reduce school dropout among students. This research therefore, aimed at establishing emergency contraceptive knowledge and utilisation in particular among the female university students who are part of the reproductive age group.

## 2. Methods

### 2.1. Study Setting

The University of Nairobi is one of 30 government chartered Universities in Kenya. The University has six colleges in Nairobi and its environs. The College of Health Sciences located the Kenyatta National Hospital, College of Agriculture and Veterinary Sciences at Upper Kabete campus, College of Biological and Physical Sciences at Chiromo campus, College of Education and External Studies at Kikuyu campus, College of Architecture and Engineering at the Main campus, College of Humanities and Social Sciences also located at the main campus. During the study period in 2014, the total University student population was 51,115 out of this number 20,431 were females.

### 2.2. Study Design and Participants

This was a descriptive cross-sectional study involving randomly selected female students ( $N = 383$ ) from the six (6) Colleges of the University of Nairobi. During the study period, the University had 20,431 female students. Fischer's formula was used to determine the sample size (Fitchers *et al.*, 1998;  $n = \frac{z^2 pq}{d^2}$ ) and considered 95% CI, 47% proportion of the level of knowledge of EC from a study done in Kenya in 2012 [10] within a degree of precision of 0.05, this resulted to a sample size of 383.

### 2.3. Sampling Technique

Based on the number (20,431) of female students from the six colleges of the University of Nairobi, proportions for each college were calculated. Systematic random sampling was used to select the 383 study subjects.

Number of students sampled per college based on female student population in 2014.

College	Male	Female	Sample size	%	Total
Health Sciences	1884	1974	37	9.7	3802
Human & Social Sciences	14,649	10,616	199	52.0	26,409
Agriculture & Veterinary Services	1494	1067	20	5.2	2174
Architecture & Engineering	3769	1387	26	6.8	4876
Biological & Physical Sciences	2916	1600	30	7.8	4087
Education & External Studies	5972	3787	71	18.5	9598
Total	30,684	20,431	383	100	51,115

## 2.4. Data Collection

A pre-tested self-administered questionnaire was used to collect data on demographic, knowledge and practice of emergency contraceptives. The questionnaires were pre-tested among 15 students at Moi University. The results of the pretesting were analysed and used to review the tool.

## 2.5. Data Analysis

Data was analysed using SPSS version 16 and several forms of analysis were applied to include descriptive statistics; Chi Square for bivariate analysis was used to establish the association of various variables and thereafter the significant variables were reassessed in the multiple logistic regression to identify the significant variables after controlling other variables influencing knowledge and utilisation of emergency contraception. A knowledge index was constructed based on a set of twelve questions. For each question a respondent answered correctly, a score of one was awarded, or else none. The total score for each respondent was computed and converted into the corresponding percentage (scored out of 100). The knowledge level of the respondents was dichotomized. Those who scored less than 70% were classified as having “low” level of knowledge on EC while those who score 70% or more were categorized as having “high” level of knowledge on EC. The statistical significance was set at  $p\text{-value} \leq 0.05$ .

## 2.6. Ethical Considerations

Ethical approval to conduct the study was obtained from the Institutional Research and Ethics committee of Moi University (Approval number. 0001172). A research permit was obtained from the National Commission of Science and Technology. Permission was also granted by Nairobi county commissioner and by the administration of University of Nairobi. The study subjects gave a signed informed consent before engaging in the research.

## 3. Results

### 3.1. Socio Demographic Characteristics of the Respondents

A total of three hundred and eighty three (383) female students from the Uni-

iversity of Nairobi participated in the study with mean age of 21 years. Majority, (90.9%), of the respondents were single, 2.6% married and 6.5% of cohabiting. Majority (97.6%), were Christians with proportion of Catholics and Protestants being 22.7% and 74.9% respectively. Muslims constituted a minority at 2.3% (**Table 1**).

