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Original research

Gender differences in high-risk modifiable sexual practices: insights from a student population

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ABSTRACT

Introduction: Sexually transmitted infections (STIs) are on the rise, particularly in vulnerable groups with limited sexual education and healthcare access. In Mexico, high rates of STIs underscore the need for effective public health strategies and sexual education. **Objective:** Investigate gender differences in high-risk sexual practices among students aged 18-25 in a private University in Mexico City, focusing on modifiable behavioral risk factors for STIs. **Materials and Methods:** This research performed a cross-sectional observational design, surveying students from a private university. A z-score test was performed, with a 95% confidence interval and a 5% error. **Results:** A difference of 30% (95% CI, p=0.003) between the male and female participants that received health education was identified (80% female vs 50% males). A difference of 25% (95% CI, p=0.0122) between females and males (67.5% females vs 42.5% males), reported discussing STI status before sexual activities. Regarding the use of barrier methods, a difference of 25% (95% CI, p=0.0122), (70% females vs 45% males) reported the consistent use of such methods. **Conclusion:** These findings underscore the urgent need for targeted sexual health education, particularly for men, to address the substantial knowledge gaps and risky behaviors. Comprehensive and accessible education programs, coupled with community engagement and policy support, are critical to fostering a culture of sexual health responsibility among young adults.

Key words: sexually transmitted infections; sexual education; gender; prevention; sexual protection.

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RESUMEN

Introducción: las infecciones de transmisión sexual (ITS) son mayores en grupos con educación sexual y atención médica limitadas. En México, las altas tasas de ITS demuestran la necesidad de mejores estrategias de salud pública y educación sexual. **Objetivo:** investigar las diferencias de género en prácticas sexuales de alto riesgo, entre estudiantes de 18 a 25 años de una universidad privada de la Ciudad de México, enfocándose en factores de riesgo conductuales modificables para ITS. **Materiales y métodos:** la investigación fue realizada mediante un diseño observacional transversal, se encuestaron a estudiantes de una universidad privada. Se realizó una prueba de puntuación z, con un intervalo de confianza del 95% y un margen de error del 5%. **Resultados:** se identificó una diferencia del 30% (IC 95%, p=0,003) entre los participantes masculinos y femeninos que recibieron educación sexual, el 80% de las mujeres recibieron educación sexual mientras que el 50% de los hombres la recibieron. Se identificó una diferencia del 25% (IC 95%, p=0,0122), donde el 67,5% de las mujeres indicaron discutir el estado de las ITS antes de las actividades sexuales, comparado con el 42,5% de los hombres que indicaron hacer lo mismo. En cuanto al uso de métodos de barrera, se identificó una diferencia del 25% (IC 95%, p=0,0122), donde el 70% de las mujeres afirmaron utilizar siempre protección, mientras que el 45% de los hombres indicaron lo mismo. **Conclusiones:** estos hallazgos resaltan la necesidad de brindar educación sexual específica, especialmente a los hombres. Abordar las lagunas de conocimiento y los comportamientos de riesgo. Los programas educativos integrales y accesibles, junto con la participación comunitaria y el apoyo político, son esenciales para promover una cultura de responsabilidad en materia de salud sexual entre los jóvenes.

Palabras clave: infecciones de transmisión sexual; educación sexual; género; prevención; protección sexual.

INTRODUCTION

Sexually transmitted infections (STI) are defined as a group of diseases acquired by sexual contact (skin-to-skin, oral, vaginal or anal) caused by bacteria, parasites, viruses or fungi.[1] The Center for Disease Control and Prevention (CDC) has studied epidemiologic behavior of STIs for the last ten years, with an increasing incidence and prevalence of STIs, especially in vulnerable groups that have limited sexual education, low income and non-accessible health services.[2] Currently, STIs are a threat to public health, short and long-term complications have a serious impact on patients quality of life and an economic burden to healthcare systems.[3] The World Health Organization estimates that 1 million STIs are acquired every day, for 2020, there was a world incidence of 374 million infections, being the most common chlamydia, gonorrhea, syphilis and trichomoniasis. Genital herpes, VPH and Hepatitis B are also among the most common STIs.[4]

In the context of STIs, key risk factors include early initiation of sexual activity, engaging with multiple sexual partners, co-infection with other STIs, and facing both biological and social challenges. The absence or inconsistent use of contraception, particularly condoms, significantly elevates the risks associated with STIs. Substance abuse can precipitate unprotected sexual encounters, while coercive sexual experiences can also play a pivotal role. Limited access to comprehensive sexual education and healthcare services, coupled with social determinants such as socioeconomic status and education level, further exacerbates the issue. According to the World Health Organization's 2006 definition, sexual health is defined as a state of physical, emotional, mental, and social well-being in relation to sexuality.

