Article

SMOKES: Study of Measurement of Knowledge and Examination of Support for tobacco control policies

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Abstract:

Background: Tobacco use remains a major global health concern, and understanding the factors that influence tobacco-related knowledge and support for tobacco control policies is critical for effective development of tobacco control policies that are accepted by the public. **Objectives:** This study introduces the rationale, design, methodology, and participants of the SMOKES Study (Study of Measurement of Knowledge and Examination of Support for tobacco control policies), which is conducted to evaluate tobacco use, tobacco-related knowledge and attitude, as well as support for tobacco control policies among college and university students. **Methods:** The SMOKES Study was designed to address significant gaps in literature by focusing on college and university students in a non-Western context. A multi-center, cross-sectional design was employed to collect data from a diverse sample of college and university students across different geographical provinces in Iran. The survey instrument incorporated a range of measures covering socio-demographic characteristics, university-related variables, family tobacco use status, personal tobacco consumption behaviors (including detailed assessments of cigarette, hookah, and electronic cigarette use), and attitudinal as well as knowledge-based assessments related to vaping. Support for tobacco control policies is also measured. Data were collected using an online survey that included self-administered questionnaires, enabling access to a large diverse sample. This study may be used to determine the prevalence of ever and current use of cigarettes, electronic cigarettes, and hookah, as well as examining the correlates of single, dual, and poly-tobacco use. The study also aims to assess the role of social determinants, attitudes, and ethnic/geographic differences in shaping these outcomes. **Results:** The study sample consisted of 2403 college and university students, including undergraduates enrolled in different academic programs from all faculties and disciplines. Participants were drawn from universities across 15 provinces, and 11 ethnic groups, ensuring a heterogeneous sample with respect to socio-demographic background, ethnicity, and institutional affiliation. This diversity enhances the generalizability of the findings and allows for the exploration of subgroup differences in tobacco use patterns and policy support. **Conclusions:** The SMOKES Study offers a framework for examining tobacco-related knowledge and the acceptability of tobacco control policies among a key part of the population, being college and university students. By providing detailed insights into the prevalence and correlates of tobacco knowledge, attitude, use, as well as the tobacco control policy support, the study lays the groundwork for tailored public health interventions and more effective tobacco regulation strategies particularly for college campuses in a non-Western setting.

Keywords: Tobacco, College and University Students, Policy, Knowledge, Attitude, Smoking, Electronic Cigarette, Hookah

1. Background and Rationale

Tobacco use remains a critical global health challenge [1,2], accounting for millions of preventable deaths annually and contributing substantially to the burden of chronic diseases [3,4]. The health consequences of tobacco consumption extend well beyond individual morbidity and mortality, affecting entire communities and imposing significant economic costs on healthcare systems and societies at large [5]. This pervasive impact underscores the urgency of implementing effective control strategies to mitigate tobacco-related harms worldwide.

In response to the adverse health and societal impacts of tobacco use, a range of tobacco control policies have been developed and implemented globally [6-8]. These policies, which include measures such as advertising bans, public smoking restrictions, taxation, and cessation support programs, have been shown to reduce tobacco consumption and its associated health risks in many settings [9-11]. However, while some evidence supports the effectiveness of these interventions in certain regions, variations in cultural, economic, and regulatory contexts suggest that their impact may differ across populations [2,12]. Consequently, there is a need to better understand how these policies perform in less-studied environments, particularly in non-Western contexts.

The level of support for tobacco control policies among college and university students plays a pivotal role in shaping community norms and public health advocacy [9]. As future leaders, these students are uniquely positioned to influence societal attitudes and policy-making processes in the long term. Their endorsement of tobacco control measures not only contributes to creating a healthier campus environment but also signals broader community acceptability, which is essential for the successful implementation and sustainability of such policies [13-15]. By actively engaging in and supporting these policies, college and university students may help foster an environment where tobacco regulation is viewed as a collective responsibility, ultimately contributing to the advancement of public health initiatives on a larger scale.

1.1. Aim

The aim of this study is to present the SMOKES Study: Study of Measurement of Knowledge and Examination of Support for tobacco control policies. This study evaluates tobacco use, related knowledge, and support for tobacco control policies among college and university students. Based on the aims, research questions, and hypotheses (Table 1), we developed and performed the SMOKES Study, which intends to provide insights into the interplay between tobacco use, related knowledge, and policy support among college and university students.

Table 1. Study Aims, Questions, and Hypotheses

Aims
To investigate ever and current use of tobacco products, as well as attitude, knowledge, and support for tobacco control policies
Research Questions
1.   What are the prevalence rates of ever and current use of cigarettes, electronic cigarettes, and hookah?
2.   What is the prevalence of single, dual, and poly-tobacco use?
3.   What factors are associated with ever and current use of cigarettes, electronic cigarettes, and hookah?
4.   What factors are associated with single, dual, and poly-tobacco use?
5.   How do social determinants influence tobacco use behaviors?
6.   What role do knowledge and attitudes play in shaping tobacco use behaviors?
7.   Are there ethnic and geographic differences in tobacco use and support for tobacco control policies?

