

Prevalence and Pattern of Emergency Contraception Use Among Female Medical Students in Alex Ekwueme Federal University Ndufu-Alike, and Ebonyi State University Abakaliki, Ebonyi State, Nigeria

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Abstract

Background

Emergency contraception (EC) provides an important opportunity to prevent unintended pregnancy after unprotected intercourse or contraceptive failure. Although awareness of EC is generally high among young women (especially medical students) in sub-Saharan Africa, utilization may remain substantially lower. This study assessed the prevalence, patterns, barriers and factors associated with EC use among female medical students in two universities in Ebonyi State, South-East Nigeria.

Methods

A descriptive cross-sectional study was conducted among female undergraduate medical students of Ebonyi State University, Abakaliki, and Alex Ekwueme Federal University Ndufu-Alike, Ebonyi State, Nigeria, from 9 June to 21 July 2025. A target sample of 448 participants was proportionately allocated across 12 institution-by-academic-level strata using the Hamilton largest-remainder method, followed by simple random selection within strata. Data were collected using a pretested self-administered structured questionnaire and analysed using SPSS version 26. Descriptive statistics, chi-square tests and binary logistic regression were used. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported.

Results

Of 448 respondents, 314 (70.1%) were aged 21–25 years and 410 (91.5%) were single. Awareness of EC was 85.7%, with lectures/classes (56.0%) and healthcare providers (48.9%) as the leading sources of information. Ever-use of EC was reported by 102 (22.8%) respondents. Among EC users, 73.5% reported taking EC within 24 hours of unprotected intercourse and 84.3% reported use of a morning-after pill. Pharmacy was the commonest source (78.4%). Frequently reported barriers among all respondents were high cost (92.6%), limited availability (90.6%), lack of information (89.7%) and fear of stigma or judgement (58.0%). In multivariable logistic regression, married respondents had higher odds of EC use than those who were not married (AOR 10.03, 95% CI 4.22–22.84; $p < 0.001$), whereas reported high cost, lack of availability, fear of stigma/judgement and lack of information were associated with lower odds of use.

Conclusion

Awareness of EC was high, but utilization was considerably lower among female medical students in the two universities studied. Improving affordability, availability and access to accurate, stigma-free information within university settings may help narrow the gap between awareness and utilization.

Background

Emergency contraception (EC) refers to contraceptive methods that can be used after unprotected sexual intercourse to prevent pregnancy. It is indicated following unprotected intercourse, contraceptive failure or incorrect use, and following sexual assault when effective contraceptive protection is absent. Current World Health Organization (WHO) guidance recognizes levonorgestrel, ulipristal acetate, combined oral contraceptives and the copper-bearing intrauterine device (IUD) as emergency contraceptive options. EC is most effective when used as soon as possible after intercourse and can be used within five days, depending on the method.^{1,2}

The public-health importance of EC is particularly relevant in settings where unintended pregnancy may lead to unsafe abortion and associated morbidity, a concern documented in Nigerian evidence on unintended pregnancy and abortion among young people.³ Evidence from sub-Saharan Africa indicates that awareness of EC has generally increased over time, but utilization remains lower than awareness, with substantial variation between countries and study populations.^{4,5} A systematic review and meta-analysis among female university students in Ethiopia similarly found substantial heterogeneity in EC practice, while knowledge and marital status were among factors associated with utilization.⁶

In Nigeria, evidence from university populations demonstrates a persistent gap between awareness and appropriate use. Studies have reported substantial variation in awareness and utilization across regions and institutions.^{7–8} In a large study of sexually active female university students, awareness was 72.6% and ever-use was 54.1%, while other studies have reported considerably lower utilization.^{9,10} Differences between studies may reflect differences in eligibility criteria, measurement of 'use', availability of EC, and the social and institutional environments in which students obtain contraceptive information and commodities.