In this context, risk factors have been identified that include early initiation of sexual activity, engaging in sexual relations with multiple partners, being co-infected with other STIs, and encountering both biological and social challenges. Furthermore, the absence or inconsistent use of contraception, particularly condoms, can serve to elevate these risks. Substance abuse may lead to unprotected sexual encounters, while coercive sexual experiences can also play a role. Additionally, limited access to comprehensive sexual education and healthcare services, as well as societal determinants like socioeconomic status and education level, contribute to this phenomenon.[5] In accordance with the World Health Organization's 2006 definition, sexual health can be defined as a state of comprehensive well-being across the physical, emotional, mental and social dimensions in relation to sexuality.[6]

The elevated risk of contracting STIs among teenagers is attributable to both their behavioral proclivities and biological characteristics.[7] The CDC indicates that young individuals are more susceptible to contracting STIs for a variety of

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reasons. From a behavioral perspective, many of them engage in high-risk sexual activities, such as having multiple partners, which serves to further increase their vulnerability.[8] Furthermore, not all individuals pursue recommended STI screenings, and many find the process of discussing their sexual history with healthcare professionals to be challenging. These factors collectively highlight the heightened susceptibility of young people to STIs in comparison to adults.

Mexico is confronted with the challenge of managing a diverse range of STIs, with a particularly high incidence of infections such as chlamydia, gonorrhoea, syphilis and human papillomavirus (HPV).[9] In Mexico, the overall prevalence of Chlamydia ranges from 1.1% to 31%, with an average of 14.4%. Of particular concern is the prevalence of gonorrhea among high-risk groups, such as sex workers. The prevalence of syphilis in the general population is estimated to be between 0.1% and 1.5%. HPV affects up to 31% of women and 43% of men.[10] The implications of these infections extend beyond individual health, impacting the broader healthcare infrastructure and underscoring the need for comprehensive strategies to tackle their proliferation.[11,12]

The available evidence suggests that there are significant differences in the way that sexual and reproductive health education is provided to males and females, which are shaped by cultural norms and societal expectations.[13] It is common practice to provide girls with education that is focused on menstruation and pregnancy prevention, whereas boys are more likely to learn about sexually transmitted diseases. These discrepancies are indicative of traditional gender roles and sexual behavior expectations.[14]

HYPOTHESIS

A greater propensity for engaging in high-risk behavior is observed among male students aged 18-25 in comparison to their female counterparts.

OBJECTIVE

The objective of this study is to analyze and compare the modifiable behavioral risk factors leading to STIs in male and female students aged 18-25, with a view to highlighting any gender-specific differences and commonalities.

MATERIAL AND METHODS

Study design and sample size

A cross-sectional observational study was conducted at Universidad Anahuac México Norte, targeting a population of university students, with the objective of identifying risk factors associated with the contraction of STIs. The study population comprised currently enrolled students, aged between 18 and 25 years, who were either male (n = 40) or female (n = 40), and who were sexually active and had provided informed consent to participate in the study. The study excluded students who did not consent to participate, were not sexually active, were under the age of 18 or over 25 years of age.

The data were collected over a period of three months. Participation was entirely voluntary, and respondents were guaranteed anonymity. The survey was conducted online via a secure platform to facilitate a broad reach and ensure the confidentiality of respondents' identities.

As this was an exploratory study, the sample size was determined by the feasibility of recruitment using convenience sampling. A sample of 80 students (40 per group) was established. This sample size is sufficient to detect an effect size of 0.1 or larger.

