



The Role of Risk Communication in Predicting Intention to Quit Hookah Smoking

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Abstract

Background: Despite the known harms of hookah smoking, its prevalence is increasing worldwide. Therefore, effective strategies to strengthen cessation efforts are urgently needed. This study aimed to determine the role of risk communication in predicting the intention to quit hookah smoking among Iranian adults.

Methods: This cross-sectional study was conducted with 485 hookah smokers aged 18 to 59 years from Kermanshah (western Iran) and Ardabil (northwestern Iran). A cluster sampling method was used to select hookah-smoking venues, and simple random sampling was applied to recruit participants. Data were collected using a demographic form, a questionnaire based on the Extended Parallel Process Model (EPPM), and a health warning questionnaire. Multiple linear regression was used to determine the predictors of intention to quit hookah smoking.

Findings: The mean age of participants was 30.24 ± 8.29 years. The health warning was the strongest predictor of the intention to quit hookah smoking ($\beta = 0.359$, $P < 0.001$). Among EPPM constructs and demographic variables, defensive motivation ($\beta = -0.142$, $P = 0.016$), self-efficacy ($\beta = 0.139$, $P = 0.016$), perceived severity ($\beta = 0.128$, $P = 0.032$), and age ($\beta = 0.140$, $P = 0.009$) were significant predictors. The final regression model explained approximately 36% of the variance in intention to quit hookah (Adj-R² = 0.356).

Conclusion: The health warning was the strongest predictor of intention to quit hookah smoking, highlighting the importance of targeted risk communication. Defensive motivation, perceived severity, self-efficacy, and age were other significant predictors. Public education programs should focus on increasing perceived severity, enhancing self-efficacy, and reducing defensive motivation, especially targeting younger populations to curb hookah use.

Keywords: Smoking cessation, Water pipe Smoking, Self-efficacy, Health communication

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Introduction

Hookah smoking is a major public health issue worldwide that has surpassed cigarette consumption in some countries, especially among youth.¹ Over the past two decades, hookah has become the most common form of tobacco use among young people in the Middle East.² A study of individuals over the age of 15 years in Iran reported a 17.6% prevalence of hookah use, which was higher among men than women.³ Another study in southeast Iran showed a lifetime prevalence of 43.8% among adults.⁴ Among Iranian college students, 34.1% reported ever using hookah, and 26.28% were current users.⁵

Evidence suggests that hookah smoke contains high levels of nicotine, carbon monoxide, and heavy metals, sometimes exceeding those found in cigarettes.⁶ Systematic reviews have linked hookah smoking to several adverse health outcomes, including lung and esophageal cancers, respiratory diseases, low birth weight, oral diseases, bladder cancer, oral dysplasia, and coronary heart disease.^{7,8} However, many hookah users believe it is less harmful and less addictive than cigarette smoking.⁹ Despite these harmful consequences, hookah use is rapidly increasing in many regions.^{10,11}

Intention to quit is a critical first step toward smoking cessation.^{12,13} The Expanded Parallel Process Model



(EPPM) is a well-known framework for examining motivation and behavior change, suggesting that individuals engage in healthy behavior through protective motivation strategies. As a foundational theory, Witte introduced this model by integrating several theoretical constructs into a single framework to explain how people evaluate fear appeals and adopt response strategies.^{14,15} According to this theoretical basis, individuals are more likely to engage in protective behaviors when they perceive a high level of threat and possess strong self-efficacy.¹⁶ In tobacco control, the EPPM suggests that visual health warning messages should incorporate risk perception and self-efficacy to encourage quitting.¹⁷ This refers precisely to the broader issue of risk communication.