**Table 2** below shows campus related characteristics of the respondents. Almost an equal proportion of government sponsored and private sponsored students took part in the study, 51.4% and 48.6% respectively. Inquiries on the places of residence revealed that some of the students were living with parents (6.3%) and relatives (7.8%). Most of them resided in the campus hostels (76.5%) while 4.2% had rented hostels outside the campuses (where they were either living individually (4.2%) or sharing with a friend (5.2%)). Regarding to their level of study, the highest proportion were first year at 36.6% followed by second and third year of study at 27.4% and 18.0% respectively. In terms of Colleges, College of Human & Social Sciences contributed the highest proportion of study participants (52.0%). Students from College of Education & External Studies and College of Health Sciences comprised 18.5% and 9.7% respectively. Overall, 42.0% of the students had an insurance cover. Most of these insurance covers (60.2%) were by the state-owned health insurance cover provider (NHIF). The rests were under various private health insurance cover providers.

### 3.2. Knowledge on Emergency Contraceptive

**Table 3** below outlines knowledge of EC amongst the female students. When asked whether they had ever heard of (EC), majority of the study participants responded in the affirmative 331 (86.4%). Most of the students (86.7%), mentioned

**Table 1.** Social demographic characteristics of the participants (N = 383).

Characteristic	Frequency (n = 383)	Percentage (%)
<b>Age (years)</b>		
18 - 19	76	19.8
20 - 21	187	48.8
22	80	20.9
>22	40	10.4
<b>Marital status</b>		
Married	10	2.6
Single	348	90.9
Cohabiting	25	6.5
<b>Religion</b>		
Catholic	87	22.7
Protestant	287	74.9
Muslims	9	2.3

**Table 2.** Background characteristics of the respondents (N = 383).

	Frequency (n = 383)	Percent (%)
<b>Module</b>		
Government sponsored	197	51.4
Private sponsored	186	48.6
<b>College</b>		
Health Sciences	37	9.7
Human & Social Sciences	199	52.0
Agriculture & Veterinary services	20	5.2
Architecture & Engineering	26	6.8
Biological & Physical Sciences	30	7.8
Education & External Studies	71	18.5
<b>Accommodation/Residence</b>		
Resides with parents	24	6.3
Resides with relatives	30	7.8
Resides in campus	293	76.5
Rental house (individual)	16	4.2
Rental house (shared)	20	5.2
<b>Year of study</b>		
First	140	36.6
Second	105	27.4
Third	69	18.0
Fourth	57	14.9
Fifth	12	3.1
<b>Having insurance cover</b>		
Yes	161	42.0
No	222	58.0

emergency contraception pills as an EC method. Almost all of the respondents (98.8%) recognized that EC does not offer protection against Sexually Transmitted Infections (STIs) and Human Immunodeficiency Virus (HIV) infection. About a third, 113 (34.1%), could correctly identify 120 hours as the upper limit hours for use of EC after coitus.

Regarding appropriate time for taking EC, majority, 307 (92.7%), reported that it should be taken after engaging in sexual intercourse. About a quarter, 92 (27.8%) of the respondents identified that EC can give up to 95% protection if taken appropriately. A substantial proportion of the students (59.5%) believed taking EC gave 100% protection against unwanted pregnancies. Most of the respondents (98.8%), reported that EC was not supposed to be used as a regular method of contraception. In addition, 21.5% of them attested that EC should be

**Table 3.** Knowledge on emergency contraception (N = 383).

Variable	Frequency	Percent (%)
<b>Ever heard of EC (n = 383)</b>		
Yes	331	86.4
No	52	13.6
<b>Methods reported as EC (n = 331)</b>		
Pills	287	86.7
IUD	35	10.6
Others (Incorrect methods)	9	2.7
<b>Can the EC protect against STIs &amp; HIV infection?</b>		
No	327	98.8
Yes	4	1.2
<b>Maximum time post-coitus within which EC should be taken (hours)</b>		
24	26	7.9
12	13	3.9
48	31	9.4
72	143	43.2
120	113	34.1
Don't know/Not sure	5	1.5
<b>When should EP be taken?</b>		
After an act of sexual intercourse	307	92.7
Before sexual intercourse	9	2.7
Either before or after	5	1.5
Don't know/Not sure	10	3.1
<b>Is it ok to use EP as a regular FP method?</b>		
No	327	98.8
Yes	4	1.2
<b>Indications</b>		
Spillage of semen	313	94.6
Condom breakage	310	93.7
Missed regular FP pills	126	38.1
Unprotected sex	320	96.7
<b>Efficacy of E-pills</b>		
100%	197	59.5
95%	92	27.8
50%	12	3.6
<50%	5	1.5
Don't know/Not sure	10	3.0

