

RESEARCH ARTICLE

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Gender Differences in Smoking Attitude among Saudi Medical Students

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Abstract

Background: Smoking is a growing public health problem throughout the world. However, the attitude of males and females toward smoking may differ. Therefore, this study examines gender differences in smoking behavior and attitude among Saudi medical students. **Methods:** From January 2020 to August 2020, a snowball cross-sectional online survey was conducted in five major regions of Saudi Arabia. Medical students (18 years or older) were invited to respond to the questionnaire. **Results:** Out of the 421 respondents, 255 (60.6%) were female, 243 (57.7%) were between 18 and-24-year-old, and 164 (39%) were from the Eastern Province. The overall prevalence of smoking was 25.4% and was higher among males than females [(44% and 13.3%, respectively), $P < 0.001$]. However, there was no significant difference in the mean score of the overall attitude towards smoking between males and females [(3.02±0.44 and 3.00±0.34), respectively, $P=0.64$]. However, more female students believed e-cigarettes were harmful to health than male students [(4.19±1.04 and 4.45±0.9), respectively, $P=0.002$]. **Conclusion:** The study showed that male students smoke more than female students, and there were no significant differences in the overall attitudes score towards smoking. Therefore, campaigns are needed to decrease smoking rate, especially among male students.

Keywords: Cigarette smoking- tobacco smoking- smoking behavior- smoking perception- tobacco-related disparities

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Introduction

Tobacco smoking is the leading cause of death, with 5.4 million people dying each year from tobacco-related illnesses (Jradi and Al-Shehri, 2014), inflicting damage to the global economy, which fees billions annually (Al

Kalif et al., 2021). Furthermore, tobacco contains about 28 carcinogens, which kill more than 15% of men and more than 7% of women annually (Wickramasinghe et al., 2021). In Saudi Arabia, the general adult population smokes at about 21%; college students smoke at 25% (Jradi and Al-Shehri, 2014). Therefore, the mortality cost

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attributable to smoking was estimated at 8.76% in the general population (Nagi et al., 2021). Furthermore, of the total mortality cost in Saudi Arabia showed that smoking prevalence was approximately 25.6% among male students compared to 4.6% of female students (Mahfouz et al., 2014). However, studies of tobacco smoking among medical students in Saudi Arabia demonstrated a marked variation in smoking prevalence ranging between 24% and 42% (Hassan et al., 2014; Awan et al., 2015; Eldalo et al., 2015; Alshanberi et al., 2021a). Concerning the medical student's awareness of smoking, several studies assessed awareness, knowledge, and attitudes toward tobacco use (Jradi and Al-Shehri, 2014; Awan et al., 2015; Alhawsawi et al., 2019; Alshehri et al., 2019; Natto, 2020; Alzahrani et al., 2021). In addition, a recent study showed that smoking medical students had more negative smoking attitudes than non-smokers (Alshehri et al., 2019). Therefore, healthcare professionals need to assess the attitudes of smoking, as they are role models for people and play an essential role in the smoking cessation process (Initiative, 2005). Unfortunately, there are no studies to assess gender differences in smoking attitudes among Saudi medical students to the best of our knowledge. Therefore, this study aims to evaluate gender differences in smoking behavior and attitudes among Saudi medical students.

Materials and Methods

Study area, design, and period

This study is a web-based cross-sectional survey conducted over eight months, from January to August 2020, in the five regions of Saudi Arabia.

Study participants

A virtual snowball sampling method was used in this study and invited Saudi medical students (18 years and over).

Questionnaire designed

This research developed a questionnaire based on a literature review consisting of four closed questions. The questionnaire is produced in English and Arabic. The questionnaire consists of three parts. The first part is related to sociodemographic data of the participants and consists of six items (gender, age, marital status, place of residence, monthly income, and smoking status). The second part is related to smoking attitudes and has four items to assess participants' understanding of the harmful effects of smoking in the form of a 5-point Likert scale (1 strongly disagree, 5 strongly agree); 1st item is "It's annoying to be near a person who is smoking", 2nd item "Smoking must be prohibited on campus", 3rd item "Electronic cigarettes are not harmful to one's health, the last item "Smoking is only harmful if someone smokes for many years". The last part is related to the source of information about smoking.

The pilot pre-test questionnaire was conducted from January 14th to January 17th, 2020. A total of 37 people accepted the questionnaire at this stage to test its validity and reliability to ensure that it is easy to understand. Cronbach's α coefficient is used to test the internal

consistency of the questionnaire was more significant than (0.7). The responses from the pilot study were not included in the final study results.

Data collection tools and procedure

Data were collected online; Google Forms and WhatsApp sent the questionnaire link. Before participating in this study, informed consent of the respondents had been obtained.