8. What is the current level of support for tobacco control policies among students?
9. What factors influence support for tobacco control policies among college and university students?
10. How is support for tobacco control policies linked to tobacco use, considering both ever and current use?
11. In what contexts (places) do college and university students use electronic cigarettes?
12. What are the motivations (reasons) behind electronic cigarette use among college and university students?
13. How do gender differences influence the patterns and factors explored in the questions above?
14. How do attitudes, knowledge, and tobacco use differ by college/university major?
15. How do attitudes, knowledge, and tobacco use differ by college/university level or type?

Hypotheses
- H1: Tobacco users will exhibit lower levels of support for tobacco control policies compared to non-users.
- H2: Dual and poly-tobacco users will report lower support for tobacco control policies than single product users.
- H3: Higher levels of tobacco-related knowledge and more positive attitudes toward tobacco control will be associated with lower prevalence of tobacco use.
- H4: Social determinants, including socioeconomic status, ethnicity, and geographic location, will be significantly associated with both tobacco use patterns and levels of policy support.
- H5: There will be significant ethnic and geographic differences in both tobacco use and support for tobacco control policies among college and university students.
- H6: Current tobacco users will differ significantly from ever users in their support for tobacco control policies.
- H7: Knowledge and attitudes will mediate the relationship between tobacco use behaviors and support for tobacco control policies.

1.2. Conceptual Model

The conceptual model underpinning the SMOKES Study is shown in Figure 1. This conceptual model integrates multiple layers of influence to explain tobacco use behaviors and the support for tobacco control policies among college and university students. At its core, the model posits that distal social determinants interact with individual-level factors (such as motivation for use, attitudes, and knowledge) to shape the context and pattern of tobacco use, which in turn informs policy support. Social determinants, including socioeconomic status, ethnicity, geographic region, and university-related characteristics, serve as the foundational layer of the model. These factors influence both exposure to tobacco-related environments and access to accurate health information. For instance, differences in income, educational background, and regional cultural norms may affect not only the prevalence of tobacco use but also the acceptance of tobacco control policies. By accounting for these variables, the model aims to capture the broader context within which individual decisions regarding tobacco use are made. At the individual level, attitudes toward tobacco use and the accuracy of tobacco-related knowledge play key roles. The model differentiates between correct knowledge (based on scientifically validated information regarding the harms of tobacco) and incorrect or incomplete knowledge that may foster misconceptions about tobacco's safety or benefits. Attitudes, influenced by both types of knowledge, determine the degree of receptivity to tobacco control measures. For example, a student with accurate information and a negative attitude toward tobacco is more likely to support stringent tobacco control policies, whereas misperceptions can lead to ambivalence or resistance. Motivational factors are critical in driving tobacco use. The model considers a range of personal motives, such as the desire for stress relief, social acceptance, or curiosity about novel tobacco products, including electronic cigarettes and hookah. These motivations can be further shaped by the individual's environment and social interactions. Understanding these drivers is essential for explaining why some students initiate or continue tobacco use despite widespread public health warnings. The contextual setting or place of use is another

integral component of the conceptual model. The environments where tobacco consumption occurs (such as on-campus social gatherings, off-campus settings, or within the home) can reinforce or mitigate tobacco use behaviors. The model posits that the normalization of tobacco use within specific places may either bolster individual consumption patterns or, conversely, serve as a focal point for targeted interventions and policy enforcement. Finally, the model distinguishes between three tobacco products (cigarettes, electronic cigarettes, and hookah) acknowledging that each product has unique usage patterns and social connotations. Tobacco use is further categorized into single, dual, and poly-tobacco use. This categorization allows for a nuanced analysis of how combinations of products may be differentially associated with social determinants, motivations, attitudes, and knowledge. For example, dual or poly-tobacco use might reflect more complex behavioral patterns and a higher degree of risk-taking, necessitating specialized intervention strategies.

