

## Knowledge, Awareness and Practices regarding Emergency contraception in Undergraduate students: An Observational study

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### Abstract

**Introduction:** Unintended pregnancy remains a major challenge to the reproductive health of women especially in the developing countries. It is a major reason for unsafe abortion, a major contributor to maternal mortality. Emergency contraception (EC) is use of drug or device to prevent pregnancy after unprotected sexual intercourse. Unlike other regular methods of contraception which are taken prior to the sexual act, EC is used after the unprotected sex.

### Aims & Objectives:

This study was designed with an aim to assess the knowledge, awareness and practice of emergency contraception among medical undergraduates.

### Objectives

- To assess the gap between knowledge, perception and practice of emergency contraception among medical undergraduates
- To educate the young medical undergraduate to implement the knowledge into practice.

**Material and Method:** After approval from IEC, a questionnaire based cross sectional observational study was conducted in the Department of Obstetrics & Gynecology, Index Medical College Hospital & Research Center, Indore to evaluate the knowledge, awareness and practice of emergency contraception among 400 medical undergraduate students from 1<sup>st</sup> to 4<sup>th</sup> year and internship; enrolled in various medical courses (MBBS & BDS) in the university were selected in this study which was conducted over a period of six months from October 2023 to March 2024. Participants qualifying the inclusion criteria were enrolled and interviewed using pretested semi structured questionnaire to assess their knowledge, awareness and practice with emergency contraception. Data was analysed using SPSS version 20.0 software (SPSS, Chicago, IL, USA). Data were presented as percentages and tables. Association between variables was tested using the  $\chi^2$  test.

**Results:** A response rate of 73% was observed with majority of participants being females (53.55). About 18.5% of the participants had knowledge about using oral contraceptive pills (OCP) and intrauterine contraceptive devices (IUCD) as EC. 70% were aware that only OCP is used as an EC, while 18.5% said both OCP and IUCD can be used. 62.5% knew the timing of EC use within 72 hours of intercourse. 88% knew all situations under which an EC can be taken. The batch-wise difference in knowledge and attitude component was statistically significant, but not for attitude. Five participants had a sexual experience, and three out of them had used an EC.

**Conclusion:** The study revealed that there is a gap in knowledge, attitude and practices about emergency contraception in young college going students, leading to incorrect practices and unintended pregnancies ending up in abortions. The medical teaching system should address the lack of comprehensive knowledge about EC among future healthcare professionals, as EC is crucial for preventing pregnancy after unprotected sex or contraceptive accidents.

**Keywords:** Emergency contraception, undergraduate students, Knowledge, awareness, practice

## INTRODUCTION

One in five pregnancies in India are unplanned, making unintended pregnancy a serious threat to the reproductive health of young adults, particularly in developing nations. According to reports 78% of all pregnancies are unintentional of which approximately 25% are unwanted. As per the recent data the incidences are increasing exponentially. Unwanted pregnancies often force many young women to seek abortions, which are typically carried out in unsafe conditions. Further, women who continue their pregnancies are likely to have higher chances of morbidity and mortality in comparison to adult women.[1]

Around five million women in the developing world are admitted for induced abortion complications annually, with an average rate of 5.7 per 1000 women in all regions.[2] With decreasing age of menarche and coitarche, recent findings suggest that young people engage early in unplanned and unprotected sexual intercourse, which in most cases will lead to unwanted pregnancy.[3]

Emergency contraception (EC) refers to contraceptive method used to prevent pregnancy following unprotected sexual intercourse. It can prevent up to 95% of unwanted pregnancies if used within 5 days of intercourse. Emergency contraception (EC) is safe and effective without absolute medical contraindication or age restrictions. Emergency contraceptives are indicated if any other methods of contraception are not used, due to concerns about failure, missed pills, delayed administration of injectables, or in cases of sexual assault. The effectiveness of emergency contraceptives increases when used immediately after intercourse. Advanced provision of these contraceptives to women at risk can ensure their earliest intake following exposure, ensuring the earliest intake of contraceptives.[4]