Statistical Analysis

Data were analyzed using SPSS for Windows version v.25 (SPSS Inc, Chicago, IL, USA). The Pearson chi-square test (χ^2) and Mann-Whitney U test were used to analyze the results, with the significance level set at $P \leq 0.05$.

Results

Sociodemographic characteristics of the study population

Table 1 shows the demographic status of the 421 Saudi medical students. The majority were female students (N = 255, 60.6%), 341 (81%) were married, and 243 (57.7%) were in the age group of 18-24 years. Of all the responders, 164 (39%) were from the Eastern Province.

Prevalence of smoking among Saudi medical students and related sociodemographic

The smoking prevalence among Saudi medical students was 107 (25.4%) (Table 1) and was higher among male students than female students (44% and 13.3%), respectively ($p < 0.001$) (Table 1, Figure 1).

Smoking pattern among Saudi medical students

The practice of smoking was as follows: cigarettes 49 (45.8%), shisha 41 (38.3%), e-cigarettes 15 (14%), and other types of smoking 2 (1.9%). Male students significantly smoke more cigarettes (N=41, 56.2%) than females (N=8; 23.5%), while female students smoke more Hookah/shisha (N=23, 67.6%) than males (N=18, 24.7%), ($P < 0.001$) (Table 2).

Gender difference in the mean score of smoking attitudes questions

There was no statistical difference in the overall mean score of smoking attitudes between male and female students ($P=0.638$) (Table 3). Conversely, the response to each of the four questions about attitudes toward smoking mean differences. For example, for females, the highest mean score was 4.45 out of a 5-point scale for the disagreement that electronic cigarettes are not harmful to one's health, followed by the mean score of 4.44 out of a 5-point scale for female students who think that it is annoying to be near a person who is smoking. In contrast, the lowest mean score was for female students who thought smoking must be prohibited on campus by 1.36 out of 5 scales.

Source of Information regarding harmful of smoking according to male and female students

Table 1. Sociodemographic Variables of the Total Respondents and a Comparison between Male and Female Smokers, N= 421

| Variables | Total N (%) | Smokers | | (χ^2) P |
|------------------------|-------------|-----------|-----------|-----------------|
| | | Gender | | |
| | | Male | Female | |
| | | 73 (44) | 34 (13.3) | (49.80) <0.001* |
| Age | | | | |
| 18-24 | 243 (57.7) | 25 (34.2) | 22 (64.7) | (8.99) 0.01* |
| 25-34 | 154 (36.6) | 46 (63) | 11 (32.4) | |
| 35-44 | 21 (5.0) | 2 (2.7) | 1 (2.9) | |
| Above 44 | 3 (0.7) | 0.0 (0.0) | 0 (0.0) | |
| Marital Status | | | | |
| Single | 341 (81) | 59 (80.8) | 25 (73.5) | (0.731) 0.39 |
| Married | 76 (18.1) | 14 (19.2) | 9 (26.5) | |
| Divorce/widow | 4 (1) | 0.0 (0.0) | 0.0 (0.0) | |
| Place of living | | | | |
| Eastern Province | 164 (39) | 19 (26) | 10 (29.4) | (5.27) 0.26 |
| Western Province | 111 (26.4) | 19 (26) | 12 (35.3) | |
| Northern Province | 24 (5.7) | 16 (21.9) | 3 (8.8) | |
| Southern Province | 56 (13.3) | 3 (4.1) | 2 (5.9) | |
| Central Province | 66 (15.7) | 16 (21.9) | 7 (20.6) | |
| Monthly income | | | | |
| 800-1332 USD | 171 (40.6) | 20 (27.4) | 14 (41.2) | (4.89) 0.18 |
| 1333– 2665 USD | 39 (9.3) | 5 (6.8) | 2 (5.9) | |
| 2666- 4000 USD | 28 (6.7) | 12 (16.4) | 1 (2.9) | |
| > 4000 USD | 183 (43.5) | 36 (49.3) | 17 (50) | |

χ^2 , Chi-square test; *, Significant at 0.01 level, P, P-value.

Figure 2 shows that male and female students rely on medical care professionals' information regarding the dangers of tobacco (57.8% and 55.3%), respectively. The 2nd source of information regarding the harm of smoking was social media and the internet (30.1% and 24.3%), respectively.

