

Beliefs About Protection Against Sexually Transmitted Infections Attributed to Emergency Contraception Among University Students

Jorge Rafael Figueroa Morales¹, Isaac Espinosa Santana¹, Tomás Mario Ávalos Ruvalcaba¹, Ana Laura Montero Zamudio¹, J. Ascención Montalvo González²

¹Master of Science, Autonomous University of Nayarit, Tepic, Nayarit, Mexico.

²Doctor of Chemistry, Autonomous University of Nayarit, Tepic, Nayarit, Mexico.

ABSTRACT:

Objective: To describe beliefs about protection against sexually transmitted infections (STIs) attributed to oral emergency contraception among university students.

Methods: An observational, cross-sectional, descriptive study included 377 records from a survey conducted in 2025. Responses to a question about protection against STIs, sources of information on contraceptive methods, and demographic characteristics were analyzed. Absolute frequencies and percentages were calculated without hypothesis testing.

Results: Participants included 254 women (67.4%) and 123 men (32.6%). A total of 264 students (70.0%) selected the response indicating no protection against STIs; 113 (30.0%) attributed some protection to the medication. The most frequent misconception was that it protects against vaginal infections (70; 18.6%). The internet was the most frequently reported information source (233; 61.8%), followed by school (92; 24.4%). Among those reporting the internet, 76 (32.6%) selected a response attributing protection against infections.

Conclusions: Three in ten participants attributed protection against infections to emergency contraception. The findings support proposing educational content that distinguishes pregnancy prevention from STI prevention. They do not establish sexual behaviors or causal effects of information sources.

KEYWORDS: emergency contraception, health education, sexually transmitted infections, beliefs, university students.

INTRODUCTION

Oral emergency contraception is an option for preventing pregnancy after unprotected sexual intercourse or contraceptive failure. Its action primarily involves inhibiting or delaying ovulation, rather than interrupting an established pregnancy. This purpose should be explained clearly to prevent effects beyond contraception from being attributed to the medication. (1)

Pregnancy prevention and the prevention of sexually transmitted infections (STIs) require distinct messages within sexuality education. The World Health Organization emphasizes that condoms are the contraceptive method that also offers protection against STIs. The Centers for Disease Control and Prevention (CDC) explicitly state that emergency contraception does not protect against these infections, including human immunodeficiency virus (HIV). Understanding this limitation is necessary to recognize the scope of the medication. (2,3)

Terminology also influences how preventive messages are understood. STIs encompass different infections and should not be reduced to HIV; likewise, vaginal discomfort or infection does not necessarily indicate an infection acquired through sexual contact. Clinical guidelines distinguish conditions with different transmission mechanisms and assessment requirements. This distinction is relevant when questionnaires combine terms such as AIDS, STIs, and vaginal infections. (4)

Contraceptive counseling should support informed decisions, consider individual needs, and avoid unnecessary barriers to access. From this perspective, identifying a misconception does not justify stigmatizing people who request emergency contraception. Its value lies in recognizing which information needs clearer explanation and how contraceptive counseling can be complemented with infection prevention. (5)

University research has documented heterogeneous knowledge. In Tamil Nadu, India, Davis and colleagues found that only some students had heard of emergency contraception and that misconceptions persisted among those familiar with it. Among nursing students in Seville, Leon-Larios and colleagues observed familiarity with the pill alongside gaps concerning its mechanism of action,

available types, and effectiveness. These findings show that having heard of the method does not imply a full understanding of its scope. (6,7)

Among first-year students in Thailand, Yongpradern and colleagues described moderate knowledge and differences across the aspects assessed. Research by Blake and colleagues among pharmacy students also examined specific content concerning indications, availability, and mechanisms of action. It is therefore useful to distinguish general knowledge, responses to specific questions, and patterns of use, rather than treating these dimensions as equivalent. (8,9)

Recent studies by Ibrahim and colleagues in Ghana, Acen and colleagues in Uganda, and Abewa and colleagues in Ethiopia examined knowledge and use of emergency contraception in student populations. Differences in instruments, classification criteria, and sample characteristics require interpretation within each context. These studies provide background for examining educational needs, although their overall knowledge percentages cannot be compared directly with a single question about STIs. (10-12)