South-East Nigeria has generated several studies demonstrating both high awareness and persistent misconceptions or suboptimal practice. Among female undergraduates in Imo State University, awareness was 85.1%, but correct knowledge of the effective time interval was much lower and use was concentrated among sexually active students.¹¹ Earlier work among female undergraduates in South-Eastern Nigeria also documented gaps in knowledge and reliance on incorrect or unconventional methods.¹² Qualitative evidence from Nigerian universities has further described misconceptions about EC and the use of non-emergency pills or unproven remedies, highlighting the importance of accurate information and accessible services.^{13,14}

Evidence from Abakaliki is particularly relevant. Previous studies in the city reported lower levels of awareness and use among university students, while later work suggested that medical education was associated with better knowledge among female medical students.^{15,16} However, these studies were conducted several years ago and do not fully describe the current pattern of EC use, access barriers and factors associated with EC use among female medical students across the two major medical-training institutions serving the area.

The present study therefore assessed the prevalence, patterns, barriers and factors associated with EC use among female medical students of Ebonyi State University, Abakaliki, and Alex Ekwueme Federal University Ndufu-Alike, Ebonyi State, Nigeria. The findings are intended to provide locally relevant evidence for university-based reproductive health education and youth-friendly contraceptive services.

Methods

Study design

This was a descriptive cross-sectional study. The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidance.¹⁷

Study setting

The study was conducted among undergraduate medical students of Ebonyi State University (EBSU), Abakaliki, and Alex Ekwueme Federal University Ndufu-Alike (AEFUNAI), Ebonyi State, Nigeria. EBSU is located in Abakaliki, the capital of Ebonyi State, while AEFUNAI is located at Ndufu-Alike in Ikwo Local Government Area of Ebonyi State. Both institutions provide undergraduate medical education and draw students from diverse socioeconomic, cultural and religious backgrounds. The study was undertaken from 9 June to 21 July 2025.

Study population

The study population comprised all female undergraduate medical students enrolled at the two participating institutions across academic levels 100–600. Students who declined participation or returned incomplete questionnaires were excluded.

Sample size determination

The minimum sample size for the cross-sectional study was estimated using the Cochran formula: $n = Z^2p(1 - p)/d^2$. Here, Z is the standard normal deviate corresponding to a 95% confidence level (1.96; $\alpha = 0.05$), p is the assumed prevalence (0.50, used because no prior estimate specific to the combined study population was available), and d is the desired precision (0.05). Thus, $n = (1.96^2 \times 0.50 \times 0.50)/(0.05^2) = 384.16$, rounded to 384 participants. A final target sample of 448 participants was adopted for the study. The 448 participants were then proportionately allocated across the predefined institution-by-academic-level strata.

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Sampling technique

Proportionate stratified random sampling was used. The sampling frame contained 1,038 eligible female medical students: 501 from EBSU and 537 from AEFUNAI. The 12 strata comprised the six academic levels (100–600 level) within each institution. The proportional allocation for each stratum was calculated as $n_h = (N_h/N) \times 448$. Because proportional allocation generated fractional sample sizes, the Hamilton largest-remainder method was used to convert the quotas to whole numbers while preserving proportional representation. The final allocation was 217 participants from EBSU and 231 from AEFUNAI. Within each stratum, participants were selected by simple random sampling using the relevant class registers as sampling frames.

Data collection instrument

Data were collected using a structured, pretested, self-administered questionnaire adapted from previously published Nigerian studies and modified to the local context. The questionnaire comprised four sections covering socio-demographic characteristics; awareness and sources of information about EC; attitudes and accessibility; and utilization history, reasons for use, methods used and timing of use.

Pretesting and reliability

The questionnaire was pretested among 20 medical students at David Umahi Federal University of Health Sciences who were not included in the study. Feedback was used to refine ambiguous items. Internal consistency of the instrument was assessed using Cronbach's alpha and yielded a coefficient of 0.80.

Data collection procedure

Data were collected over six weeks, from 9 June to 21 July 2025, by trained research assistants. Questionnaires were administered during lecture-free periods and completed individually by participants. Completed questionnaires were retrieved immediately after completion.

Data analysis

Data were coded and analysed using IBM SPSS Statistics version 26. Descriptive statistics were used to summarize socio-demographic characteristics, awareness, utilization patterns, barriers and attitudes.