In summary, the SMOKES Study conceptual model proposes that social determinants create a contextual backdrop that shapes individual motivations and attitudes toward tobacco use. These factors, coupled with the quality of tobacco-related knowledge and the context or place of use, drive the decision to engage in tobacco use, whether it be single, dual, or poly use across different products. Understanding these interrelated components is essential not only for delineating patterns of tobacco use but also for informing targeted public health interventions and tobacco control policies tailored to the needs of college and university students, who are the future leaders in their communities.
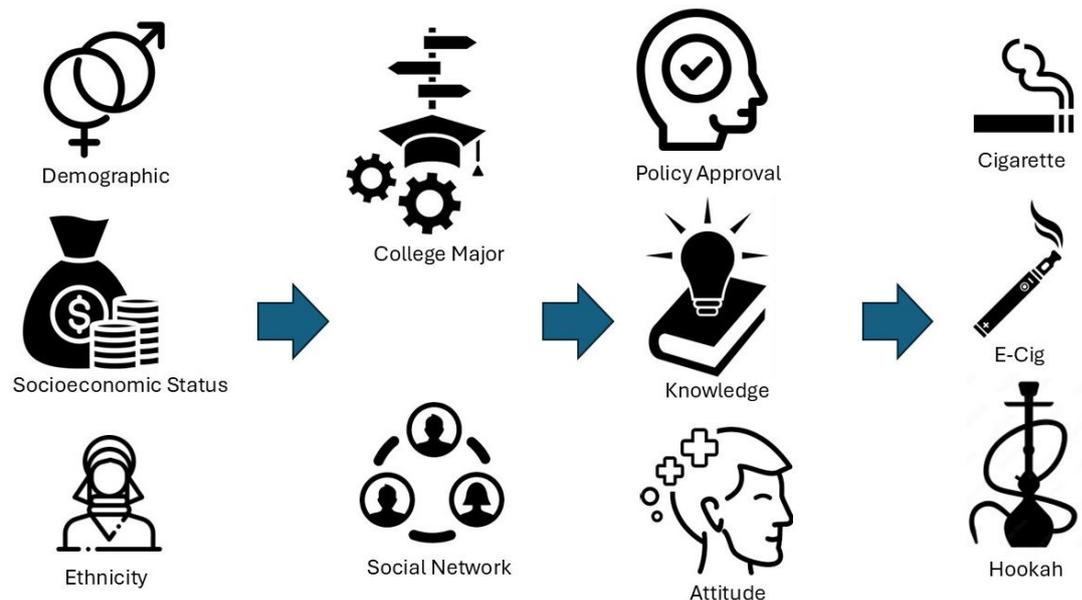

Figure 1. SMOKES Conceptual Model

1.3. Health Behavior Theories

Several health behavior theories and conceptual frameworks could be applied to the SMOKES Study to help explain the interplay between social determinants, motivation for use, attitudes, knowledge, and patterns of tobacco use and policy support among college and university students (Table 3). For example:

- **Social Ecological Model (SEM):** This framework [16] emphasizes multiple levels of influence (from individual or interpersonal, community, and policy levels) and is well-suited to capture how social determinants (e.g., socioeconomic status, ethnicity,

geographic context) interact with individual-level factors (knowledge, attitudes, motivation) to shape tobacco use behaviors and support for tobacco control policies.

- **Fundamental Cause Theory (FCT):** FCT [17-20] posits that socioeconomic factors and broader social conditions serve as fundamental determinants of health disparities by influencing access to flexible resources (such as money, knowledge, and social connections) that help individuals avoid risks or mitigate the impact of disease. Constructs: Socioeconomic status (including income, education, and occupation), access to flexible resources (e.g., money, knowledge, power, social connections), exposure to health risks, and resultant health outcomes.

- **Social Determinants Framework:** This framework [21-26] posits that health outcomes and behaviors are significantly shaped by the broad range of social, economic, and environmental conditions in which individuals live, work, and interact. Constructs: Socioeconomic status, education, employment, income, social support networks, neighborhood and physical environment, access to healthcare and social services, and overarching social policies.

- **Theory of Reasoned Action (TRA):** TRA [27] posits that an individual's behavioral intention, which is the immediate precursor to behavior, is determined by their attitudes toward the behavior and the subjective norms surrounding it. It can be applied to understand how evaluations of tobacco use and the influence of significant others shape both the decision to use tobacco and the endorsement of tobacco control policies. Constructs: Attitude toward the behavior, subjective norm, and behavioral intention.

- **Theory of Planned Behavior (TPB):** TPB [28] focuses on the role of attitudes, subjective norms, and perceived behavioral control in determining behavior. It can be applied to understand how individual attitudes toward tobacco and perceived social pressures influence tobacco use and the endorsement of tobacco control policies.

- **Health Belief Model (HBM):** The HBM [29] examines perceptions of susceptibility, severity, benefits, and barriers in relation to health behaviors. In the context of the SMOKES Study, it can help explain how correct or incorrect knowledge about tobacco-related harms and benefits affects both tobacco use and support for policies aimed at reducing these harms.

- **Social Cognitive Theory (SCT):** SCT [30] highlights the dynamic interaction between personal factors, environmental influences, and behavior. It is useful for understanding how observational learning, self-efficacy, and outcome expectations contribute to both the initiation of tobacco use and the acceptance (or rejection) of tobacco control measures.

- Integrating elements from these frameworks can provide a comprehensive basis for understanding the complex relationships among social determinants, motivation, attitude, knowledge, context of use, and patterns of single, dual, and poly-tobacco use, along with support for tobacco control policies.