**Continued****Safe interval for repeat of EC**

After a month	71	21.5
After a week	5	1.5
After one year	99	29.9
Others	15	4.5
No response	141	42.6

**Knowledge level**

High ( $\geq 70\%$ )	141	42.6
Low ( $< 70\%$ )	190	57.4

repeated after one month. A knowledge index was constructed based on a set of twelve questions. For each question a respondent answered correctly, a score of one was awarded, or else none. The total score for each respondent was computed and converted into the corresponding percentage (scored out of 100). All the respondents were found to possess some knowledge on EC with the marks ranging from 33% to 92%. The mean  $\pm$  standard deviation score was  $69.3 \pm 8.7$ . The knowledge level of the respondents was dichotomized. Those who scored less than 70% were classified as having “low” level of knowledge on EC while those who score 70% or more were categorized as having “high” level of knowledge on EC. Overall, 141 participants (42.6%) had high level of EC knowledge while 190 participants (57.4%) had low level of EC knowledge.

**3.3. Practice of Emergency Contraception (EC)**

Of the respondents, 203 (53.0%) reported they were sexually active, 41 (20.2%) had ever used EC. A probe on the last time of use of EC revealed that 26.8% had used EC within a period of three months preceding the time this study was undertaken. The principal reason cited for using EC among the students was having had unprotected sex (87.8%). Only three respondents claimed to stock Emergency contraceptive for future use.

**3.3.1. Respondents Sources of Information on Emergency Contraception (EC)**

**Table 4** outlines the sources of information regarding to EC. The respondents who had ever heard of EC revealed that mass media was the principal source of information (82.2%). Additionally, some respondents, (54.4%), mentioned their peers as the source of information on EC. Other major sources of information included lecturers (21.1%), books/magazines (9.1%), internet (8.5%) and health workers (7.3%) as shown in **Table 5**. Most of the respondents (97.3%) reported that they had found the said sources of information as either informative or very informative.

**3.3.2. Sources of Emergency Contraception**

The study respondents reported that the main sources of EC as private pharmacies



**Table 4.** Sources of information on Emergency Contraception (EC).

Characteristic	Frequency	Percent (%)
<b>Sources of information (n = 331)</b>		
Mass media	272	82.2
Friends	180	54.4
Lecturers	70	21.1
Books/Magazines	30	9.1
Internet	28	8.5
Health workers	24	7.3
Family	17	5.1
Sales agent	8	2.4
<b>Rating of how informative the source was? (n = 331)</b>		
Very informative	151	45.6
Informative	171	51.7
Not informative	9	2.7

**Table 5.** Sources of Emergency Contraception (EC).

Characteristic	Percent (%)
<b>Sources of EC</b>	
Doctor's clinic	27.2
Private hospitals	50.4
Public health facility	52.7
University clinic	53
Private pharmacies	74.4

at 74.4%, public health facilities at 52.7% and private hospitals at 50.4% and among others (**Table 5**).