Effective risk communication can be a targeted strategy to enhance risk perception and stimulate motivation to quit smoking, in line with theoretical perspectives suggesting that risk perception is a prerequisite for behavior change.¹⁸ Risk messages are the first step in protective measures, and the use of health warnings through visual cues remains a primary goal of risk communication.¹⁹ Studies have shown that visual warnings are among the most effective ways to communicate the range and severity of health risks to smokers.²⁰

While the EPPM has been successfully applied in various health behavior studies,¹⁵ its use in the context of hookah smoking remains limited. Despite the well-documented health risks associated with hookah smoking and its rising prevalence, especially in Iran, there is a critical lack of research applying established behavioral frameworks like the EPPM to understand the psychological determinants of quitting intention. Given that intention to quit is a key predictor of successful cessation, identifying the factors that influence this intention is essential for designing effective, culturally appropriate interventions. Moreover, evaluating the role of health warnings within the context of risk communication can provide valuable insights into how these messages impact users' motivation and behavior change. This study, therefore, addressed an important gap in tobacco control research by combining theoretical rigor with practical implications, with the ultimate aim of generating evidence to inform public health strategies to reduce the burden of hookah smoking in Iran and similar settings.

Methods

Design and participants

This cross-sectional study was conducted among 485 hookah smokers aged 18–59 years in two cities, Kermanshah (western Iran) and Ardabil (northwestern Iran). Data were collected over four months, from May to August 2022. The selection of Kermanshah and Ardabil was based on both practical and epidemiological considerations. Previous studies in these regions reported a relatively high prevalence of hookah use,^{21,22} making

them suitable settings for investigating this behavior. In addition, these provinces are home to major ethnic groups in Iran (Kurds in Kermanshah and Azerbaijani Turks in Ardabil), offering a culturally diverse sample that enhances the generalizability and applicability of the findings. Conducting research across diverse populations can provide deeper insights into culturally embedded beliefs and behaviors, which is crucial for developing effective and tailored public health interventions. Moreover, epidemiological research on adult hookah smoking in Iran remains limited, particularly in these cities and among diverse ethnic groups. This study, therefore, aimed to address this gap by providing data to inform local and national tobacco control strategies. Local accessibility also facilitated data collection in both locations.

Participants were recruited from hookah supply venues such as cafés and hookah bars. Inclusion criteria were being in the age groups of 18 to 59 years, currently using hookah, having at least basic literacy (minimum of five years of schooling), not having a diagnosed psychotic disorders, and providing informed consent. Adolescents under 18 years were excluded for two main reasons. First, ethical guidelines require parental consent for the participation of minors, which complicated the research process. Second, the study sample was drawn from public hookah-serving venues, which are rarely frequented by minors due to legal restrictions and social norms. Therefore, the study naturally focused on adult users of such environments. Individuals with incomplete questionnaires were also excluded from the analysis. After explaining the objectives of the research, participants completed the questionnaire, which took approximately 20 minutes.

Sampling

The cluster sampling method was used in this study. Based on the municipal divisions (eight in Kermanshah and five in Ardabil), three clusters in Kermanshah and two clusters in Ardabil were randomly selected. Within each cluster, participants were randomly chosen at designated hookah supply venues.

The sample size was calculated using standard formulae and based on the results of a previous study.⁵ Assuming a standard deviation of 6.97, a confidence level of 95%, a margin of error (d) of 0.6, and an effect size of 1.2, the initial sample size was estimated to be 642 participants. Based on the population proportions, 374 were allocated to Kermanshah and 250 to Ardabil. In total, 485 individuals completed the study questionnaires, yielding a response rate of approximately 78%.

Measures

Demographic Information Form

This form collected data based on participants' age,

gender, education level, occupation, marital status, socio-economic status, and personal and familial history of hookah use.

EPPM-Based Questionnaire

Adapted from Birmingham et al.,²³ this tool included 21 items covering the EPPM constructs: perceived susceptibility, perceived severity, self-efficacy, response efficacy, fear, defensive motivation, and protective motivation. Each construct was measured using three items, scored based on a 5-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), yielding construct scores from 3 to 15.