The study of university sexual health can encompass knowledge of infections and understanding of health information. Dorji and colleagues assessed knowledge of both STIs and contraception among students in Bhutan. Sons and Eckhardt identified gaps in reproductive knowledge among US university students and examined its relationship with health literacy. Both approaches support exploring students' understanding of preventive messages without assuming that their educational attainment guarantees sufficient comprehension. (13,14)

Digital information sources are another area of interest. Fowler and colleagues analyzed sexuality education content on TikTok and described the diversity of topics addressed. Their study raises the need to investigate content accuracy and effects; it does not justify considering all digital information reliable or incorrect. In a survey, recording the internet as a source provides only an initial description and does not establish the quality of the information received. (15)

In this context, the dataset of students from Universidad Autónoma de Nayarit allows examination of four responses concerning protection attributed to the emergency contraceptive pill. Describing them separately and by information source may inform specific educational content. This study focuses on beliefs expressed in the questionnaire; it does not assess clinical effectiveness, the presence of infections, or unrecorded sexual practices.

Research question and objectives

Research question. What beliefs do the participating university students hold about the protection emergency contraception provides against STIs?

General objective. To describe beliefs about protection against STIs attributed to emergency contraception among the participating university students.

Specific objectives. To identify the proportion of participants recognizing the absence of protection against STIs; describe misconceptions expressed through the questionnaire response options; and present the distribution of responses by source of information on contraceptive methods.

MATERIALS AND METHODS

Design and study setting

A quantitative, observational, cross-sectional, descriptive study was conducted using 377 records from an anonymous survey administered between August and November 2025 among students at Universidad Autónoma de Nayarit, selected through nonprobability convenience sampling. This study uses the same survey as "Patrón de consumo, conocimiento y automedicación de anticoncepción oral de emergencia en estudiantes universitarios" [Pattern of consumption, knowledge and self-medication of emergency oral contraception in university students], with a focus on beliefs about protection against infections. Data were collected using a structured multiple-choice questionnaire without collecting personally identifying information.

The inclusion criterion was enrollment as a student at Universidad Autónoma de Nayarit. Eligibility was not restricted by gender or previous personal use of emergency contraception. All 377 available records with a response to the main question were included. No missing values were identified in the analyzed variables.

Variables and operational definitions

The main variable, PrevInfeccionITS, was a closed-ended, single-response question with four options. Its original categories were retained. Option 3 was classified as recognizing the absence of protection; options 1, 2, and 4 were grouped as attributing some

protection against infections. This grouping describes a questionnaire response and is not a validated scale of overall knowledge.

Age, gender, and information source were also included. The information-source question concerns contraceptive methods in general. Age is coded in categories from 18 to 24 years and an open-ended category above 24; it was therefore described categorically, and an exact mean was not calculated. References to ‘AIDS’ and ‘vaginal infections’ were retained when presenting the original options, without equating HIV with AIDS or treating every vaginal infection as an STI.

Data analysis and ethical considerations

Records and value labels were read using Python and pyreadstat, and frequencies and cross-tabulations were calculated. Overall percentages use 377 as the denominator, while source-specific percentages use the total for each source category. Percentages were rounded to one decimal place. No regression models, significance tests, or causal estimates were applied. Findings are restricted to the available sample.

Participation was voluntary, and participants received information about the purpose of the study. The survey was anonymous and did not collect personally identifying information. Responses were handled confidentially, and results are reported only in aggregate.

RESULTS

A total of 377 complete records were analyzed. Age 19 years was the most frequent category (103; 27.3%), followed by age 20 years (80; 21.2%). Women accounted for 67.4% of the sample. Participant characteristics are summarized in Table 1.

Table 1. Participant characteristics.

Characteristic	n	%
Gender: women	254	67.4
Gender: men	123	32.6
Age: 18 years	32	8.5
Age: 19 years	103	27.3
Age: 20 years	80	21.2
Age: 21 years	46	12.2
Age: 22 years	36	9.5
Age: 23 years	22	5.8
Age: 24 years	22	5.8
Age: over 24 years	36	9.5

Source: study survey data. Each distribution uses N = 377.