Various emergency contraceptive options include levonorgestrel (LNG) pills, ulipristal acetate, combined oral contraceptive pills (OCP), and copper containing intrauterine contraceptive device (IUCD). [5,6] Emergency contraceptive pills (ECPs) prevent pregnancy by delaying or inhibiting ovulation, whereas copper IUCD acts by causing chemical changes in the sperm and ovum, thereby preventing fertilization and also affecting the endometrium. They neither interrupt nor are harmful to an established pregnancy.

Emergency contraceptive should be easily accessible to all in need and it should be included in all family planning programmes. They are especially important for adolescent girls because of the negative impact that unwanted pregnancy can have on them as compared to adults. So, many experts advocate ECPs to be easily accessible to young girls along with prior proper information regarding its use. Several researches revealed that users of emergency contraceptives are mainly adolescent girls and young women where the main reason for requesting emergency contraceptive was condom accident with a small percentage of women stating the reason as non-use of other forms of contraception. [7,8] In spite of frequent use, however, adolescents have poor knowledge about EC. [9]

As per the World Health Organization estimates, 210 million pregnancies occur annually, out of which, 38% are unwanted and 22% end up with abortion worldwide. In India, approximately 11 million abortions occur annually, with 6.7 million induced and 4 million spontaneous. Around 10-11 illegal abortions occur against each legal abortion, resulting in around 20,000 women losing their lives annually due to abortion complications. [10] Government of India approved the dedicated regimen of emergency contraceptives in year 2001 and the same was introduced in the National Family Health Welfare Program in 2003.[11] It was approval as over the counter for adults aged 18 and above by the Government of India in 2005. This was done to reduce the rates of unwanted pregnancy and unsafe abortion. [12] However, the fear of its use and improper use has failed to achieve the objective.

Preventing unwanted pregnancy is crucial for improving women's reproductive health. Adolescents in developed countries have high awareness about emergency contraceptives, with 61-93% of them being aware. [13-15] However, developing countries also have an increasing trend of early sexual activity, but lag behind developed countries in knowledge about emergency contraceptives, increasing the risk of unwanted pregnancies. 40-80% of females are sexually active by age 18. [16]

Despite the increase in sexual activity among young adults, there is no formal means of sexual education for the adolescents except perhaps those in medical education. This, therefore, leaves this high-risk group with insufficient and sometimes wrong knowledge of emergency contraception. This study was conducted in our institute over 6 months to assess the knowledge and practice of emergency contraception among medical undergraduates.

**Aims & Objectives:***Aim:*

This study was designed with an aim to assess the knowledge, awareness and practice of emergency contraception among medical undergraduates.

*Objectives*

- To assess the gap between knowledge, perception and practice of emergency contraception among medical undergraduates
- To educate the young medical undergraduate to implement the knowledge into practice.

**MATERIAL AND METHOD**

This questionnaire based cross sectional observational study was conducted in the Department of Obstetrics & Gynaecology, Index Medical College Hospital & Research Centre, Indore to evaluate the knowledge, attitude and practice of emergency contraception. Using purposive sampling technique, 400 medical undergraduates from all years and internship in various medical courses (MBBS & BDS) who were enrolled in the university were selected in this study which was conducted over a period of six months from October 2023 to March 2024.

*Inclusion Criteria:* Medical undergraduates enrolled in various years in various medical (MBBS & BDS) available and consented to participate in the study.

*Exclusion Criteria:* Students who did not consented to participate in the study. Students who were sick and unable to communicate during data collection were excluded.