Health Warning Labels Questionnaire

Adapted from Hammond et al.,²⁴ this 10-item instrument assessed participants’ perceptions of health warnings, including clarity, emotional impact, and influence on contemplation of quitting hookah. Responses were rated based on a 5-point Likert scale (1 = “strongly disagree” to 5 = “strongly agree”), with total scores ranging from 10 to 50.

The content validity of both the EPPM and health warning labels questionnaires was assessed using content validity ratio (CVR) and content validity index (CVI) through a panel of experts in health education and health promotion, psychology, epidemiology, communication, sociology, and infectious diseases. According to the experts’ opinions, the EPPM questionnaire showed a CVR of 0.90 and CVI of 0.82. The intra-class correlation coefficient (ICC) for test-retest reliability was 0.87, and Cronbach’s alpha for internal consistency of the entire scale was 0.70. The Cronbach’s alpha values for the constructs were 0.71, 0.64, 0.66, 0.54, 0.65, 0.75, and 0.84 for perceived susceptibility, perceived severity, self-efficacy, response efficacy, fear, defensive motivation, and protective motivation, respectively. The health warning questionnaire achieved a CVR of 0.84, CVI of 0.80, and Cronbach’s alpha of 0.78.

Figure 1 illustrates the theoretical framework of the Extended Parallel Process Model (EPPM), showing hypothesized relationships between constructs and

intention to quit hookah smoking.

Statistical analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS-18) and STATA-8. Descriptive statistics (mean $\pm$ SD, frequencies, and percentages) summarized socio-demographic variables. Multiple linear regression was performed to identify predictors of intention to quit hookah smoking, with intention as the dependent variable and EPPM constructs, health warnings, and relevant demographic/contextual characteristics as independent variables. Bivariate regressions were conducted first to examine the individual association of each independent variable with intention. Assumptions for regression were tested and met: (1) independence of observations was confirmed through visual inspection; (2) normality of residuals was assessed using histograms; (3) scatter plots showed a linear relationship between dependent and independent variables; and (4) the Durbin-Watson statistic (DW = 1.964) indicated no significant autocorrelation. Statistical significance was set at $P < 0.05$ with a 95% confidence level.

Results

A total of 485 participants from the youth and adult populations of Kermanshah and Ardabil cities were included in this study. The majority of participants were male (347; 71.5%) and single (343; 70.7%). The largest occupational group was the unemployed (183; 37.7%), and nearly half of the participants had an academic degree (233; 48.1%). The prevalence of hookah use among family members was 39.4%, and 29.5% of participants also reported cigarette smoking. The mean age of participants was 30.24 ± 8.29 years, with an average initiation age of hookah smoking at 20.30 ± 3.48 years. Participants reported smoking hookah on average 7.51 ± 2.89 times per week. As shown in Table 1, no significant differences were observed in demographic variables between participants from Kermanshah and Ardabil cities.

Table 2 reports the means and standard deviations of the EPPM constructs and health warning scores. Defensive motivation had the highest mean score (9.14 ± 2.44),

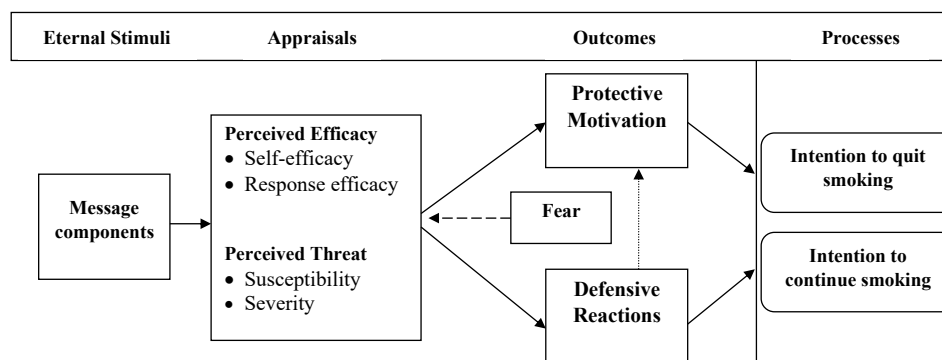


Figure 1. Schematic diagram of the extended parallel process model (Adapted from Witte, 1992)