### 3.4. Factors Associated with Emergency Contraception (EC) Level of Knowledge

In the bivariate analysis, respondents' age, College of study, year of study and insurance coverage were significantly associated with level of knowledge. Students aged above 20 years had significantly higher level of knowledge on EC as compared with their counterparts of 20 years or less (OR) = 2.297; 95% confidence interval (CI): 1.467 - 3.596,  $p = 0.001$ ). Moreover, students enrolled in the College of Health sciences had a 3.5-fold increased likelihood of having a higher level of knowledge as compared to those from other colleges in the university (OR = 3.508; 95% CI: 1.612 - 7.637,  $p = 0.001$ ). Students in the third year and higher level of study were rated as having a high level of knowledge of EC when evaluated against the respondents who were either in their first or second year of study

(54.2% versus 36.0%, respectively; OR = 2.099; 95% CI: 1.331 - 3.312,  $p = 0.001$ ). A student who held an insurance cover had 1.7 increased odds of being classified in the high knowledge level category as compared to the one who did not have an insurance cover (OR = 1.700, 95% CI: 1.082 - 2.672,  $p = 0.021$ ). A student's place of residence, marital status and religion were not significantly associated with the level of knowledge on EC amongst the study participants (**Table 6**).

### 3.5. Factors Associated with Utilization of Emergency Contraceptives (EC)

The study also sought to determine the correlates of EC utilization in the female

**Table 6.** Bivariate analysis of EC knowledge by various attributes,  $n = 331$ .

Characteristic	Total	Knowledge level		OR	95% CI		P value
		Low (n = 190)	High (n = 141)		Lower	Upper	
<b>Age</b>							
>20	175	84 (48.0%)	91 (52.0%)	2.297	1.467	3.596	$P < 0.001$
≤20	156	106 (67.9%)	50 (32.1%)	Ref			
<b>Marital status</b>							
Single	299	174 (58.2%)	125 (41.8%)	0.718	0.346	1.491	$P < 0.373$
Married/Cohabiting	32	16 (50.0%)	16 (50.0%)	Ref			
<b>Resides with</b>							
Family, & relatives parents	50	24 (48.0%)	26 (52.0%)	1.564	0.855	2.86	$P < 0.145$
Others	281	166 (59.1%)	115 (40.9%)	Ref			
<b>Religion</b>							
Christians	323	187 (57.9%)	136 (42.1%)	0.436	0.103	1.857	0.293*
Muslims	8	3 (37.5%)	5 (62.5%)	Ref			
<b>Year of study</b>							
>Year 2	120	55 (45.8%)	65 (54.2%)	2.099	1.331	3.312	$P < 0.001$
Year 1 & 2	211	135 (64.0%)	76 (36.0%)	Ref			
<b>College</b>							
Health sciences	33	10 (30.3%)	23 (69.7%)	3.508	1.612	7.637	$P < 0.001$
Others	298	180 (60.4%)	118 (39.6%)	Ref			
<b>Has insurance cover</b>							
Yes	122	60 (49.2%)	62 (50.8%)	1.700	1.082	2.672	$P < 0.021$
No	209	130 (62.2%)	79 (37.8%)	Ref			
<b>Male involvement</b>							
Yes	13	5 (38.5%)	8 (61.5%)	0.625	0.164	2.388	$P < 0.491$
No	28	14 (50.0%)	14 (50.0%)	Ref			
Total	41	19 (46.3%)	22 (53.7%)				

\*Fisher's exact test (FET).

university students' fraternity. Female students aged 20 and above were about two times more likely to have ever utilized EC when compared with her colleagues who were less than twenty years of age (OR = 2.026; 95% CI: 0.991 - 4.143, P = 0.040). Being a student in the College of Health Sciences was significantly associated with utilization of Emergency contraceptives (OR = 2.756; 95% CI: 1.109 - 6.851, p = 0.025). Most students who were single were found to have ever used EC when they were assessed against those who were married or cohabiting (respectively, 20.9% against 14.3%). Nonetheless, this difference in the two grouped failed to attain statistical significance (p = 0.579). The respondents who were rated as having high level of knowledge reported having ever used EC in proportion almost equal to that of those who were rated on the contrary (19.8% and 20.6%, respectively, p = 0.892). On the other hand, being a student in the College of Health Sciences was associated with 2.8-fold increment in the probability of having ever used an EC (OR = 2.756; 95% CI: 1.109 - 6.851, p = 0.025). Other variables including religion, place of residence, and year of study and having an insurance cover were not associated with utilization of EC among the female university students as shown in **Table 7**.