Data was collected using predesigned, self-administered questionnaire in English. Demographic details of the respondents like age, gender, marital status, education, residence (urban/rural), parental education, socioeconomic status, and religion were also recorded. A 24-item questionnaire was constructed to assess their knowledge about emergency contraceptive, based on review of literature. Answers to each question had multiple options, some correct and some wrong. The option of no knowledge was also provided. Some items had only three options: yes or no or no knowledge. confidentiality of the collected information was maintained. Data was entered in MS office Excel 2010 and analysed using SPSS software 20.0 version and relevant frequencies, proportions, and percentages were calculated.

All students were informed about the objectives of the study and assured that the information collected would be treated as confidential and used only for research purposes. Only those students who gave a written informed consent were administered the questionnaire. The questionnaire was administered to the student in their class rooms. The students were adequately spaced during the questionnaire administration to avoid any communication. Due clarification was provided to students who asked for it regarding any of the item in the questionnaire. No names or other identifying information were included except the gender on the self-administered questionnaire to ensure anonymity. The study has been approved by the Institution Ethics Committee.

**RESULTS**

This study was conducted to assess the up-to-date knowledge of undergraduate medical students about EC in particular and overall knowledge about contraception in general. The evaluation was based on a leaflet with 24 questionnaires. With regards to demographic variables majority of the respondents were from good family background. Results of the study are tabulated in Tables 1 and Table 2

Of the total students approached in the medical college, 200 out of a total of 275 students agreed to participate in the study giving us a response rate of 73%. Females contributed to 53.5% (107/200) of the study population. The demographic characteristics of the participants are shown in Table 1. It is seen that 31% (62/200) participants had a rural background, 64.5% (129/200) having annual family income <50,000 rupees, and 58.5% (117/200) were Hindu by religion. (Table 1)

**Table 1** Participant's demographic variables

Variable	First year (n=65)	Second year (n=34)	Third year (n=43)	Final year (n=38)	Intern (n=20)
<b>Age (years)</b>					
< 20	50 (76.9%)	25 (73.5%)	00 (0)	00 (0)	00 (0)
20	15 (23.1%)	9 (26.5%)	43 (100%)	38 (100%)	20 (100%)
<b>Gender</b>					
Male	29 (44.6%)	21 (61.8%)	21 (48.8%)	13 (34.2%)	9 (45%)
Female	36 (55.4%)	13 (38.2%)	22 (51.2%)	25 (65.8%)	11 (55%)

<b>Residence</b>					
Rural	21 (32.3%)	9 (26.5%)	13 (30.2%)	10 (26.3%)	9 (45%)
Urban	45 (67.7%)	25 (73.5%)	30 (69.8%)	28 (23.7%)	11 (55%)
<b>Religion</b>					
Hindu	37 (56.9%)	21 (61.7%)	23 (53.5%)	23 (60.5%)	13 (65%)
Muslim	18 (27.7%)	9 (26.5%)	12 (27.9%)	11 (28.9%)	7 (35%)
Sikh	5 (7.7%)	2 (5.9%)	6 (13.9%)	03 (7.9%)	00 (0%)
Others	5 (7.7%)	2 (5.9%)	2 (4.7%)	01 (2.6%)	00 (0%)
<b>Family income</b>					
<50,000	34 (52.3%)	20 (58.8%)	28 (65.1%)	30 (78.9%)	17 (85%)
50,000-100,000	26 (40%)	14 (41.2%)	12 (27.9%)	7 (18.4%)	03 (15%)
>100,000	5 (7.7%)	00 (0)	03 (7%)	00 (0%)	00 (0%)
<b>Maternal education status</b>					
Illiterate	3 (4.6%)	00 (0%)	01 (2.4%)	02 (5.3%)	01 (5%)
Upto SSC	16 (24.6%)	10 (29.4%)	11 (25.6%)	8 (21%)	9 (45%)
Upto HSC	4 (6.2%)	6 (17.6%)	10 (23.2%)	10 (26.3%)	04 (20%)
Graduate	26 (40%)	10 (29.4%)	11 (25.6%)	15 (39.5%)	04 (20%)
Postgraduate	16 (24.6%)	8 (23.6%)	10 (23.2%)	03 (7.9%)	02 (10%)