Table 1. Demographic characteristics in the two cities of Kermanshah and Ardabil

Numerical variables: Mean (SD)		Total	Kermanshah	Ardabil	P-value
Age (years)		31.07 ± 8.66	31.20 ± 8.77	30.90 ± 8.56	0.772
Age of onset of hookah smoking (years)		20.30 ± 3.48	20.20 ± 3.35	20.41 ± 3.66	0.632
Hookah in week (numbers)		7.51 ± 2.89	7.57 ± 2.90	7.44 ± 2.87	0.733
Nominal variables: N (%)					
Gender	Male	347(71.5%)	200(70.9%)	147(72.4%)	0.568
	Female	138(28.5%)	82(29.1%)	56(27.6%)	
Marital status	Single	343(70.7%)	195(69.1%)	138(68.0%)	0.341
	Married	142(29.3%)	87(30.9%)	65(32.0%)	
Education level	Academic	233(48.1%)	145(51.4%)	98(48.3%)	0.368
	Diploma	183(37.7%)	99(35.1%)	74(36.4%)	
	Under diploma	69(14.2%)	38(13.5%)	31(15.3%)	
Hookah in Family	No	294(60.6%)	175(62.1%)	119(58.6%)	0.201
	Yes	191(39.4%)	107(37.9%)	84(41.4%)	
Cigarette smoking	No	342(70.5%)	203(72.0%)	139(68.5%)	0.404
	Yes	143(29.5%)	79(28.0%)	64(31.5%)	
Occupation	Unemployed	183(37.7%)	109(38.6%)	74(36.5%)	0.713
	Self-employed	126(26.0%)	73(25.9%)	53(26.1%)	
	Student	90(18.6%)	52(18.5%)	38(18.7%)	
	Employee	86(17.7%)	48(17.0%)	38(18.7%)	

Table 2. Correlations between the constructs of extended parallel process model and health warning

Structures	Mean (SD)	1	2	3	4	5	6	7	8
1- Intention	7.92 (2.04)	1	.29*	.38*	.37*	.01	.09	-.39*	.50*
2- Susceptibility	8.97 (2.72)	-	1	.66*	.30*	.30*	.10	-.42*	.24*
3- Severity	8.38 (2.36)	-	-	1	.35*	.25*	.08	-.39*	.31*
4- Self-efficacy	7.48 (2.14)	-	-	-	1	.04	.06	-.38*	.35*
5- Response efficacy	8.50 (1.81)	-	-	-	-	1	.13**	-.15**	.04
6- Fear	8.33 (2.77)	-	-	-	-	-	1	.12	.19**
7- Defensive motivation	9.14 (2.44)	-	-	-	-	-	-	1	-.35*
8- Health warning	22.87 (5.68)								1

Significant at $P < 0.001$.** Significant at $P < 0.05$.

while self-efficacy had the lowest (7.48 ± 2.14). The mean score of health warning was 22.87 ± 5.68 . Correlation analyses (Table 2) revealed that defensive motivation was significantly and inversely associated with intention to quit hookah ($r = -0.39$, $P < 0.001$), suggesting that greater defensive responses were linked to lower quit intentions. In contrast, health warning was positively correlated with intention ($r = 0.50$, $P < 0.001$). Other EPPM constructs, except fear and response efficacy, also demonstrated significant correlations with intention.