Table 2. Health Behaviors Theories That Informed SMOKES Study

Social Ecological Model (SEM):   This framework emphasizes multiple levels of influence that shape behaviors, ranging from individual characteristics to broader policy contexts.   • **SMOKES Constructs:** Individual factors (e.g., knowledge, attitudes), interpersonal relationships (e.g., social networks, peer influence), organizational factors (e.g., institutional policies), community context (e.g., cultural and geographic influences), and existing policy (e.g., regulations).   **Theory of Planned Behavior (TPB):**

TPB posits that an individual's behavioral intentions, shaped by their attitudes, perceived social pressures, and sense of control, drive their actions.
- **SMOKES Constructs:** Attitude toward the behavior.

Health Belief Model (HBM):
HBM explains health behaviors through individuals' perceptions of the threat posed by a health problem and the benefits versus barriers of taking action.
- **SMOKES Constructs:** perceived benefits, perceived barriers.

Social Cognitive Theory (SCT):
SCT asserts that behavior is influenced by a continuous interaction between personal factors, environmental influences, and behavioral patterns, with a key emphasis on observational learning.
- **SMOKES Constructs:** Observational learning, and reinforcement.

Fundamental Cause Theory (FCT):
FCT posits that socioeconomic factors and broader social conditions fundamentally determine health disparities by affecting access to resources like money, knowledge, and social connections that help individuals avoid risks or mitigate disease impacts.
- **SMOKES Constructs:** Socioeconomic status (income, education, and occupation).

Social Determinants Framework: This framework asserts that health outcomes and behaviors are shaped by the social, economic, and environmental conditions in which individuals live, work, and interact.
- **SMOKES Constructs:** Socioeconomic status, education, employment, income, social networks, social and physical environment, access to services, and existing policies.

Theory of Reasoned Action (TRA): TRA posits that an individual's behavioral intention, shaped by their attitudes and subjective norms, directly precedes and influences their behavior, such as tobacco use and policy endorsement.
- **SMOKES Constructs:** Attitude toward the behavior.

2. Methods

2.1. Design and Setting

A multi-center, cross-sectional study was conducted among colleges and universities in Iran between 2024 and 2025. The study was administered online, with an invitation link distributed via student groups of each university in social media platforms, inviting students to participate by filling out the questionnaire. Social media platforms were used for questionnaire distribution, as people in Iran primarily use social media rather than email for updates, news, and general communication.

2.2. Sample and Sampling

To enhance diversity in terms of ethnicity, geography, and types of colleges/universities and majors, we selected 15 provinces (Figure 2) and included randomly at least one college or university from each province. Although the sample reflects the demographic characteristics of Iranian college and university students, the results are not nationally representative. The inclusion criteria for this study were Iranian college and university students actively enrolled in any academic discipline at universities across the 15 selected provinces at the time of the study. However, individuals who had graduated individuals, non-Iranian students, and participants who provided invalid responses, including inconsistent, unrealistic, or unanalyzable answers, were excluded from the study.

Figure 2. Map of Iran's provinces, showing the selected provinces with diverse geographical distribution for data collection in this multi-center study.

2.3. Measurement Tool

The study employed an online survey instrument designed to capture a wide range of variables across several domains, including socio-demographic characteristics, university-related attributes, family and personal tobacco use behaviors, knowledge and attitudinal measures regarding vaping and tobacco control policies. Questions were adapted from previously validated questionnaires [31-33]. Additionally, novel questions were added based on the opinion of experts in public health, pulmonology, and health policy. All questions were asked in Farsi language. Together, these variables provide a detailed multi-dimensional profile of the participants, facilitating the investigation of associations between tobacco use behaviors and support for tobacco control policies. The combination of nominal, dichotomous, continuous, and ordinal measures allow for additional analysis of both behavioral and attitudinal dimensions, thereby contributing valuable insights into the interplay between personal tobacco use and policy support within this sample.

University-related variables (Province, Degree/School Major, student Level, University type, Student year) were collected to contextualize the sample. These variables are measured on a nominal scale, providing categorical distinctions among regions, institutional types, academic levels, and years of study. Additionally, personal demographics such as sex (categorical), age (continuous), and ethnicity (categorical) were recorded. Marital status variables for students (Marital status of the student) and their parents (Marital status of the parents) are also categorical. Other socio-demographic indicators, including residence type and residence place (both categorical), employment status (work), and income variables (Income level of the family and Income level of the student), offer further context regarding the participants' background. The variable

exercise likely reflects the frequency or extent of physical activity and may be measured on an ordinal scale (Table 3).