This study examined gender differences in attitudes toward smoking among Saudi medical students. As they are considered role models for people, attitudes towards smoking are necessary among medical students and medical professionals (Initiative, 2005).. However, only a few studies have been conducted in Saudi Arabia that focused on the knowledge, attitudes, and practice of

Discussion

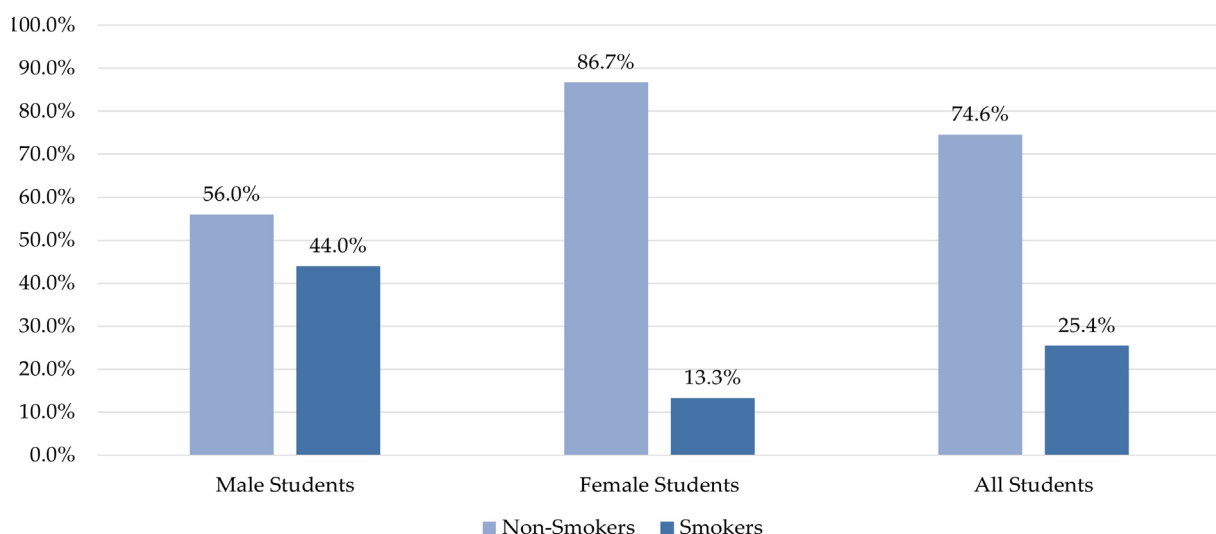


Figure 1. Prevalence of Smoking among Saudi Medical Students According to Gender

Table 2. Gender Association with Smoking Pattern among Smokers' Students, (N=107)

| Type of smoking | Male (N=73) | Female (N=34) | All smokers (N=107) | χ^2 | P |
|-----------------|-------------|---------------|---------------------|----------|----------|
| Cigarettes | 41 (56.2) | 8 (23.5) | 49 (45.8) | 18.47 | <0.001** |
| Hookah/Shisha | 18 (24.7) | 23 (67.6) | 41 (38.3) | | |
| E-cigarettes | 12 (16.4) | 3 (8.8) | 15 (14) | | |
| Others | 2 (2.7) | 0 (0.0) | 2 (1.9) | | |

χ^2 , Chi-square test; **, Significant at 0.01 level; P, P-value

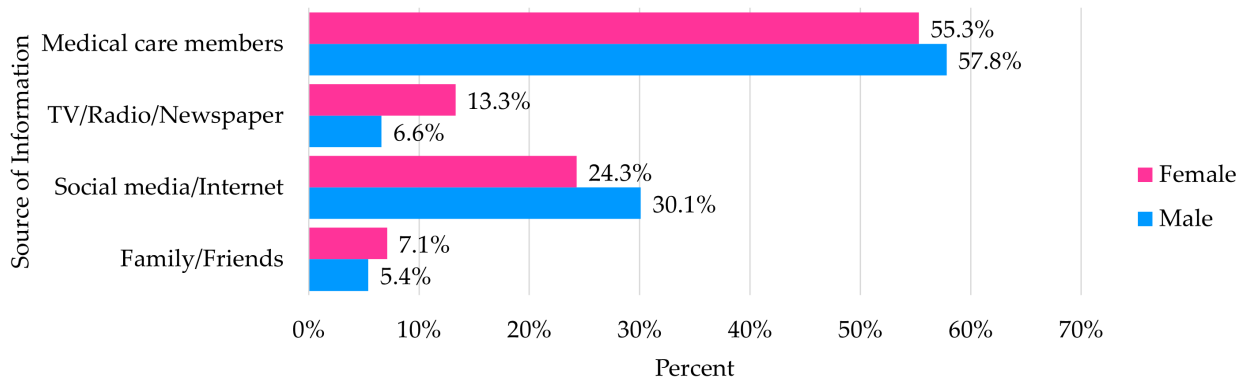


Figure 2. Information Regarding the Harmful Effect of Smoking among Saudi Medical Students According to Gender.

smoking among medical students (Jradi and Al-Shehri, 2014; Alhawsawi et al., 2019; Alshehri et al., 2019; Natto, 2020; Alzahrani et al., 2021). To the best of our knowledge, this study is the first to document gender differences in smoking attitudes among medical students in Saudi Arabia.