### 3.6. Multivariate Logistic Regression

Variables that were significantly associated with level of knowledge and utilization of Emergency contraceptives in the bivariate analysis were subjected to multivariate analysis involving binary logistic regression. In the bivariate analysis, respondents' age, College of study, year of study and insurance coverage were significantly associated with level of knowledge and utilization of EC among the respondents. However, after these variables are subjected to multivariate analysis, respondents' age and being in College of study remained significantly associated with level of knowledge and utilization of EC. Being aged more than 20 years increased the likelihood of being knowledgeable about EC by about 89% (adjusted odds ratio (aOR) = 1.885; 95% CI: 1.062 - 3.345, p = 0.030). A student in the College of Health Sciences had about 5.6 fold increment in the probability of being knowledgeable about EC when compared to a student's enrolled in other different Colleges in the university (aOR = 5.565; 95% CI: 2.379 - 13.016, p < 0.001) (**Table 8**).

## 4. Discussion

Almost half (53%) of the study subjects attested to be sexually active at the time of the study which was higher than the findings of Mizan-Tepi University of South West Ethiopia at 38.4% [11] and Adama University at 29.4% [12]. Of the 53% sexually active female students, 20% reported to have ever used the emergency pill. This finding is consistent with the study carried out among female university students in KwaZulu-Natal in South Africa at 21.2%, where lack of knowledge of its use, cultural beliefs and misunderstanding about its utilisation were sited as probable reasons [13]. However, the percentage of use was slightly

**Table 7.** Relationship between utilisation of EC and selected variables, n = 203.

Characteristic	Total	Ever use		OR	95% CI		P value
		No (n = 162)	Yes (n = 41)		Lower	Upper	
<b>Age</b>							
>20	106	79 (74.5%)	27 (25.5%)	2.026	0.991	4.143	0.040
≤20	97	83 (85.6%)	14 (14.4%)	Ref			
<b>Marital status</b>							
Single	182	144 (79.1%)	38 (20.9%)	1.583	0.443	5.657	0.579*
Married/Cohabiting	21	18 (85.7%)	3 (14.3%)	Ref			
<b>Religion</b>							
Christians	196	158 (80.6%)	38 (19.4%)	0.321	0.069	1.493	0.148*
Muslims	7	4 (57.1%)	3 (42.9%)	Ref			
<b>Resides with</b>							
Family, relatives & parents	32	22 (68.8%)	10 (31.3%)	2.053	0.884	4.768	0.090
Others	171	140 (81.9%)	31 (18.1%)	Ref			
<b>Knowledge level</b>							
High	96	77 (80.2%)	19 (19.8%)	0.474	0.210	1.072	0.892
Low	107	85 (79.4%)	22 (20.6%)	Ref			
<b>College</b>							
Health Sciences	24	15 (62.5%)	9 (37.5%)	2.756	1.109	6.851	0.025
Others	179	147 (82.1%)	32 (17.9%)	Ref			
<b>Year of study</b>							
Year 3 or higher	75	60 (80.0%)	15 (20.0%)	0.981	0.482	1.997	0.957
Year 1 & 2	128	102 (79.7%)	26 (20.3%)	Ref			
<b>Has insurance cover</b>							
Yes	84	63 (75.0%)	21 (25.0%)	1.650	0.828	3.286	0.152
No	119	99 (83.2%)	20 (16.8%)	Ref			

\*Fisher's exact test (FET).