Table 3. SMOKES Study Measures

Demographic Factors
Socioeconomic Status (SES) Indicators
Geographic Data
Tobacco Use in Social Network
College/University Data
Correct Electronic Cigarette Knowledge
Incorrect Electronic Cigarette Knowledge
Positive Electronic Cigarette Attitude
Negative Electronic Cigarette Attitude
Second-Hand Exposure to Electronic Cigarette Aerosol
Tobacco Use (Cigarette, E-Cigarette, Hookah)
Single, Dual, Poly Tobacco Use
Tobacco Control Policy Support

2.4. SMOKES Study Variables

2.4.1. Demographic and socioeconomic variables

Ethnicity: Ethnicity was self-identified and reported as Fars, Turk, Kurd, Lor, Mazani, Gilak, Balouch, Bakhtiari, Arab, Semnani and other ethnicities.

Socioeconomic Status (SES): Family income and own income as well as marital status of self and family, as well as self-employment were asked.

2.4.2. Geographic and college/university variables

University Province: University province included Tehran, Khorasan Razavi, Fars, East Azerbaijan, Esfahan, Yazd, Khouzestan, Kerman, Sistan and Balouchestan, Kermanshah, Mazandaran, Gilan, Semnan, Alborz, and Hamedan.

Universities Major: were Humanities and Social Sciences, Basic Sciences, Engineering and Technology, Medicine, Dentistry, Pharmacy, Nursing, Allied Health, Agriculture and Natural Resources, Architecture and Arts, and Veterinary Medicine.

Student Degrees: Students were either in associate's degree, bachelor's degree, master's degree, and doctorate or higher.

Type of University: Universities were either Government-Funded or Tuition-Based. Students were in college/University between one to eight years.

2.4.3. Tobacco Use in Social Network

Family Tobacco Use: To assess familial influences, multiple dichotomous items were included: Tobacco use by father, Tobacco use by mother, and tobacco use by siblings. These variables capture whether immediate family members or close acquaintances have a history of tobacco use, providing insight into the potential familial and social normalization of tobacco consumption.

2.4.4. Attitudes, Knowledge, and Tobacco Policy Support

A series of items were dedicated to assessing participants' reasons for vaping (n = 9), their knowledge about vaping (n =12), and their attitudes toward vaping (n = 10). These items are typically measured using Likert-type scales, enabling a nuanced evaluation of the intensity of agreement or disagreement with various statements. Similarly, support for tobacco control policies was assessed through a set of items (n = 12). Many of these

items employed an ordinal Likert-type response format, capturing the degree of endorsement for each policy measure. For tobacco policy support, 12 items were used with items such as "Are you aware of the current policy regarding the use of nicotine products in Iranian universities?"

2.4.5. Behavioral Measures

Tobacco Use: The survey captured participants' tobacco use behaviors with items that differentiate between lifetime and current use. For example, two single items measure cigarette use ever and cigarette use current indicate ever having used and current cigarette use, respectively. Similar measures were applied to hookah use (hookah use ever and hookah use current). In addition, hookah use frequency was also measured. Tobacco vaping behavior (use of electronic cigarette) was measured using these items: vape use ever, vape use frequency, vape use type (type of device), vape use flavor, vape use duration). Variables also measured common places in which vape is used. Vape use time also measured time of use. These variables provided detailed data on the contexts and temporal patterns of vaping. Additional items on vape use motivations as well as vape use quit and vape use university were measured. These variables were either categorical or ordinal scales.

2.5. Ethical considerations

This study was conducted in accordance with the principles outlined in the Declaration of Helsinki and was approved by the Ethics Committee of Shahid Sadoughi University of Medical Sciences, Yazd, Iran (ethics code: IR.SSU.MEDICINE.REC.1403.159). Participation was voluntary, and informed consent was obtained at the beginning of the study. On the first page of the study questionnaire, participants were presented with information about the aim of study and were asked to confirm their consent before proceeding.

2.6. Statistical Analysis

All analyses will be conducted using Stata 18. The initial step involves performing descriptive statistics to characterize the sample. For categorical variables, frequencies and percentages will be computed, while for continuous variables, means (or medians, as appropriate) along with standard deviations (or interquartile ranges) will be reported. These descriptive analyses will be performed overall and stratified by key subgroups, including tobacco users versus non-users, males versus females, and major versus minority ethnic groups. Subsequently, composite scores for each construct (e.g., knowledge, attitudes, policy support) will be developed. Items that do not adequately load on the intended constructs will be dropped based on reliability analyses using Cronbach's alpha, and both confirmatory and exploratory factor analyses will be employed to validate the measurement structure. Correlations among continuous variables (such as those related to tobacco-related knowledge, attitudes, and policy support) will be examined using Pearson correlation coefficients, leveraging the large sample size to ensure robust estimates. Prior to multivariable modeling, key assumptions (e.g., normality of distributions, absence of multicollinearity, and identification of outliers) will be rigorously tested. For outcome analyses, logistic regression models will be used to examine the associations with ever and current use of each tobacco product, as well as single, dual, and poly-tobacco use. Additionally, linear regression models (ordinary least squares) will be applied where appropriate for continuous outcomes. To assess mediational associations, Structural Equation Modeling (SEM) [34] will be utilized, incorporating both latent and observed variables in path models. Furthermore, interaction or stratified analyses will be performed to explore potential gender differences and variations between major and minority ethnic groups. These analyses will assess how social determinants, social network influences regarding tobacco use, attitudes,

knowledge, and support for tobacco control policies affect the use of individual tobacco products, as well as patterns of single, dual, or poly-tobacco use. Statistical significance will be determined at a p-value of <0.05.