Categorical variables were summarized using frequencies and percentages, while continuous variables were summarized using means and standard deviations. Associations between categorical variables were assessed using chi-square tests. The primary outcome for the regression analysis was ever-use of EC, coded as a binary variable (yes/no). Independent variables included age group, marital status, place of residence and the reported access barriers presented in the regression model. Binary logistic regression was used to estimate crude odds ratios (CORs) and adjusted odds ratios (AORs) with 95% CIs. For categorical independent variables with more than two levels, indicator coding was used with the specified reference category. Statistical significance was set at $p < 0.05$.

Ethical considerations

Ethical approval was obtained from the Health Research and Ethics Committee of Alex Ekwueme Federal University Teaching Hospital, Abakaliki (Ref: AE-FUTHA/REC/VOL3/2025/488). Written informed consent was obtained from each participant before enrollment. Participation was voluntary and confidentiality was maintained by excluding personal identifiers from the study instrument and analysis. The study was conducted in accordance with the Nigerian National Code of Health Research Ethics and the Declaration of Helsinki.

Results

Table 1
Basic characteristics of respondents (n = 448).
SD, standard deviation.

Variable	N	%
Age ≤ 20 years	77	17.2
Age 21–25 years	314	70.1
Age ≥ 26 years	57	12.7
Mean age ± SD (years)	22.89 ± 2.50	—
Single	410	91.5
Married	36	8.0
Divorced/separated	2	0.4
On-campus residence	209	46.7
Off-campus residence	239	53.3

Table 1 shows the basic characteristics of the respondents. A total of 448 female medical students participated in the study. The mean age was 22.89 ± 2.50 years. Most respondents (314, 70.1%) were aged 21–25 years, while 77 (17.2%) were aged 20 years or younger and 57 (12.7%) were aged 26 years or older. Most respondents were single (410, 91.5%), and 239 (53.3%) lived off campus.

Table 2
Awareness and sources of information
about emergency contraception

Variable	N	%
Ever heard of EC: Yes	384	85.7
Ever heard of EC: No	64	14.3
Lectures/classes*	251	56.0
Healthcare providers*	219	48.9
Media*	163	36.4
Friends/peers*	161	35.9

(n = 448). *Multiple responses permitted.

Table 2 shows the awareness and sources of information about emergency contraception among the respondents. 384 (85.7%) respondents reported awareness of EC. The leading sources of information were lectures/classes (251, 56.0%) and healthcare providers (219, 48.9%), followed by media (163, 36.4%) and friends/peers (161, 35.9%).

Table 3
Patterns of emergency contraception utilization.

Utilization variable	N	Denominator	%
Ever used EC: Yes	102	448	22.8
Ever used EC: No	346	448	77.2
EC use in past year: Once	53	102	52.0
EC use in past year: 2–3 times	23	102	22.5
EC use in past year: 3 times	26	102	25.5
Morning-after pill	86	102	84.3
IUD	6	102	5.9
COC	10	102	9.8
Unprotected sex	84	102	82.4
Failure of another contraceptive method	9	102	8.8
Sexual assault	9	102	8.8
Within 24 hours	75	102	73.5
24–48 hours	17	102	16.7
48–72 hours	10	102	9.8
Pharmacy	80	102	78.4
Health clinic/hospital	13	102	12.7
Friends/relatives	6	102	5.9
Online/other	3	102	2.9
Side effects: Yes	45	102	44.1
Side effects: No	57	102	55.9

Table 3 depicts the pattern of emergency contraceptive utilization among the respondents. Ever-use of EC was reported by 102 (22.8%) respondents, while 346 (77.2%) had never used EC. Among the 102 EC users, 53 (52.0%) had used EC once in the preceding year, 23 (22.5%) had used it 2–3 times and 26 (25.5%) had used it more than three times. The morning-after pill was the most frequently reported method (86, 84.3% of users), followed by combined oral contraceptive pills (10, 9.8%) and IUDs (6, 5.9%). Unprotected intercourse was the most common reason for use (84, 82.4%). Most users (75, 73.5%) reported taking EC within 24 hours of intercourse. Pharmacies were the predominant source (80, 78.4%). Forty-five users (44.1%) reported side effects.