Table 3 presents the results of the regression models. In the first model, which included EPPM constructs and demographic variables, the coefficient of determination (R^2) was 0.266, with an adjusted R^2 of 0.254. The overall model was statistically significant ($F = 22.540$, $P < 0.001$), explaining approximately 25% of the variance in intention

to quit hookah. Defensive motivation, perceived severity, self-efficacy, and age emerged as significant predictors. In contrast, gender, marital status, occupational status, education level, perceived susceptibility, response efficacy, and fear were not significant.

In the second (final) regression model, a health warning was added as an independent variable. As shown in Table 3, health warning emerged as the strongest predictor of intention to quit hookah ($\beta = 0.359$, $P < 0.001$). Among the EPPM constructs, defensive motivation ($\beta = -0.142$, $P = 0.016$), perceived severity ($\beta = 0.128$, $P = 0.032$), and self-efficacy ($\beta = 0.139$, $P = 0.016$) remained significant predictors, while perceived susceptibility, response efficacy, and fear were not again significant. Regarding demographic factors, age was the only significant predictor ($\beta = 0.140$, $P = 0.009$), indicating that older

Table 3. Multiple linear regression demonstrating predictors of intention to quit hookah

Independent variable		Model 1		Model 2	
		(β)	P-value	(β)	P-value
Age		0.117	0.041	0.140	0.009
Gender	Female	Ref*			
	Male	-0.002	0.977	-0.002	0.979
Marital status	Single	Ref			
	Married	0.012	0.854	0.018	0.744
Education level	Under diploma	Ref			
	Diploma	0.031	0.596	0.065	0.112
	Academic	0.064	0.237	0.091	0.059
Occupation	Unemployed	Ref			
	Employee	0.068	0.209	0.008	0.875
	Self-employed	0.019	0.736	0.048	0.345
	Student	0.013	0.812	0.022	0.545
Hookah in the family	Yes	Ref			
	No	0.008	0.903	0.007	0.916
Age of onset of hookah		0.015	0.809	0.001	0.991
Perceived Susceptibility		0.034	0.585	0.032	0.617
Perceived Severity		0.191	0.003	0.128	0.032
Self-efficacy		0.218	0.001	0.139	0.016
Response efficacy		-0.112	0.078	0.068	0.285
Fear		0.102	0.106	0.095	0.135
Defensive motivation		-0.216	0.001	-0.142	0.016
Health warning		-	-	0.359	<0.001
Prob>F		0.001		0.001	
R-squared		0.266		0.368	
Adj R-squared		0.254		0.356	

Ref*: Reference group (baseline category).

participants were more likely to intend to quit hookah. Other demographic factors did not significantly predict intention.

This final model showed improved predictability ($R^2=0.368$ and adjusted $R^2=0.356$), which was statistically significant ($F=28.924$, $P<0.001$). Overall, it explained about 36% of the variance in intention to quit hookah based on health warnings, defensive motivation, perceived severity, self-efficacy, and age.

Discussion

This study explored key factors influencing the intention to quit hookah smoking among adult users from two culturally and ethnically distinct cities in Iran, Kermanshah and Ardabil. By examining demographic characteristics, constructs of the EPPM, and the impact of health warnings, our findings provided valuable insights into the psychological and contextual determinants of cessation intention in a region with limited epidemiological data on hookah use. The results showed that health warning, defensive motivation, perceived severity, self-efficacy, and age were significant predictors of intention to quit

hookah.

The health warning emerged as the strongest predictor of intention to quit hookah, reinforcing the critical role of risk communication in tobacco control. Consistent with prior research, health warnings serve as one of the most direct and visible channels through which smokers receive information about health risks, effectively increasing awareness and influencing behavior change.²⁵ In the context of hookah smoking, risk perception is often obscured by cultural norms and misinformation, such as the widespread belief that water filtration and fruit flavorings make hookah smoke less harmful than cigarette smoke.²⁶ Systematic reviews have documented that graphic and textual warnings on tobacco products raise risk perception and quitting motivation across diverse populations.^{25,27,28} These misconceptions reduce perceived susceptibility and severity, undermining cessation efforts¹⁹. Our results highlighted that well-designed health warnings can play a pivotal role in correcting such false beliefs, enhancing perceived severity, and motivating quitting.