Our study found that smoking among the participating medical students was 25.4%. This finding is consistent with previous studies from Saudi Arabia that showed a prevalence of 29.6-42.3% (Hassan et al., 2014; Awan et al., 2015; Eldalo et al., 2015; Alshehri et al., 2019; Natto, 2020; Alshanberri et al., 2021a). However, one study showed a much lower smoking prevalence, only 16.8% among undergraduate students (Mahfouz et al., 2014). These studies differ because they were conducted inside university campuses. In contrast, our study was limited to the researchers' network through WhatsApp application invitations.

In addition, the current study found a difference in the age of smokers among gender, with about 64% of female smokers being 18-24 years and 63% of male smokers being 25-34 years. In the current study, we did not find a significant difference in smoking attitudes between males

and females. This finding is different from a previous Saudi survey that showed males had a better perspective (Alshanberri et al., 2021a).

This study showed that 14% of respondents smoke e-cigarettes, compared to a survey conducted in 2020 among medical students at Umm Al-Qura University in Saudi Arabia, which showed that less than 30% were smokers (Alshanberri et al., 2021b). In addition, the current study showed a high percentage of 38.3% of the students being smokers of hookah/Shisha, which is different from a previous study of 20% as waterpipe smoking has become more prevalent in many countries (Almogbel et al., 2021).

In the present study, the prevalence of cigarette smoking is more common among males than female students (44% and 13%, respectively). This finding is consistent with studies from Saudi Arabia that showed males smoke tobacco higher than females (18%-31%) and (5.9%-14%), respectively (Jradi and Al-Shehri, 2014; Mahfouz et al., 2014; Alshehri et al., 2019). This gender difference can be explained by differences in cultures and norms of practices.

Our findings must be viewed in the context of several limitations. First, the results are based on self-reports

Table 3. Mean Score of Smoking Attitudes among Male and Female Students, (N=421)

| Attitudes Questions | Male | Female | U | P |
|---|-------------|-------------|-------|----------|
| | N=166 | N=255 | | |
| | Mean (SD) | Mean (SD) | | |
| It's annoying to be near a person who is smoking | 4.10 (1.16) | 4.44 (1.00) | 17324 | <0.001** |
| Smoking must be prohibited on campus | 1.80 (1.25) | 1.36 (0.92) | 17093 | <0.001** |
| Electronic cigarettes are not harmful to one's health ^a | 4.19 (1.04) | 4.45 (0.9) | 17964 | 0.002** |
| Smoking is only harmful if someone smokes for many years ^a | 2.00 (1.29) | 1.73 (1.15) | 18721 | 0.024* |
| Overall attitude score by gender | 3.02 (0.44) | 3.00 (0.34) | 20625 | 0.638 |

U, Mann-Whitney U; P, P-value; *, Significant level at 0.05**; Significant level at 0.01, ^aReversed questions

and may not reflect actual behavior. Second, the survey response is based on the author's network; thus, there is a lack of input from other people outside this circle. Third, since the sample is not random, the participants in this study are primarily female students, and the male-to-female ratio observed in this study may not represent actual gender representations. Finally, people who cannot access the internet or devices may have been excluded from the study. Thus, more longitudinal studies, larger sample sizes, and face-to-face questionnaires are needed to assess the effectiveness of tobacco awareness programs. Nevertheless, current research results provide helpful information in determining tobacco awareness programs.

In conclusion, this study showed a low prevalence of tobacco use among Saudi medical students and found that male students smoke more. However, most participants did not show significant differences in attitudes towards smoking. Therefore, a behavioral smoking cessation program may be required immediately. Moreover, further studies are necessary to evaluate the effects of smoking awareness to minimize the smoking rates and improve the attitudes and habits of medical students.

Author Contribution Statement

Supervision, Alnasser, A.H.A.; Project administration, Alnasser, A.H.A.; Methodology, Alnasser, A.H.A.; validation, Alnasser, A.H.A.; Formal analysis, Alnasser, A.H.A.; Investigation, Kheimi R.M.A., Alibrahim R.M.S., Albanawi N.A.H., Almeshal A.K.A., Alsomali H.M.H., Al Kalif M.S.H.; Data curation, Alnasser, A.H.A.; Writing-original draft preparation, Alnasser, A.H.A., Al Sayed Ahmed H.H., Khamees S.H.A., Al-Thubiani W.S.S., Alqurashi D.S.M, Alrashed A.A.A., Alburai J.A.H.; Manuscript review, editing and preparation, Alnasser, A.H.A. and Al-Tawfiq J.A.; Proofreading: Alnasser A.A.H. and Al Kalif M.S.H

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Ethics approval

This study did not require ethical approval, was conducted voluntarily, and secured all data.

Data Availability Statement

The data can be obtained by contacting the corresponding author.

Conflict of Interest

The authors declare no conflict of interest in this study. This research received no external funding. However, the principal investigator can provide the data if requested.

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