Table 4
Barriers and attitudes toward emergency contraception

Barrier/attitude	n	%
High cost*	415	92.6
Limited availability*	406	90.6
Fear of stigma/judgement*	260	58.0
Lack of information*	402	89.7
EC should be readily available to students: Yes	377	84.2
Sufficient EC education in academic programme: Yes	192	42.9
No	168	37.5
Not sure	88	19.6
Would recommend EC to a friend: Yes	264	58.9
No	88	19.6
Maybe	96	21.4

(n = 448). *Multiple responses permitted.

Table 4 highlights the barriers and attitudes toward emergency contraception among the respondents. The most frequently reported barriers to access among all respondents were high cost (415, 92.6%), limited availability in nearby pharmacies/clinics (406, 90.6%), lack of information (402, 89.7%) and fear of stigma or judgement (260, 58.0%). A total of 377 (84.2%) respondents supported making EC readily available to students. Only 192 (42.9%) felt that their academic programme provided sufficient education on EC. A total of 264 (58.9%) reported that they would recommend EC to a friend in need.

Table 5
Binary logistic regression analysis of predictors of ever-use of emergency contraception (n = 448)

Predictor	EC use Yes n (%)	EC use No n (%)	COR (95% CI)	p	AOR (95% CI)	p
Age ≤ 20 years	13 (16.9)	64 (83.1)	0.376 (0.168– 0.842)	0.017	0.733 (0.260– 2.068)	0.557
Age 21–25 years	69 (22.0)	245 (78.0)	0.521 (0.284– 0.955)	0.035	0.977 (0.438– 2.176)	0.954
Age ≥ 26 years	20 (35.1)	37 (64.9)	1.00	—	1.00	—
Married	25 (69.4)	11 (30.6)	9.888 (4.665– 20.957)	< 0.001	10.032 (4.221– 22.842)	< 0.001
Not married	77 (18.7)	335 (81.3)	1.00	—	1.00	—
On-campus	43 (20.6)	166 (79.4)	0.790 (0.506– 1.234)	0.301	1.042 (0.608– 1.784)	0.882
Off-campus	59 (24.7)	180 (75.3)	1.00	—	1.00	—
High cost: Yes	83 (20.0)	332 (80.0)	0.184 (0.089– 0.383)	< 0.001	0.301 (0.120– 0.753)	0.010
High cost: No	19 (57.6)	14 (42.4)	1.00	—	1.00	—
Lack of availability: Yes	77 (19.0)	329 (81.0)	0.159 (0.082– 0.309)	< 0.001	0.155 (0.079– 0.341)	< 0.001
Lack of availability: No	25 (59.5)	17 (40.5)	1.00	—	1.00	—
Fear of stigma/judgement: Yes	43 (16.5)	217 (83.5)	0.433 (0.276– 0.679)	< 0.001	0.385 (0.228– 0.651)	< 0.001
Fear of stigma/judgement: No	59 (31.4)	129 (68.6)	1.00	—	1.00	—
Lack of information: Yes	83 (20.6)	319 (79.4)	0.370 (0.196– 0.697)	0.002	0.341 (0.160– 0.728)	0.005
Lack of information: No	19 (41.3)	27 (58.7)	1.00	—	1.00	—

Table 5 shows the predictors of emergency contraception utilization among the respondents. Married respondents were about ten times more likely to use emergency contraception compared with unmarried

respondents (AOR = 10.032, 95% CI: 4.221–22.842, $p < 0.001$). High cost reduced the likelihood of utilization by approximately 70% (AOR = 0.301, 95% CI: 0.120–0.753, $p = 0.010$), while lack of availability reduced utilization by about 85% (AOR = 0.155, 95% CI: 0.079–0.341, $p < 0.001$). Fear of stigma or judgment was associated with a 62% reduction in use (AOR = 0.385, 95% CI: 0.228–0.651, $p < 0.001$), and lack of information reduced the likelihood of emergency contraceptive utilization by about 66% (AOR = 0.341, 95% CI: 0.160–0.728, $p = 0.005$). All these factors were statistically significant predictors of emergency contraceptive use.