Perceived severity, a fundamental dimension of

risk perception, was another significant predictor of quitting intention. This finding aligns with fear appeal theories, which suggest that messages emphasizing the seriousness of potential harm can effectively prompt protective behaviors when combined with sufficient efficacy messages.¹⁶ Exposure to graphic health warnings that highlight severe consequences of tobacco use, such as respiratory and cardiovascular diseases, can increase smokers' perceived severity and ultimately their motivation to quit.²⁹ The interplay between cognitive and emotional components of risk perception further explains how individuals integrate knowledge and feelings when evaluating the threat of hookah smoking.³⁰

Self-efficacy also emerged as an important predictor of quitting intention, defined as an individual's confidence in their ability to perform a behavior with or without assistance.³¹ The literature demonstrates that low self-efficacy is a strong predictor of hookah smoking initiation and continuation, whereas high self-efficacy is a crucial personal factor for cessation.³² Individuals with higher self-efficacy are more likely to quit hookah smoking, while those with lower self-efficacy are at greater risk of initiating use.³³

A critical aspect of self-efficacy is the ability to resist the temptation to smoke hookah in challenging situations, such as social gatherings or peer pressure. A qualitative study in Iran found that poor self-efficacy contributes to continued hookah use, especially in difficult circumstances.³⁴ Similarly, another qualitative study found that participants felt unable to resist hookah when in group settings, indicating low self-efficacy under social pressure.³⁵ Numerous studies further confirmed that behavioral control and self-efficacy are among the most important predictors of smoking cessation.^{36,37}

Defensive motivation, reflecting psychological resistance to threatening health messages, was inversely associated with quitting intention. Defensive responses, including denial, minimization of risk, or avoidance of health information, serve as barriers that reduce the effectiveness of risk communication.^{38,39} Our findings echoed qualitative research showing that many hookah smokers downplay health risks or emphasize the social and pleasurable aspects of hookah use.^{34,35} Furthermore, misconceptions such as believing toxins are filtered by water or that hookah smoking is less addictive further reinforce defensive rationalizations.^{40,41} These defense mechanisms are likely reinforced by strong nicotine dependence and social acceptance, consistent with the "hardening hypothesis," which posits that addicted smokers become increasingly resistant to quitting messages.⁴² Tobacco industry marketing exacerbates these defenses by promoting flavored tobacco products with misleading claims of reduced harm, complicating cessation efforts.^{43,44} Public health campaigns should therefore strategically design messages that reduce

defensiveness by combining threat information with efficacy-enhancing content, emphasizing both the dangers and individuals' capacity to quit.

Age was positively associated with intention to quit, indicating that older adults tended to have stronger motivation, possibly due to accumulated health concerns and personal experience with tobacco-related illnesses.³⁴ Younger adults, in contrast, demonstrated lower quit intentions, highlighting a critical window for intervention to prevent the establishment of long-term addiction.⁴⁵ Targeted prevention and cessation programs that address the specific motivations and barriers of youth are urgently needed, given the rising popularity of hookah smoking among younger populations.

Strengths and Limitations

This study has several limitations that should be acknowledged. First, it was conducted only in two cities of Iran, Kermanshah and Ardabil, representing distinct ethnic groups (Kurdish and Azeri Turk, respectively). While this diversity enhances the cultural relevance of the findings, the results may not be generalizable to other provinces or ethnic populations across Iran. Although demographic and background variables were analyzed separately across the two locations and no significant differences were observed, future studies with larger sample sizes could further explore potential regional or ethnic variations. Second, the sampling strategy relied exclusively on recruiting participants from hookah supply venues, which may exclude individuals who primarily smoke at home or in private settings, thereby influencing the representativeness of the sample. Third, gender imbalance was evident due to lower participation of women, likely reflecting cultural factors, which may limit the generalizability of findings across genders. Additionally, the cross-sectional design restricts causal inference, and the reliance on self-reported data introduces potential biases such as underreporting or social desirability. Finally, some subscales of the EPPM questionnaire, such as response efficacy ($\alpha=0.54$), showed lower internal consistency, which may weaken the construct validity of these measures. Despite these limitations, the present study contributes valuable insights into factors associated with intention to quit hookah in an adult sample from western and northwestern Iran.