Table 2 provides information on knowledge, attitude and practice of the participants. About 18.5% (37/200) of all subjects had knowledge about use of both oral contraceptive pill (OCP) and Intra Uterine Contraceptive Device (IUCD) being as Emergency contraception (EC). Out of these 09, 24.3% were students of final professional of MBBS. Further, 70% (140/200) were aware that only OCP is used as an EC and 18.5% (37/200) said both OCP and IUCD can be used. Knowledge about the timing of use of emergency contraception is in 62.5% (125/200) as knowing it to be used within 72 h of intercourse. All the situations under which an emergency contraception can be taken were known to 88% (176/200) of the participants. The batch wise difference in knowledge and attitude component of knowledge, attitude, and practice was statistically significant ( $P < 0.05$ ). The same is not true for the attitude component wherein the difference between batches was not found statistically significant. Importantly, five participants had a sexual experience and three out of these five had used an EC.

**Table 2. Knowledge of participants about emergency contraceptives**

Variable	First year (n= 65)	Second year (n=34)	Third year (n=43)	Final (n= 38)	Intern (n= 20)	Statistics
<b>KNOWLEDGE COMPONENT</b>						
<b>Which can be used as emergency contraceptive?</b>						$\chi^2=101.2$ $df=16$ $P=0.000$ (significant)
OCP	49 (75.3%)	25 (73.6%)	34 (79%)	28(73.7%)	04 (20%)	
IUCD	04 (6.2%)	01 (2.9%)	02 (4.7%)	01 (2.6%)	01 (5%)	
OCP + IUCD	06 (9.2%)	06 (17.7%)	04 (9.3%)	9 (23.7%)	12 (60%)	
Injection implant	02 (3.1%)	01 (2.9%)	01 (2.3%)	00 (00)	00 (00)	
Others	04 (6.2 %)	01 (2.9 %)	02 (4.7 %)	00 (00)	03 (15 %)	
<b>When should EC pill be taken?</b>						$\chi^2=152.42$ $df=16$ $P=0.000$ (significant)
Anytime	00 (0%)	01 (2.9%)	00 (0%)	00 (0%)	00 (0%)	
During intercourse	00 (0%)	01 (2.9%)	00 (0%)	00 (0%)	00 (0%)	
Within 24 h of intercourse	27 (41.5%)	03 (8.8%)	04 (9.3%)	34(89.4%)	02 (10%)	
Within 72 h of intercourse	36 (55.4%)	27 (79.4%)	38 (88.4%)	03 (7.9%)	18 (90%)	
I don't know	02 (3.1 %)	02 (5.9 %)	01 (2.3 %)	01 (2 .6%)	00 (0 %)	

<b>What is the drug composition of ECP as compared to regular pills?</b>						$\chi^2=21.84$ $df=12$ $P=0.000$ (significant)
Same	10 (15.4%)	01 (2.9%)	00 (0%)	00 (0%)	00 (0%)	
Higher doses of hormones	41 (63.1%)	23 (67.6%)	34 (79.1%)	35(92.1%)	19 (95%)	
Completely different	9 (13.8%)	03 (8.8%)	05 (11.6%)	03 (7.9%)	01 (5%)	
Don't know	5 (7.7 %)	07 (20 .6%)	04 (9.3 %)	00 (0 %)	00 (0 %)	
<b>Mechanism of action?</b>						$\chi^2=54.82$ $df=16$ $P=0.000$ (significant)
Prevents pregnancy	03 (4.6%)	05 (14.7%)	01 (2.3%)	02 (5.2%)	04 (20%)	
Prevent implantation	31 (47.7%)	18 (52.9%)	17 (39.5%)	16(42.1%)	9 (45%)	
Prevent ovulation and implantation	29 (44.6%)	9 (26.5%)	24 (55.8%)	20(52.6%)	6 (30%)	
Induce abortion	00 (0%)	02 (5.9%)	00 (0%)	00 (0%)	01 (5%)	
Don't know	02 (3 %)	00 (0 %)	01 (2.3 %)	00 (0 %)	00 (0 %)	
<b>Effectiveness of EC in preventing pregnancy?</b>						$\chi^2=61.22$ $df=16$ $P=0.000$ (significant)
Highly effective (99%)	42 (64.6%)	18 (52.9%)	29 (67.4%)	31(81.6%)	12 (60%)	
75%	10 (15.4%)	06 (17.6%)	08 (18.6%)	04(10.5%)	07 (35%)	
50%	8 (12.3%)	01 (2.9%)	01 (2.3%)	00 (0%)	00 (0%)	
<50%	00 (0%)	01 (2.9%)	00 (0%)	00 (0%)	00 (0%)	
Don't know	05 (7.7%)	08 (23.5%)	05 (11.6%)	03 (7.9%)	01 (5%)	