A total of 264 participants (70.0%) recognized the absence of protection against STIs. The remaining 113 (30.0%) selected an option attributing protection. The most frequent incorrect response concerned vaginal infections: 70 participants, representing 18.6% of the full sample and 61.9% of the 113 incorrect responses. The distribution of responses is presented in Table 2.

Table 2. Protection attributed to the emergency contraceptive pill.

Questionnaire option (abbreviated)	n	%
Protects against AIDS, but not other STIs	8	2.1
Does not protect against AIDS, but protects against other STIs	35	9.3
Does not protect against AIDS or other STIs	264	70.0
Protects only against vaginal infections	70	18.6
Total	377	100.0

Source: study survey data, item PrevInfeccionITS. Instrument terminology is retained; response labels do not describe clinical effectiveness.

Results by information source

The internet was the most frequently reported source (233; 61.8%), followed by school (92; 24.4%), family (24; 6.4%), friends (15; 4.0%), a healthcare professional (11; 2.9%), and television (2; 0.5%). Table 3 presents responses about protection by information source.

Table 3. Responses about protection by information source.

Source	Total	Recognizes no protection, n (%)	Attributes some protection, n (%)
Internet	233	157 (67.4)	76 (32.6)
School	92	69 (75.0)	23 (25.0)
Family	24	17 (70.8)	7 (29.2)
Friends	15	11 (73.3)	4 (26.7)
Healthcare professional	11	9 (81.8)	2 (18.2)
Television	2	1 (50.0)	1 (50.0)
Total	377	264 (70.0)	113 (30.0)

Source: study survey data, cross-tabulation of FuentedeInformacion and PrevInfeccionITS. Percentages are calculated within each row.

Among participants reporting the internet, 76 attributed some protection against infections (32.6%); among those reporting school, 23 did so (25.0%). These differences are descriptive. The television and healthcare-professional groups contain few participants, so their percentages should not be interpreted as a ranking of source quality. Figure 1 summarizes the three misconceptions as percentages of the full sample.