3. Results

A total of 2403 college and university students (female-male ratio of 1:1) participated in the study and met the criteria. The mean age of participants was 22.30 (SE = .07; 95% CI = 22.16 to 22.44) ranging from 15 to 60.

Regarding university type, 76.12% (n = 1,826) of participants were enrolled in governmental institutions, while the remaining 23.88% (n = 573) attended non-governmental or private universities (Figure 3).
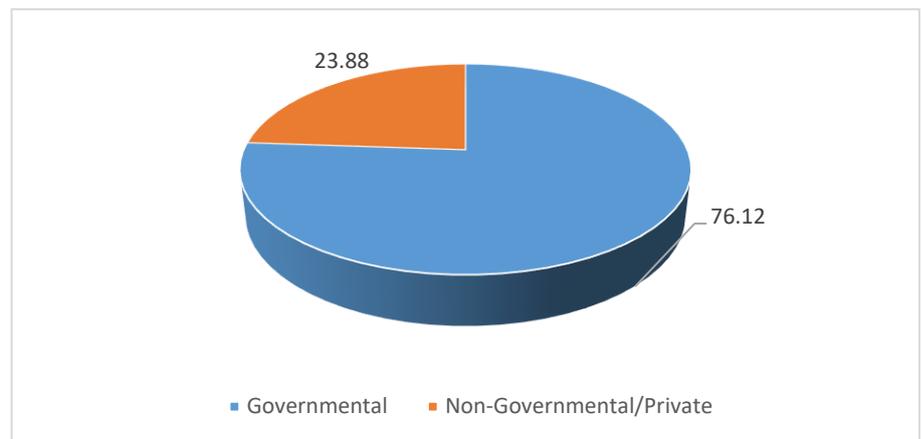
Figure 3. Distribution of University Type in the SMOKES Study Sample

In terms of university major, the largest group was from Medicine (43.38%, n = 1,036), followed by Engineering and Technology Sciences (13.32%, n = 318), and Humanities and Social Sciences (9.76%, n = 233). Other majors included Dentistry (8.88%, n = 212), Allied Health (8.12%, n = 194), Nursing (4.94%, n = 118), Basic Sciences (3.77%, n = 90), Architecture and Arts (3.69%, n = 88), Pharmacy (2.85%, n = 68), Veterinary Medicine (0.84%, n = 20), and Agriculture and Natural Resources (0.46%, n = 11). (Figure 4)
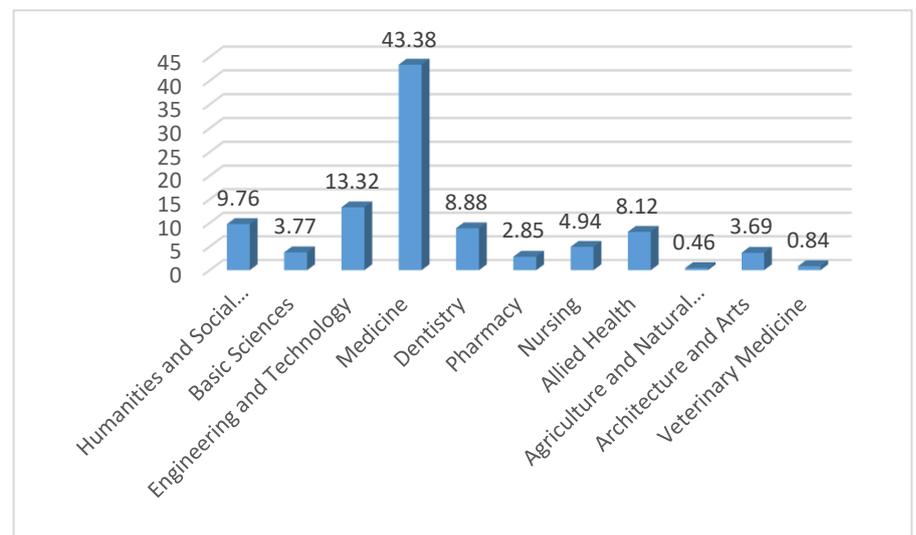
Figure 4. Distribution of College Majors in the SMOKES Study Sample