Discussion

This study found high awareness of EC (85.7%) but substantially lower ever-use (22.8%) among female medical students in EBSU and AEFUNAI. Lectures/classes and healthcare providers were the leading information sources. Among the 102 respondents who had used EC, nearly three-quarters reported taking it within 24 hours of intercourse and the morning-after pill was the predominant method. Cost, availability, lack of information and stigma were the most frequently reported barriers. In adjusted analysis, married respondents had higher odds of use, while each of the four reported access barriers was associated with lower odds of EC utilization.

The awareness level observed in this study is broadly consistent with the relatively high awareness reported among university populations in Nigeria and elsewhere in sub-Saharan Africa. In Imo State University, awareness was 85.1%, while a Kano study reported awareness of 89.3%.^{11,18} A scoping review of EC in sub-Saharan Africa found awareness levels ranging widely between studies but concluded that awareness has generally increased over time and that utilization remains lower than awareness.⁴ The high awareness in the present study may partly reflect the participants' medical training and the greater exposure of health-profession students to reproductive health information.

The predominance of lectures/classes and healthcare providers as information sources is noteworthy. In several Nigerian university studies, informal sources such as friends and the media have been prominent.^{9,10,18} The greater contribution of formal educational sources in this study may reflect the medical curriculum and the professional orientation of the participants. However, high awareness should not be equated with comprehensive or correct knowledge. Previous Nigerian research has demonstrated that students may recognize EC while remaining uncertain about its timing, mechanism, appropriate methods and safety.^{11,12,13}

Only 22.8% of respondents had ever used EC. This is lower than the 54.1% ever-use reported among sexually active never-married female university students in a large Nigerian study, and lower than the 39.9% use reported among sexually active students in an Imo State University study.^{11,9} Differences in the denominator and eligibility criteria are important when comparing these estimates: the present study reports ever-use among all 448 respondents, whereas some previous studies restricted analyses to sexually active participants or those who had a recent risk of unintended pregnancy. A 2022 study

among female undergraduates in Ibadan also found substantial gaps between awareness and practice, reinforcing the heterogeneity of EC utilization across Nigerian university settings.¹⁹

Among users in the present study, the morning-after pill accounted for 84.3% of reported EC use. This predominance of oral levonorgestrel-based EC is consistent with Nigerian and sub-Saharan African literature, where levonorgestrel products are commonly the most accessible EC method.^{4,9,18} WHO identifies levonorgestrel and ulipristal acetate pills, combined oral contraceptives and the copper IUD as EC options, with effectiveness greatest when used promptly.¹ The high proportion of users taking EC within 24 hours is therefore encouraging. Nevertheless, the absence of reported ulipristal use and the low reported use of IUDs may reflect differences in availability, provider access, familiarity and acceptability rather than clinical preference alone.

Pharmacies were the predominant source of EC among users (78.4%). This finding is consistent with evidence that pharmacies and other private-sector outlets are important access points for EC in sub-Saharan Africa.^{4,9} Pharmacy access can offer convenience and privacy, which may be particularly relevant for young adults concerned about stigma. WHO's current self-care recommendation strongly supports over-the-counter availability of emergency contraceptive pills without a prescription, reinforcing the importance of accessible, non-judgmental channels for obtaining EC.²

The high frequency of reported barriers is one of the most important findings of this study. More than nine in ten respondents identified cost as a challenge, while a similar proportion reported limited availability and lack of information. These findings support earlier Nigerian qualitative evidence showing that misconceptions, misinformation and difficulties accessing appropriate EC can contribute to non-use or use of inappropriate alternatives.^{13,20} They also fit the broader sub-Saharan African evidence that high awareness does not necessarily translate into utilization when social and structural barriers persist.⁴

Fear of stigma or judgement was reported by 58.0% of respondents and remained independently associated with lower odds of EC use. This is consistent with evidence that social norms surrounding premarital sexuality can influence contraceptive decision-making among young women.^{13,21} The association observed in this study should, however, be interpreted as a relationship rather than proof of causation because the cross-sectional design does not establish temporal sequence.