Evaluation of the reliability of questionnaire

The survey instrument comprised a series of questions designed to elicit data on sexual habits and the level of education regarding contraceptive methods. The instrument was developed following an extensive review of the literature, a process of validation by professional experts, and a pilot test on a small cohort to ensure comprehensibility and relevance. The reliability of the questionnaires was evaluated using internal consistency measures, specifically Cronbach's alpha. All the questionnaires demonstrated a Cronbach's alpha value of 0.95 or above. The survey employed a series of closed-ended questions to facilitate the collection of quantitative data.

Ethical considerations

Prior to their participation in the study, all subjects provided electronic informed consent. The research was conducted

in accordance with the ethical standards set forth in the Declaration of Helsinki and the official Mexican Standard NOM-012-SSA3-2012. To ensure the anonymity of patients, a consecutive number was provided on confidential files.

RESULTS

The 80 volunteers included in the study had a mean age of 23, with an age range of 18 to 25 years. Of these volunteers, 40 (50%) were female and 40 (50%) were male. All 80 participants were sexually active. As illustrated in Table 1.

Table 1. General characteristics of the population studied. The table **displays the data divided into male and female subcategories and total students interviewed**

General population characteristics	Females	Males	Total
Total students interviewed	40	40	80
Mean Age	22.5	23.7	23.6
Sexually active	40	40	80

Positive sexual behaviors

The responses to the survey, which are also presented in Table 2, Figure 1, were obtained. About the question of whether they had received formal education on STIs and safe sexual practices, including the identification of various types of STIs and their modes of transmission, it was confirmed by 32 women (80%) and 20 men (50%) respectively that they had received such education.

Regarding the question of discussing a partner's STI status prior to engaging in sexual activity, 27 women out of 40 (67.5%) and 17 men out of 40 (42.5%) reported that they had indeed discussed the matter.

In terms of consistent condom or other barrier method use during sexual intercourse, 27 women (67.5%) and 17 men (42.5%) indicated that they always use protection.

Table 2. Question responses. Data obtained **in the survey, expressed in percentages, divided into females and males**

Questions	Received formal education about STIs	Use consistently condoms or barrier methods	Inadequate condom use	Discussing STIs before sexual activity	Had sexual activity without protection in long-term relationships	Used protection in oral sex or other types of sexual activity	Have had past diagnosed STIs	Had unprotected sexual intercourse with someone with multiple partners
Females (n=40)	80%	70%	15%	67.5%	62.5%	30%	12.5%	25%
Males (n=40)	50%	45%	55%	42.5%	60%	25%	15%	62.5%

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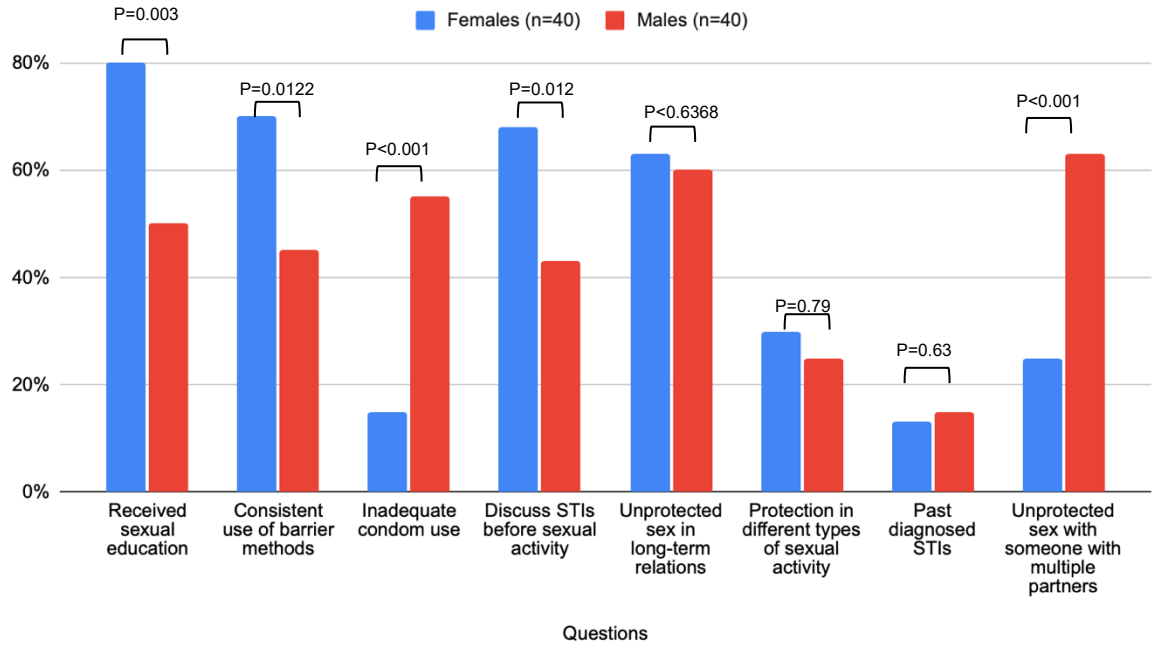