Participants were drawn from a wide range of provinces, with the highest representation from Yazd (14.61%, n = 350), followed by Mazandaran (10.93%, n = 262) and Tehran (10.64%, n = 255). Other provinces included Esfahan (9.22%, n = 221), Razavi Khorasan (8.76%, n = 210), Kermanshah (6.93%, n = 166), Fars (5.68%, n = 136), East Azerbaijan (5.63%, n = 135), Gilan (5.76%, n = 138), Kerman (4.97%, n = 119), Khuzestan (4.97%, n = 119), Sistan and Balouchestan (4.92%, n = 118), Semnan (3.05%, n = 73), Alborz (2.17%, n = 52), and Hamedan (1.75%, n = 42). (Figure 5)

Ethnically, the majority of students identified as Fars (57.75%, n = 1,356), followed by Turk (11.29%, n = 265), Kurd (6.81%, n = 160), Lur (5.79%, n = 136), and Mazani (5.88%, n = 138). Smaller proportions of the sample identified as Gilak (4.77%, n = 112), Balouch (2.00%, n = 47), Bakhtiari (1.75%, n = 41), Arab (1.19%, n = 28), Semnani (0.51%, n = 12) and other ethnicities (2.26%, n = 53).

In terms of academic level, the majority of the participants were pursuing a Doctorate or higher degree (52.19%, n = 1,253), followed by Bachelor's degree students (38.57%, n = 926), Master's degree students (6.66%, n = 160), and a smaller group of Associate's degree students (2.58%, n = 62).

Nearly half of the participants (49.9%) reported living with their family, which suggests that family-based housing is the most common arrangement among SMOKES participants. This group likely attended college in the same city as their family residence. In addition, about 40.4% lived in dormitories, indicating that communal living spaces are also common; participants in this group may have attended college in a different city from where their family lives. By contrast, only 9.5% lived in private housing without their family, and a very small number (0.21%) fell into the "Other" category. These results may point to a tendency for SMOKES participants to favor more traditional or communal living arrangements (Figure 5 and Table 4).
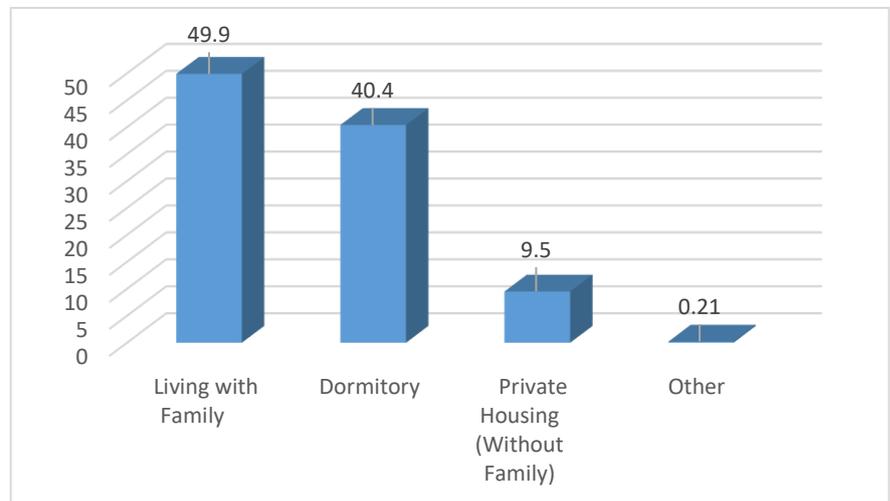

Figure 5. Distribution of Residence of the SMOKES Study Sample

Table 4. Participants in the SMOKES Study

	n	%	Cumulative %
University Major			
Humanities and Social Sciences	233	9.76	9.76
Basic Sciences	90	3.77	13.53
Engineering and Technology Sciences	318	13.32	26.84
Medicine	1,036	43.38	70.23
Dentistry	212	8.88	79.1
Pharmacy	68	2.85	81.95
Nursing	118	4.94	86.89
Allied Health	194	8.12	95.02
Agriculture and Natural Resources	11	0.46	95.48
Architecture and Arts	88	3.69	99.16
Veterinary Medicine	20	0.84	100
Province			
Tehran	255	10.64	10.64
Khorasan Razavi	210	8.76	19.41
Fars	136	5.68	25.08
East Azerbaijan	135	5.63	30.72
Esfahan	221	9.22	39.94
Yazd	350	14.61	54.55
Khouzestan	119	4.97	59.52
Kerman	119	4.97	64.48
Sistan and Balouchestan	118	4.92	69.41
Kermanshah	166	6.93	76.34
Mazandaran	262	10.93	87.27
Gilan	138	5.76	93.03
Semnan	73	3.05	96.08
Alborz	52	2.17	98.25
Hamedan	42	1.75	100
Residence			
Living with Family	1,198	49.9	49.9
Dormitory	970	40.4	90.3
Private Housing (Without Family)	228	9.5	99.79
Other	5	0.21	100
Sex			
Male	1,201	50	50
Female	1,201	50	100
Ethnicity			
Fars	1,356	57.75	57.75
Turk	265	11.29	69.04
Lur	136	5.79	74.83
Kurd	160	6.81	81.64
Mazani	138	5.88	87.52
Arab	28	1.19	88.71