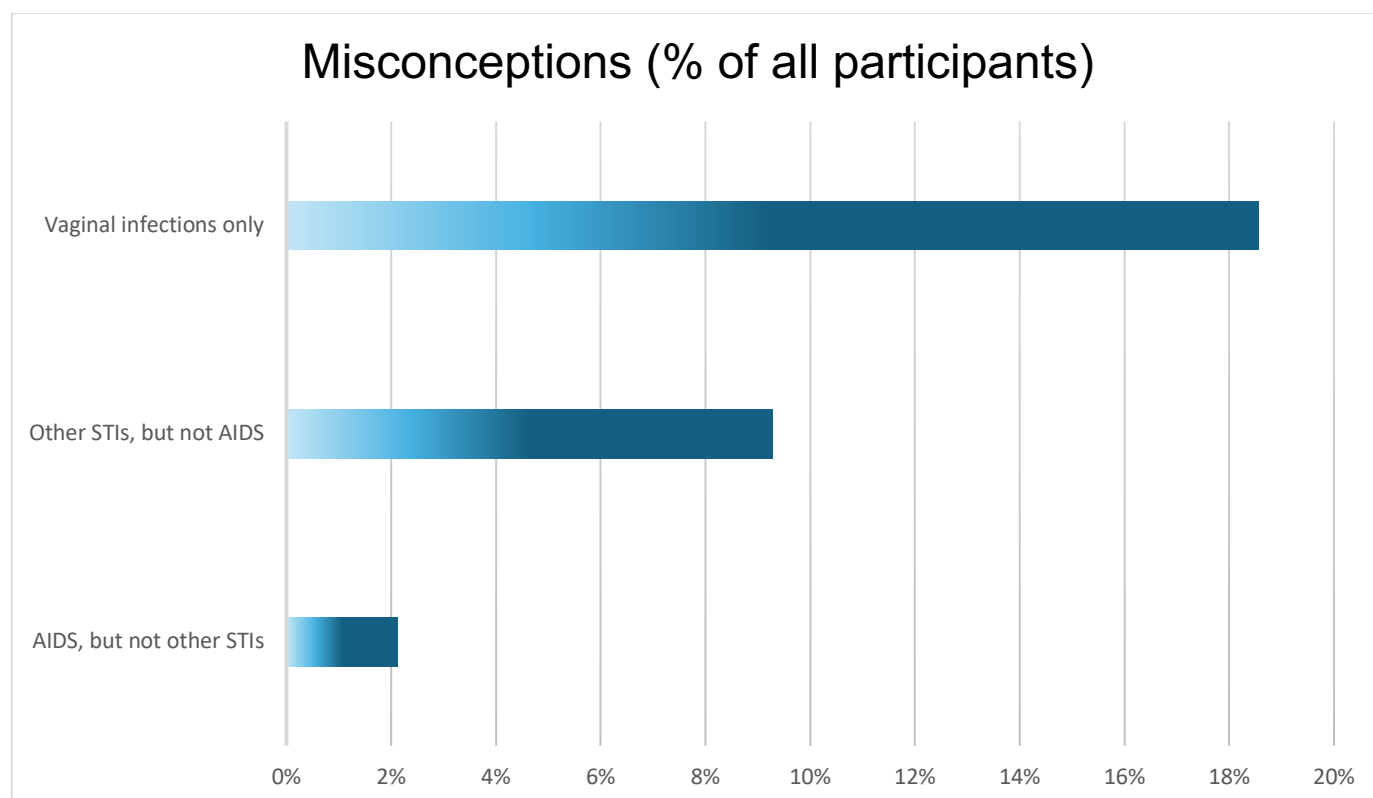


Figure 1. Misconceptions about protection attributed to the method.

The three categories comprise 113 participants (30.0%). Questionnaire labels are abbreviated.

DISCUSSION

Interpretation of the main finding

The central finding was that 113 of the 377 participants, or 30.0%, attributed some protection against infections to emergency contraception. Most recognized the absence of protection, but the proportion of incorrect responses identifies a specific educational topic. The value of this finding lies in clarifying the function students assign to the medication, rather than classifying them globally as informed or uninformed. This distinction is consistent with clinical guidance separating emergency contraception from STI prevention. (2,3)

A correct response to the item does not demonstrate that a person uses condoms, seeks diagnostic testing, or understands all contraceptive methods. Similarly, an incorrect answer does not establish risky sexual behavior. Dorji and colleagues measured knowledge and practices separately, while Sons and Eckhardt examined different dimensions of reproductive understanding. This methodological separation helps define the interpretation of our finding: a response to specific content was observed, not a preventive behavior. (13,14)

Comparison with university studies

The study by Davis and colleagues provides a comparison close to the content assessed: among 183 students who had heard of emergency contraception, 116 (63.4%) recognized that it does not prevent sexually transmitted diseases. Recognition in the present sample was 70.0%. This numerical difference does not establish greater knowledge among students in Nayarit because the denominators, participant selection, and wording of the instruments differ. The relevant commonality is that recognition of the limitation and misconceptions coexisted in both settings. (6)

In Seville, nursing students were familiar with the pill but retained gaps concerning aspects of its functioning. In Thailand, knowledge varied across topics, with difficulties concerning administration schedules and distinctions from regular contraception. These findings contextualize the partial nature of knowledge: a person may identify a medication's purpose while remaining uncertain about other effects. However, the cited studies did not measure exactly the same outcome and are used as conceptual comparisons rather than statistical equivalents. (7,8)

The studies by Ibrahim, Acen, and Abewa also demonstrate the value of considering knowledge and use separately. For example, Abewa and colleagues reported 46.2% adequate knowledge under their own classification; this percentage is not equivalent to the 70.0% correct response to our item. Similarly, knowing the administration timeframe, as assessed in Uganda, addresses a different dimension. Avoiding these equivalences prevents erroneous conclusions that one population knows more or less about the method based solely on different indicators. (10-12)

The belief concerning vaginal infections

Attributing protection against vaginal infections was the most frequent incorrect response: 70 participants, representing 18.6% of the total and 61.9% of those selecting an incorrect option. This breakdown provides guidance that would be lost by reporting only the overall 30.0%. One possible interpretation is that some participants associate an intervention following sexual intercourse with broader genital protection. However, the survey did not explore the reasoning behind their answers and cannot confirm this explanation.