FIGURE 1. STD questionnaire answers in bar graph. The graph depicts the comparative frequencies of high-risk sexual behaviors and STI knowledge between male (red) and female (blue) college students, expressed in percentages.

High-risk sexual behaviors

In relation to inadequate condom use, such as storing condoms in locations that could expose them to extreme temperatures (e.g., car glove compartments, wallets), reusing condoms for multiple sexual encounters or use of expired or damaged condoms, 6 women (15%) and 22 men (55%) acknowledged doing so.

Concerning engaging in sexual activity without any form of protection due to being in a long-term relationship, 25 women (62.5%) and 24 men (60%) confirmed that they had engaged in such behavior.

In relation to the utilization of barrier methods (e.g. dental dams) during oral sex or barrier protection for specific types of sexual activity, 12 women (30%) and 10 men (25%) confirmed the use of such methods.

In relation to engaging in unprotected sexual intercourse with someone known to have multiple partners, 10 women (25%) and 25 men (62.5%) admitted to having engaged in such activity (Figure 1).

Past sexually transmitted infections

In terms of past diagnoses of STIs, among the 40 female respondents, five (12.5%) reported a previous diagnosis of an STD. Among the 40 male respondents, six (15%) also reported a previous diagnosis of an STD (Figure 1).

DISCUSSION

Following the analysis of the data collected from the college student cohort, the initial hypothesis was confirmed, revealing a clear trend. This indicated that males within the group exhibited riskier sexual behaviors more frequently than their female counterparts and possessed significantly less knowledge regarding the appropriate use of contraceptive methods.

About positive sexual behaviors, specifically sexual education, a statistically significant difference was observed between males and females, with a proportion of 30% (95% CI, p=0.003). The foundation of sexual health education

appeared to be significantly weaker among males. Only half of the male respondents reported receiving formal education on STIs and safe sexual practices, compared to 80% of females. This educational gap is likely to contribute to other risky behaviors observed in the survey. A lack of awareness of these issues can lead to delayed identification and treatment of STIs, which in turn can exacerbate health risks.

In the context of sexual activity, a notable discrepancy was observed in the discourse surrounding STIs. Specifically, 42.5% of male participants engaged in open dialogue about their partner's STI status prior to sexual intercourse, whereas 67.5% of female participants did so (95% CI, p=0.0122). This discrepancy suggests that women may be more inclined to proactively address sexual health risks with their partners. Notwithstanding these risky practices, there were areas where behaviors exhibited by the two genders were similar.

About the utilization of contraceptive methodologies, a discrepancy of 25% (95% CI, p=0.0122) was discerned in the deployment of protective measures between women (67.5%) and men (45.5%). This indicates that women are more likely to utilize protective measures during sexual intercourse than men. A 40% difference was identified in the analysis of high-risk sexual behavior, specifically inadequate condom use (95% CI, $p < 0.001$). Furthermore, the utilization of condoms is indicative of this proclivity towards risky behaviors. A greater proportion of men (55%) than women (15%) stored condoms in locations susceptible to extreme temperatures, such as glove compartments in vehicles or wallets. Such conditions can impair the integrity of the condom. Furthermore, the utilization of expired or compromised condoms was significantly more prevalent among male participants, which suggests a deficiency in knowledge or disregard for proper condom usage among the male respondents.

No statistically significant difference was identified between the two groups (95% CI, p=0.6368) about the utilization of contraceptive methods in long-term relationships. Both genders engage in unprotected sexual intercourse in this type of relationship.

No statistically significant difference was identified between males and females about the utilization of barrier methods across a range of sexual encounters (95% CI, p=0.7912).