Marital status was the strongest demographic factor associated with use in the adjusted model. Married respondents had approximately tenfold higher odds of reporting EC use than respondents who were not married. This finding may reflect the social acceptability of contraceptive use within marriage and the reduced stigma attached to sexual activity among married women. Similar associations between marital status and EC practice have been reported in university populations elsewhere in Africa.⁶ Because only 36 respondents were married, the relatively wide confidence interval around the adjusted odds ratio indicates some imprecision and warrants cautious interpretation. Conversely, structural barriers such as high cost, lack of availability, fear of stigma, and insufficient information independently reduced the likelihood of EC use.

Taken together, the findings suggest that the principal challenge in this population is not simply lack of awareness but the conversion of awareness into accessible and acceptable use. University-based interventions should therefore go beyond awareness campaigns. They should provide accurate information about the timing, effectiveness and safety of EC; improve access to affordable EC through appropriate campus or nearby services; and ensure that services are confidential and non-judgmental. WHO recommends that EC be integrated into family-planning programmes and that women and girls at risk of unintended pregnancy have access to EC.^{1,2}

Strengths and Limitations

Strengths

This study provides context-specific evidence on emergency contraceptive use among undergraduates in Abakaliki, a setting with limited recent data. The inclusion of multivariate analysis strengthens the findings by identifying independent predictors of EC utilization while controlling for confounders. Additionally, assessing barriers alongside prevalence and patterns offers a comprehensive understanding of factors influencing EC use, which is valuable for programmatic planning and policy formulation.

Limitations

The cross-sectional design limits causal inference between identified predictors and emergency contraceptive use. Data were self-reported and may be subject to recall bias and social desirability bias, particularly given the sensitive nature of sexual and reproductive health topics. Furthermore, the study was conducted in two tertiary institutions, which may limit the generalizability of findings to other undergraduate populations in Nigeria or similar settings.

Conclusion

Awareness of emergency contraception was high among female medical students in the two universities studied, but ever-use was substantially lower. Oral emergency contraceptive pills were the predominant method and most users reported taking EC within 24 hours of intercourse. Cost, limited availability, inadequate information and stigma were prominent barriers, while marital status was independently associated with utilization. University reproductive health programmes should therefore move beyond awareness alone and address affordability, availability, accurate information and confidentiality to improve access to EC.

Recommendations

Universities and relevant health-service providers should strengthen structured, evidence-based EC education within medical and general student health programmes; ensure confidential and youth-friendly access to EC through campus health services and appropriate pharmacy channels; address cost and

stock-availability barriers; and incorporate stigma-reduction and accurate counselling on EC timing, effectiveness, safety and available methods. Future multicentre studies should include non-medical students and, where feasible, prospectively assess EC use following episodes of unprotected intercourse.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Health Research and Ethics Committee of Alex Ekwueme Federal University Teaching Hospital, Abakaliki (Ref: AE-FUTHA/REC/VOL3/2025/488). Written informed consent was obtained from each participant before enrolment.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

Nnamdi Emmanuel Ede conceptualized the study. Nnamdi Emmanuel Ede, Raphael Ugochukwu Chikezie and Ngozi Mgbahara Eke designed the methodology. Nnamdi Emmanuel Ede, Kelvin Tochukwu Nwagu, Ngozi Mgbahara Eke, Gideon Uchenna Okeye, Amuchechukwu Veronica Nwafor, Chiamaka Rita Agha-Okoro and Ifeoma Cecilia Uche-Omovoh supervised data collection and analysis. Okechukwu Victor John and Silas Alegu Nwali drafted the initial manuscript. All authors reviewed and approved the final version for submission.

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Availability of data and materials

The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

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