The effect of wording also requires consideration. The category 'vaginal infections' encompasses diverse conditions, and the original options use 'AIDS' where a current prevention question should distinguish HIV and STIs. Treatment guidelines differentiate the causes of vaginal symptoms and their modes of transmission. Teaching should therefore clarify the categories used while explaining that the pill has no preventive role against these infections. A future version of the instrument could separate these concepts and include a 'do not know' option. (3,4)

Information sources and educational opportunities

The internet accounted for 233 responses (61.8%), followed by school with 92 (24.4%). Among those reporting the internet, 76 attributed some protection against infections (32.6%); among those reporting school, 23 did so (25.0%). These figures describe the distribution of responses and cannot establish that a source produces or prevents misconceptions. Moreover, the question concerns contraceptive methods in general rather than the emergency pill alone, a limitation that must be retained when interpreting the cross-tabulations.

The study by Fowler and colleagues is relevant to this interpretation: content concerning anatomy, contraception, and other sexual health topics can circulate within a single platform. The label 'internet' is therefore too broad to infer the quality, authorship, or relevance of a message. One practical application of our findings would be to select brief institutional resources and facilitate access through channels used by students. This proposal requires local evaluation; the predominance of the internet identifies only a potential communication channel. (15)

Obtaining medication and obtaining information are not equivalent. Gbagbo studied over-the-counter emergency contraception among university students in Ghana using questionnaires and qualitative components, a design that explores experiences beyond a measure of consumption. Our study lacks that depth for explaining beliefs. It would be useful to add questions about who explained the medication's scope, which message was remembered, and whether respondents had an opportunity to resolve questions. (16)

Healthcare professionals were reported as an information source by 11 participants, two of whom attributed some protection against infections. The small group size prevents this from being considered a stable estimate of counseling quality. Nor does it mean that the other 366 participants never received professional information: the variable records one reported source rather than their entire information history. Schools may offer opportunities for accessible guidance, but these descriptive results do not demonstrate the effectiveness of a particular educational program.

From findings to an intervention proposal

Harper and colleagues evaluated an educational intervention on emergency contraception options among adolescents and young adults and documented improvements in knowledge. This supports the possibility of using brief visual explanations, although it does not establish that the same format would produce identical results in Nayarit. Based on the beliefs described here, an activity could focus on recognizing the pill's purpose, distinguishing it from STI prevention, and addressing confusion about vaginal infections. (17)

Digital evidence requires caution when moving from learning to behavior. In the trial by Wong and colleagues involving 781 female university students, the web intervention did not significantly increase consistent condom use compared with an informational webpage, although it temporarily improved indicators of knowledge, attitudes, norms, and self-efficacy. In the trial by McCrimmon and colleagues involving 457 adolescents, HEART improved HIV/STI knowledge and other immediate outcomes. Both studies support evaluating specific outcomes without promising a reduction in infections following an informational session. (18,19)

A subsequent evaluation could therefore distinguish three levels: immediate recognition of information, retention of learning, and behavioral changes measured through appropriate questions. The present study provides only an initial description. A workshop could use hypothetical situations and an open-ended question asking each student to explain what protection they expect from the medication. Responses could indicate understanding, while conclusions about preventive practices would require follow-up and additional measurements. This distinction avoids equating satisfaction with an activity, learning, and clinical protection. (17-19)

The preparation of those providing guidance also deserves attention. Blake and colleagues assessed specific knowledge among pharmacy students; in Poland, Czekajewska and colleagues found gaps among both students and pharmacists despite differences between the groups. These contexts differ from Mexico, but they support reviewing the content and clarity of messages provided. A proposal for the university would be to ensure consistent, understandable, and respectful explanations without assuming that professional affiliation alone guarantees adequate communication. (9,20)