The evidence indicates that men engage in a greater number of sexual encounters with multiple sexual partners than women (95% CI, $p < 0.001$).

It is noteworthy that practices that directly contribute to the higher incidence of STIs, such as not using a condom or misusing it, were observed among this group. A series of questions were posed to ascertain the number of women and men who had received sexual education, the prevalence of high-risk behavior, and the final question addressed the occurrence of past STIs. It is reasonable to conclude that the discrepancy in educational attainment is a significant contributing factor to the subsequent behavioral risks. The lower awareness of STI symptoms among males may result in a delay in the recognition and treatment of these infections, thereby prolonging the transmission risk to others. In contrast, female respondents demonstrated a high level of engagement with sexual education and a proactive approach to STI awareness. It is evident that males are engaging in sexual behaviors that are more likely to result in the transmission of STIs, which may be attributed to deficiencies in their knowledge and awareness of sexual health. Addressing these deficiencies in educational provision could facilitate more informed decision-making and safer sexual practices, which would ultimately serve to reduce the risks of STIs and unintended pregnancies. The following bar graph presents the percentage differences between males and females in a clear format.

A recent study conducted by Faludi and Rada[14] examined the gender-based disparities in sexual and reproductive health outcomes among young adults. The study revealed that women were more likely to engage in sexual health discussions than men. Furthermore, it was established that women had received consistent guidance from their families regarding the importance of cautious sexual activities and the adverse effects of unprotected sexual intercourse. However, male participants were less engaged in sexual education conversations. The qualitative component of the study revealed that the frequency and nature of sexual health discussions were significantly shaped by gender roles and sexual desire. This evidence lends support to the findings of the study and provides further insight into the sociocultural aspects of sexual education, particularly in relation to the negative perceptions often associated with it in the context of women.[14] Even though women sexual education's is sustained by the social stigma about sex, this allows women to be well-informed regarding STIs, have less high-risk sexual activities and consequently less incidence of STI's.

Another study conducted recently by Burrell et al,[15] identified that women are more knowledgeable about sexual health than men, supporting the hypothesis and results. One of the most significant findings of Burrell's research was that women are more inclined to seek urgent care or clinical guidance when confronted with sexual health concerns or uncertainties. Furthermore, this study emphasizes the discrepancy between the sexual maturation of males

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and females and proposes that the sexual education provided should consider the disparate maturation processes of the two genders. This may explain the discrepancy observed between male and female education, as current programs lack specific gender-based requirements for sexual advice based on sexual maturation times.[15]

There is a clear indication that men are engaging in higher-risk sexual behaviors, potentially due to gaps in knowledge and awareness about sexual health. Addressing these educational shortcomings could lead to more informed decisions and safer sexual practices, ultimately reducing the risks of STIs and unintended pregnancies. Percentual differences are presented in the following bar-graph, with a clear comparison between males and females.

The data analysis revealed that men engage in riskier behaviors and demonstrate a lack of knowledge regarding the appropriate use of contraceptive methods, thereby confirming our initial hypothesis. By identifying this high-risk group and the lack of gender-specific sexual education, it is possible to suggest the creation of targeted educational programs designed to promote sexual health in men. The destigmatisation of this topic must commence at an early stage of sexual education and be reinforced throughout the lives of young adults. Despite the identification of a higher level of sexual education, method use and lower incidence of high-risk behavior among women, a proportion of this group has not received this type of education and engages in high-risk sexual activities. It is imperative that efforts to promote sexual guidance consider the specific needs of both men and women.

CONCLUSION

The survey data not only reveals significant gender disparities in sexual health behaviors, with male students demonstrating a greater proclivity for high-risk behaviors than their female counterparts, but also serves to underscore a broader issue: the enduring prevalence of risky sexual practices among young adults. These findings emphasize the pressing necessity for comprehensive and accessible sexual health education that encompasses not only the mechanics of STI transmission and prevention but also the socio-cultural factors that influence behaviors.

The persistence of such risky behaviors among young adults is indicative of the necessity for a multi-faceted approach that combines education, accessible healthcare services, community engagement and policy support to create an environment conducive to informed sexual health decisions. By addressing these needs, it is possible to work towards a reduction in the incidence of STIs and the fostering of a culture of sexual health responsibility and empowerment among young people.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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