**Table 8.** Multivariate analysis.

Variable	$\beta$	Se ( $\beta$ ) <sup>†</sup>	aOR <sup>#</sup>	95% CI		P-value
				Lower	Upper	
<b>Age (Ref: ≤20 years)</b>	0.634	0.293	1.885	1.062	3.345	0.030
<b>College (Health Sciences VS. Others)</b>	1.717	0.434	5.565	2.379	13.016	<0.001
<b>Year of study (Ref: Year 1)</b>						0.233
Year 2	-0.447	0.331	0.639	0.334	1.223	0.176
Year 3	0.168	0.338	1.182	0.609	2.295	0.620
≥Year 4	0.419	0.353	1.52	0.76	3.039	0.236
<b>Insurance cover (Ref: No)</b>	0.382	0.247	1.464	0.903	2.375	0.122
Constant	-0.951	0.26	0.386			0.000

\*Beta coefficient, †Standard error of  $\beta$ , #Adjusted odds ratio.

lower compared to studies done among female university students in Nigeria at 33.9% [14] and in Ethiopia where 75% of the sexually active had ever used the Emergency contraception (EC) [15], probably due to presence of more liberal laws towards EC use in these countries. The fact that EC can be obtained without prescriptions and over the counter in the above sited study areas notwithstanding, it is distinct that being sexually active does not necessarily translate to actual use of EC.

The study revealed that there was high level of awareness of EC among the study subjects, 86.4%. This finding was higher than the level of awareness reported among college students in South West Ethiopia at 24.1% [11], Nepal at 66% [16], South Africa at 49.9% [12] and South Ethiopia at 72.2% [17]. Probably the higher level of learning of the study participants exposes the students to a higher level about matters appertaining to their sexuality. In this study awareness of the EC goes beyond the mayor indication of the EC for prevention of pregnancy after unprotected coitus but also on the limitation of the EC towards protection of sexually transmitted diseases. Majority (93%) knew that the emergency pill should be taken after sexual intercourse and 98% of them were aware that the EC does not protect against sexually transmitted infections/diseases, including HIV and AIDS.

The knowledge index used through scoring questions revealed that the EC knowledge level in this study was at 42.6%. This finding was lower than the finding of Debre Markos Higher Institutions, Northwest Ethiopia at 74.9% [18]. A similar criterion in assessing information on EC use, with comparable set of questions was used in a study in Adama University Ethiopia [19], the criterion could have been considerably strict hence reflecting the low level of EC knowledge. Knowledge on use of the pill revealed that only 34% knew that the EC can be used to a maximum of 120 hours after unprotected sexual intercourse. A considerable number (43%), identified with the maximum limit of 72 hours before use of EC after coitus and they were unaware about the use of EC up to 120 hours after sex as per the WHO current recommendation [20]. It is evident that a substantial number would miss taking the pill all together yet the spectrum of its effectiveness extends up to 120 hours after unprotected sexual intercourse. This implies that there could be misinformation about the timing of taking the pill beyond 72 hours after unprotected intercourse.

A minority, about 7% of the population that ever heard of EC was either not sure or felt that the EC should be used either before or after the coitus. The believe that EC is a hundred percent effective by 59% of the population is equally worrying. The emphasis that EC like other family planning methods is not 100 percent effective is a message that should be packaged when creating awareness about the method more so the efficacy of the pill versus the timeliness of taking the pill. Mass media was relied on as the main source of information of the EC by 82 percent of the female undergraduate students. More than half of the respondents, 54%, relied on friends to provide information on EC. The high level of

awareness could be because majority depended on the mass media as a source of information, through which awareness drives such as that done by the Kenyan government in 2008 on EC have ever been done. Popularity of friends as a source of information was also seen in a Nigerian study that established 64.9% of the students' sourced information on EC from both male and female friends [14]. Additionally, popularity of use of friends as a source of EC information was witnessed in the findings of a Cameroon study where 69.6% utilised informal sources of friends and family [15]. This phenomenon could be due to the ease with which mass media and friends are accessed, compared to other sources that would demand other added protocols to access such information. In this study, only 7.3% of the respondents sought information from health care workers. This was lower than what was observed in the Cameroon study 19.9% and in Nigerian study that reported 34.1% of the students obtained information from the health care workers [15].