Conclusion

This study highlights the crucial role of health warnings as the strongest predictor of intention to quit hookah smoking among adult users in two culturally distinct Iranian cities. By effectively increasing risk awareness and correcting common misconceptions about hookah, well-designed health warnings can significantly enhance motivation to quit. Additionally, psychological factors such as perceived severity of health consequences and self-efficacy in

quitting emerged as important determinants of cessation intention, underscoring the need for interventions that not only raise awareness but also empower individuals to overcome challenges associated with quitting.

The findings also revealed that defensive motivation acts as a significant barrier to cessation, indicating that some hookah smokers resist quitting messages through denial or minimization of risks. Addressing these defensive responses through carefully crafted, culturally sensitive communication strategies is vital for increasing the effectiveness of tobacco control efforts.

Furthermore, the positive association between age and quit intention suggests that older adults, likely more affected by health issues, are more motivated to quit. This highlights the urgent need for targeted interventions focusing on younger populations to prevent long-term addiction and reduce the rising prevalence of hookah smoking among youth.

Given that this study was conducted in only two cities with distinct ethnic groups, caution should be exercised when generalizing the results to broader Iranian or international populations. Nonetheless, the findings provide a valuable foundation for designing tailored public health programs aimed at increasing cessation rates.

Overall, this research emphasizes the importance of comprehensive risk communication strategies that integrate strong health warnings, address psychological barriers, and support self-efficacy to effectively promote hookah cessation among diverse adult populations.

Implications and Recommendations

Policymakers and public health practitioners should prioritize the design and implementation of culturally sensitive, evidence-based health warning labels on hookah products that directly address common misconceptions, such as the belief that hookah is less harmful than cigarettes. Risk communication programs should carefully balance threat information with efficacy-enhancing messages to reduce defensive reactions and strengthen individuals' confidence in their ability to quit.

Special attention should be directed toward youth and young adults, who showed lower intentions to quit and may be most vulnerable to long-term addiction. School- and community-based prevention campaigns, combined with early cessation support programs, are recommended to reduce initiation and encourage quitting at earlier ages. Tailored interventions that address cultural differences and gender-specific barriers could further increase program effectiveness.

Healthcare providers also play a crucial role in cessation efforts and should be trained to deliver clear, nonjudgmental advice and counseling to hookah users. Expanding access to cessation services, including counseling, training, and pharmacological support where

appropriate, can help enhance self-efficacy and sustain quitting attempts.

From a research perspective, longitudinal and interventional studies are needed to establish causality and to evaluate the effectiveness of specific communication strategies in reducing hookah use. Future investigations should also explore underrepresented populations, including women and home-based smokers, to provide a more comprehensive understanding of hookah use dynamics and cessation determinants across diverse groups.

Together, these recommendations highlight the importance of integrating strong health warnings, culturally grounded risk communication, and supportive cessation services within a national tobacco control strategy aimed at reducing the rising prevalence of hookah smoking.

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Authors' Contribution

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Competing Interests

The authors declared no conflict of interest.

Ethical Approval

The authors confirm that all methods related to the human participants were performed in accordance with the Declaration of Helsinki. This study also received ethics approval from the Research Ethics Committee of Kermanshah University of Medical Sciences (Ethical code: IR.KUMS.REC.1398.350) and Ardabil University of Medical Sciences (Ethical code: IR.ARUMS.REC.1398.319). Written informed consent form was obtained from all participants.

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