Balouch	47	2	90.72
Gilak	112	4.77	95.49
Bakhtiari	41	1.75	97.23
Semnani	12	0.51	97.74
Other	53	2.26	100
University Level			
Associate's Degree	62	2.58	2.58
Bachelor's Degree	926	38.57	41.15
Master's Degree	160	6.66	47.81
Doctorate or Higher	1,253	52.19	100
University Type			
Governmental	1,826	76.12	76.12
Non-Governmental/Private	573	23.88	100

4. Discussion

The SMOKES Study provides a framework for investigating tobacco-related knowledge and the acceptability of tobacco control policies among college and university students in Iran. By incorporating a wide range of socio-demographic, behavioral, and attitudinal variables, this study addresses critical gaps in the literature (particularly the underrepresentation of non-Western contexts) and focuses on a population that is likely to shape future public health and policy landscapes. The design enables a nuanced exploration of the prevalence of cigarette, electronic cigarette, and hookah use; the correlates of single, dual, and poly-tobacco use; and the influence of social determinants on these behaviors. Moreover, by assessing tobacco-related knowledge and attitudes alongside policy support, the study offers valuable insights into potential drivers of both tobacco use and resistance to control measures.

The SMOKES study generates findings that can be compared with results from other contexts, particularly regarding the interplay between socioeconomic status and tobacco use within social networks, as well as the use of various tobacco products [35-40]. The study explores risk factors and population differences across single, dual, and poly-tobacco use, and it offers valuable insights into how e-cigarette use compares with conventional tobacco use. For instance, one key question is what percentage of individuals initiate tobacco use with cigarettes before transitioning to e-cigarettes in an attempt to replace conventional smoking. Moreover, the study examines the distinct correlates of conventional versus electronic cigarette use and investigates potential gender differences in these patterns. In addition, the SMOKES study provides a unique resource for understanding how health outcomes are linked to the use of each tobacco product, given its focus on young and emerging adults [41]. Larger-scale studies such as Population Assessment of Tobacco and Health (PATH) [42] study, National Survey on Drug Use and Health (NSDUH) [43-46], Monitoring the Future (MTF) [47,48], and Healthy Mind Survey[49] offer useful points of comparison for these findings.

4.1. Policy Implications

The findings of the SMOKES Study have several important policy implications for tobacco control, particularly as future publications further elucidate these relationships. Given the lower levels of policy support among tobacco users, targeted interventions should be developed that address the specific needs and misconceptions of this group. Future research should focus on identifying high-risk subgroups through the development of screening tools, which could facilitate early intervention and tailored

cessation programs. Moreover, advocacy efforts aimed at enhancing tobacco-related knowledge and reshaping attitudes toward tobacco control are essential, especially within the college student demographic, who are future leaders and influencers in society. Policy initiatives may include the integration of tobacco cessation programs within university health services, the implementation of educational campaigns that emphasize the harms of emerging tobacco products, and the development of community-based strategies that promote collective responsibility for public health. Such multifaceted approaches may help build a supportive environment for additional tobacco control policies and ensure that interventions are culturally and contextually relevant.

4.2. Limitations

Despite its strengths, several limitations warrant consideration. First, the cross-sectional design precludes causal inferences regarding the associations between tobacco use, knowledge, and policy support. Second, the reliance on self-reported data introduces the possibility of reporting bias, particularly in relation to socially sensitive behaviors such as tobacco use. Third, although the study sample is heterogeneous, it is not nationally representative; the findings reflect patterns among college and university students from selected provinces in Iran without the use of statistical weighting to generate representative estimates. Furthermore, emerging patterns in tobacco use (particularly the rapid evolution of electronic cigarette products and hookah consumption trends) suggest that the dynamics captured in this study may change over time, underscoring the need for ongoing surveillance.

5. Conclusion

In conclusion, the SMOKES Study offers a new data set that can help us better understand the interplay between tobacco use, related knowledge, and support for tobacco control policies among college and university students in Iran. By addressing a significant gap in literature and employing an online survey instrument across diverse university settings, this study lays a strong foundation for future public health initiatives and policy interventions. Despite certain limitations (including its cross-sectional design, non-nationally representative sample, and the absence of weighting procedures) the insights gained provide valuable direction for targeted interventions, advocacy, and the development of tailored cessation programs. Ultimately, fostering increased support for tobacco control policies among college and university students could play a critical role in advancing community health and shaping more effective tobacco regulation strategies in the future.

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