The quick ease of accessing information from mass media may not compare with the access of information from the health care workers in either private or public institutions. From the study the underutilisation of health personnel and trainers as sources of EC knowledge to the university students is evident. More use of the mass media and peer educators is probably the most promising means of passing EC information. For those that used the EC, it is evident that the main reason they used was because they engaged in unprotected sex. Over 90% of the users do not store the pill for future use revealing that they could only buy the pill in unplanned circumstances of exposure to the risk of pregnancy. This refutes the media reports implying that many University students users of EC often store the EC pill for future use, however there is paucity of research done to give more information on this.

Furthermore bivariate analysis revealed that being in third year of study and above has a higher likelihood of one being more knowledgeable compared to those in lower levels of learning *i.e.* second and first year of learning (COR = 2.099; 95% CI :1.331 - 3.312), however this significance was not maintained in the multivariate logistic regression. However the finding was consistent with what was observed in Adama and Hawassa Universities of Ethiopia where the level of EC knowledge was found to increase with the level of education done [17] [19]. The current study also revealed that those who had insurance cover demonstrated a higher level of EC knowledge on bivariate analysis. This may be so because the virtue of owning a health insurance cover could depict a health conscious mind-set that could influence one to have more knowledge on EC. Regarding to EC utilization, respondents aged above twenty years were twice as likely to use the EC compared to those who were 20 years and below (OR 2.06 CI 0.991 - 4.143,  $p = 0.04$ ) and this was consistent with the findings of Adama University in Ethiopia [19].

**Multivariate analysis:** Age, college of study, level of study and having an insurance cover were the main determinants of knowledge and use of EC on biva-

riate analysis. However, when these variables were subjected to multivariate analysis, age and being in college of health sciences remain as significant determinants of both level of knowledge and utilization of Emergency contraception. Age was significantly associated with both knowledge and use of EC on logistics regression (aOR 1.885  $p = 0.003$ ). This finding was consistent with the finding of a study conducted in Adama University Central Ethiopia where students 20 years and above were three times likely to utilise EC compared to their younger counterparts [19]. This is probably due to the older ones being more exposed and having had more time of exposure to information while on campus. Being in college of health sciences was also significant on multivariate analysis (aOR = 5.565; 95% CI: 2.379 - 13.016,  $p < 0.001$ ). College of health sciences students had three times more likely to demonstrate EC knowledge and practice compared to students in other non-medical colleges. This result was in line with the Nigerian study at the University of Lagos where medical students' demonstrated good EC knowledge compared to the non-medical students. It is expected for medical students to have more knowledge regarding to EC than students from other fields. Information on EC is part of the expected detail taught in the curriculums for medical courses, hence the added advantage in the knowledge of the EC. By virtue of their study disciplines encompassing details of the EC, the medical students probably had the expected added reproductive health understanding on use of EC, a fact that could translate to more use of EC among them compared to their counterparts in other colleges.

The variation of information that the participants demonstrated on the particular aspects of EC probably informs the low use of the method. The reliance of EC information from friends is not a guarantee that they get accurate information either. Being unaware of efficacy levels of the EC, appropriate timing of taking the pill and the unclear timing to safely repeat the EC are worrying concerns that could affect the effectiveness of the EC in preventing unwanted pregnancy. This demonstrates that there is a risk for unwanted pregnancies if the sexually active group does not get the correct information on emergency contraception for use when need arises.

## 5. Conclusion

University of Nairobi female undergraduate students are aware of the existence of EC; however, there is low level of actual specific knowledge on EC particularly on correct timing of taking EC after unprotected sex. There is over estimation of the effectiveness of the EC. EC use is low, complemented with underutilisation of public facilities as a source of the EC and underutilisation of health workers as a source of EC information. Therefore, educative forums may be needed to improve the knowledge of EC among University of Nairobi female students. Health education on availability of EC in public facilities needs to be addressed. Possible use of informal sources of information such as peer education could be an area to explore in client education on EC knowledge and use. Further research is

recommended to establish factors that influence utilisation of public health workers as a source of EC information.

### Competing Interest

The author declared no competing interest.

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