Educational use of these findings should preserve students' autonomy. The proportion of incorrect responses does not justify restricting access to the medication or attributing irresponsibility to its users. Contraceptive practice recommendations prioritize person-centered care and the removal of unnecessary barriers. Within this framework, the results can guide specific questions and explanations, accompanied by relevant preventive information and opportunities for consultation, rather than becoming a judgment about personal decisions. (5)

Study limitations and contribution

Convenience sampling prevents generalization of these percentages to the entire university. A single forced-choice question does not measure the depth, certainty, or stability of a belief, nor distinguish lack of knowledge from terminological confusion. Information-source categories do not identify exposure frequency, quality, or temporal sequence. Small groups and the absence of

inferential tests restrict comparisons to description. The survey also refers to partner use, so all participants should not be considered direct users of emergency contraception.

The contribution is to identify the content of responses and a specific topic for university education. The data come from the same survey as the earlier manuscript, so the distinctive scope is the breakdown of beliefs and their educational interpretation. Further work could revise the item's wording, assess comprehension in a pilot study, and evaluate knowledge and practices separately. Existing research supports exploring these components, but the relevance and effectiveness of any intervention must be assessed locally. (7,8,17-19)

CONCLUSION

In this sample of 377 students, 264 (70.0%) recognized that emergency contraception does not protect against STIs, and 113 (30.0%) attributed some protection against infections. The most frequent misconception was protection against vaginal infections, expressed by 70 participants. These findings identify a specific misunderstanding and do not classify overall knowledge or allow sexual behaviors to be inferred.

The predominance of the internet and the role of schools as information sources make both settings relevant to potential educational activities. The proposed guidance should distinguish pregnancy prevention from STI prevention, explain the pill's limitations, and use clear terminology, consistent with WHO and CDC recommendations. This educational implication is supported by clinical sources; the distribution of beliefs comes from the dataset studied. (1-5)

A subsequent intervention must evaluate its own effect on understanding and, where appropriate, on independently measured behaviors. Available educational studies support the possibility of improving knowledge but show that this does not guarantee behavioral change. Thus, the present study provides a description for planning activities without demonstrating intervention effectiveness or a reduction in infection risk. (17-19)

REFERENCES

1. World Health Organization. Emergency contraception [Internet]. Geneva: WHO; 2021 Nov 9 [cited 2026 Sep 7]. Available from: <https://www.who.int/news-room/fact-sheets/detail/emergency-contraception>
2. World Health Organization. Family planning/contraception methods [Internet]. Geneva: WHO; 2025 Jul 3 [cited 2026 Sep 7]. Available from: <https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception>
3. Centers for Disease Control and Prevention. Emergency contraception [Internet]. Atlanta: CDC; 2024 Nov 19 [cited 2026 Sep 7]. Available from: <https://www.cdc.gov/contraception/hcp/usspr/emergency-contraception.html>
4. Workowski KA, Bachmann LH, Chan PA, Johnston CM, Muzny CA, Park I, et al. Sexually transmitted infections treatment guidelines, 2021. *MMWR Recomm Rep*. 2021;70(4):1-187. doi:10.15585/mmwr.rr7004a1.
5. Curtis KM, Nguyen AT, Tepper NK, Zapata LB, Snyder EM, Hatfield-Timajchy K, et al. U.S. Selected Practice Recommendations for Contraceptive Use, 2024. *MMWR Recomm Rep*. 2024;73(3):1-77. doi:10.15585/mmwr.rr7303a1.
6. Davis P, Sarasveni M, Krishnan J, Bhat LD, Kodali NK. Knowledge and attitudes about the use of emergency contraception among college students in Tamil Nadu, India. *J Egypt Public Health Assoc*. 2020;95(1):1. doi:10.1186/s42506-019-0030-9.
7. Leon-Larios F, Ruiz-Ferron C, Jalon-Neira RM, Praena-Fernández JM. Nursing students' knowledge, awareness, and experiences of emergency contraception pills' use. *J Clin Med*. 2022;11(2):418. doi:10.3390/jcm11020418.
8. Yongpradern S, Uitrakul S, Daengnapapornkul P, O-in R, Sinsangbun B. Knowledge and attitude toward emergency contraceptive pills among first-year undergraduate students in Southern Thailand. *BMC Med Educ*. 2022;22(1):593. doi:10.1186/s12909-022-03659-2.
9. Blake BN, Bookbinder S, Lazenby G, Marshall A, Weed E, Meglin M. Knowledge of oral emergency contraception among pharmacy students. *Womens Health Rep (New Rochelle)*. 2024;5(1):40-45. doi:10.1089/whr.2023.0175.
10. Ibrahim N, Kim SS, Lomotey AY, Merdiamah GE, Ato-Brewoo A. Knowledge and use of emergency contraception among female college students in Ghana. *Nurs Womens Health*. 2025;29(2):120-128. doi:10.1016/j.nwh.2024.09.002.
11. Acen BK, Obonyo I, Ocen T, Arebo B, Auma AG, Beja H. Knowledge and practices of emergency contraception use and associated factors among female undergraduate students in Northern Uganda: a cross-sectional study. *Womens Health (Lond)*. 2025;21:17455057251321204. doi:10.1177/17455057251321204.