**Table 3. Attitude of participants about emergency contraceptives**

Variable	First year (n=65)	Second year (n=34)	Third year (n=43)	Final year (n=38)	Intern (n=20)	Statistics
<b>ATTITUDE COMPONENT</b>						
<b>Situations in which EC pills to be taken to prevent unwarranted pregnancy?</b>						$\chi^2=236.253$ $df=20$ $P=0.000$ (significant)
Forceful intercourse	00 (0%)	02 (5.8%)	00 (0%)	01 (2.6%)	00 (0%)	
Condom damage	00 (0%)	02 (5.8%)	00 (0%)	00 (0)	00 (0%)	
Missed OCP	00 (0%)	01 (2.9%)	00 (0%)	00 (0%)	00 (0%)	
Unsafe intercourse	00 (0%)	17 (50%)	00 (0%)	00 (0%)	00 (0%)	
All	64(98.4%)	12(35.3%)	43(100%)	37(97.4%)	20(100%)	
Don't know	01 (1.6%)	00 (0%)	00 (0%)	01 (2.6%)	00 (0%)	

**Table 4. Practice of participants about emergency contraceptives**

Variable	First year (n= 65)	Second year (n=34)	Third year (n=43)	Final (n= 38)	Intern (n= 20)	Statistics
<b>PRACTICE COMPONENT</b>						
<b>Sexual experience</b>						$\chi^2=1.64$ $df=4$ $P=0.823$
Yes	01 (01)	01 (01)	01 (01)	00 (01)	01(5%)	
No	64 (98)	33 (98)	42 (98)	38 (100 %)	19(9 5%)	

						(nonsignificant)
<b>Use of contraceptives</b>						$\chi^2=0.74$ df=1 P=0.376 (nonsignificant)
Used	01 (00)	01 (01)	01 (01)	00 (0)	00 (0)	
Not used	64 (99)	33 (98)	42 (98)	38 (100 %)	20(100 %)	

## DISCUSSION

Emergency contraception (EC) is use of drug or device to prevent pregnancy after unprotected sexual intercourse. Unlike other regular methods of contraception which are taken prior to the sexual act, emergency contraception is used after the unprotected sex.

The Government of India launched the family planning program in 1952 with the objective of reducing birth rate. Under the family planning program, temporary and permanent methods of contraception were introduced by the Department of Family Welfare, Government of India.[17] However, contraceptive failure and unwanted pregnancy lead to high abortion rate. EC or postcoital contraception prevents unwanted pregnancy after unprotected sexual intercourse and failure of regular contraception.[18]

An Indian Council of Medical Research study in India documented 6.1/1000 legal abortions and 13.5/1000 illegal abortions performed in country.[19] One of the causes of illegal pregnancy is unplanned pregnancy due to multiple reasons. Emergency contraceptive gives a second chance at prevention in cases of unanticipated sexual activity. So, one of the strategies to avoid unintended pregnancy is increased awareness and use of EC. [20] Keeping this in view, the current study was planned. The study population chosen for this purpose was the medical students. The idea was to assess the level of awareness among future health care providers. It is these health care providers, who will be main drivers of our health care delivery.