12. Abewa T, Addis A, Asmamaw DB, Asmare L, Alemu T, Bayou FD. Knowledge and use of emergency contraceptive methods and associated factors among female youth college students in Gondar city, Northwest Ethiopia, 2023. BMC Womens Health. 2024;24(1):570. doi:10.1186/s12905-024-03413-4.
13. Dorji T, Wangmo K, Tshering D, Tashi U, Wangdi K. Knowledge and attitude on sexually transmitted infections and contraceptive use among university students in Bhutan. PLoS One. 2022;17(8):e0272507. doi:10.1371/journal.pone.0272507.
14. Sons A, Eckhardt AL. Health literacy and knowledge of female reproduction in undergraduate students. J Am Coll Health. 2023;71(3):836-843. doi:10.1080/07448481.2021.1909034.
15. Fowler LR, Schoen L, Smith HS, Morain SR. Sex education on TikTok: a content analysis of themes. Health Promot Pract. 2022;23(5):739-742. doi:10.1177/15248399211031536.
16. Gbagbo FY. Over-the-counter procured emergency contraception among undergraduate students in a public University in Ghana. Contracept Reprod Med. 2024;9(1):66. doi:10.1186/s40834-024-00327-2.
17. Harper CC, Jones E, Brindis CD, Watson A, Schroeder R, Boyer CB, et al. Educational intervention among adolescents and young adults on emergency contraception options. J Adolesc Health. 2023;72(6):993-996. doi:10.1016/j.jadohealth.2023.01.007.
18. Wong JYH, Zhang W, Wu Y, Choi EPH, Lo HHM, Wong W, et al. An interactive web-based sexual health literacy program for safe sex practice for female Chinese university students: multicenter randomized controlled trial. J Med Internet Res. 2021;23(3):e22564. doi:10.2196/22564.
19. McCrimmon J, Widman L, Javidi H, Brasileiro J, Hurst J. Evaluation of a brief online sexual health program for adolescents: a randomized controlled trial. Health Promot Pract. 2024;25(4):689-697. doi:10.1177/15248399231162379.
20. Czekajewska J, Walkowiak D, Jelińska A, Domaradzki J. Knowledge and attitudes toward emergency contraception among pharmacy students and community pharmacists in Poland. Front Public Health. 2026;14:1763478. doi:10.3389/fpubh.2026.1763478.

Cite this Article: Figueroa Morales, J.R., Santana, I.E., Ávalos Ruvalcaba, T.M., Montero Zamudio, A.L., Montalvo González, J.A. (2026). Beliefs About Protection Against Sexually Transmitted Infections Attributed to Emergency Contraception Among University Students. International Journal of Current Science Research and Review, 9(10), pp. 5240-5247. DOI: <https://doi.org/10.47191/ijcsrr/V9-i10-01>