The correct knowledge in this study about both IUD and OCP being used as emergency contraception was present only among 18.5% participants. Further 70% of study participants reported that only OCP's can be used as emergency contraception. This was in concurrence with studies done by Gupta RK et al. [20] and Puri S et al. [21] Gupta RK et al. reported that only 20.4% of participants correctly understood that both IUD and OCP can be used as EC, while 70% reported only OCPs as suitable. Study on female graduates in Chandigarh by Puri S et al. revealed similar findings with 73% reporting OCP's as the only method of emergency contraception. [21]

In our study, Majority (94.5%) of participants were aware that EC drug composition has higher dose of hormones as compared to regular contraceptives. This was higher than reported by Gupta RK et al. who reported that 77% of participants were aware that emergency contraception (EC) drug composition has higher dose of hormones as compared to regular contraceptives. [20]

In our study, preventing implantation as a mechanism of action of EC was known to 41.5% students and awareness of emergency contraception (EC) preventing ovulation and implantation was known to 44%. This was in concurrence with studies done by Gupta RK et al. who reported that 45.1% students were aware that EC acts by preventing implantation whereas 44.9% thought that emergency contraception (EC) prevents both ovulation and implantation. Similarly, Singh et al. in a study conducted in Delhi on doctors showed that 50% of doctors were aware of emergency contraception action of blocking implantation of the fertilized ovum.[23] Farooq F et al. reported similar incidence of knowledge amongst doctors i.e., 41.43% Kashmir Valley. [24] Further 26% of doctors in Delhi and 57.15% of doctors in Kashmir Valley mentioned that emergency contraception interferes with fertilization. Only 6.8% of respondents in Delhi and 8.58% of respondents in Kashmir Valley knew that it prevents ovulation. [23,24]

In our study three students (1.5%) in our study said EC induces abortion. Similar results were reported by Gupta RK et al. However, Kongnyuy EJ et al. reported 51.2% of students at university of Beau and 25.8% of students at the university students of Ghana had knowledge that EC induces abortion. [25] The difference in percentage could be ascribed to the difference in the education backgrounds of the study participants. Further 25.5% of medical students from central India,[26] 22% of gynecologists of Nagpur,[27] 49% nursing students of Nairobi,[28] 8.58% of doctors of Kashmir Valley,[24] and 8.1% of doctors of Delhi reported a higher percentage that participants from our study.[23]

All the indications of emergency contraception (EC) usage were known accurately to 88.3% of students. The percentage increased as we moved toward higher years. 100% of final year and internship student knowing the emergency contraception (EC) usage accurately.

The importance of awareness regarding EC among medical students cannot be emphasized more and therefore unawareness about proper method of use of EC may serve as a deterrent to our family welfare programs. This will not only lead to unwanted pregnancy but also may create health hazards. The lack of appropriate in-depth knowledge of EC among these future health care professionals should alarm the medical teaching system. emergency contraception (EC) is the only method that can be used to prevent pregnancy after unprotected sex or contraceptive accident. Acquiring knowledge by remembering has been a part of medical education, but if integrated with skill-based learning from early years of medical school can prove beneficial for health care system. Limitations: The study has been limited to medical students of a single institution only. The study could have been extended to other medical college in the area.

## CONCLUSION

The lack of appropriate in-depth knowledge of emergency contraception (EC) among medical students is a cause of concern. It should alarm the medical teaching system as emergency contraception is the only method that can be used to prevent pregnancy after unprotected sex or contraceptive accident. The study revealed that there is a gap in knowledge, attitude and practices about emergency contraception in young college going students, leading to incorrect practices and unintended pregnancies ending up in abortions.

## Declarations

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*Conflicts of interest:* There are no conflicts of interest.

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