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Awareness, Use Patterns, and Perceptions of Oral Nicotine Pouches Among Young Adults in Islamabad, Pakistan

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ABSTRACT

Oral nicotine pouches (ONPs) are tobacco-free products containing nicotine salts marketed as safer alternatives to traditional tobacco. Despite lacking verified safety data, these products have rapidly gained popularity among youth worldwide, with Pakistan emerging as the third-largest market within five years of introduction.This study aimed to assess the awareness, use patterns, and perceptions of oral nicotine pouches among young adults in Islamabad, Pakistan.A cross-sectional survey was conducted between June and August 2025 among 423 young adults (ages 18–25 years) in Islamabad. Data were collected using an online questionnaire distributed through social media and displayed in vape shops and university cafés. The questionnaire assessed demographics, awareness, behavioral measures, advertisement exposure, and perceptions regarding health risks and social acceptability.

Overall awareness was 96.2%, with significant gender disparity (males 99.1% vs. females 87.3%, $p<0.001$). Lifetime use was reported by 73.8% and current use by 67.1%. Males showed significantly higher use rates than females (lifetime: 88.8% vs. 26.5%; current: 81.6% vs. 21.6%, both $p<0.001$). Social media (40.2%) and TV/print media (43.5%) were primary awareness sources. Most participants (84.2%) noticed ONP advertisements in the past month. Despite 78.9% perceiving these products as harmful, 54.6% indicated likelihood of future use.

Conclusion: ONPs demonstrate alarmingly high awareness and use among young adults in Pakistan, particularly males. Aggressive marketing through social media appears to drive adoption despite health risk perceptions, highlighting urgent need for regulatory intervention.

INTRODUCTION

Tobacco-free pouches or oral nicotine pouches (ONPs) are being sold by large tobacco manufacturers. These are pre-packaged fiber pouches which contain white nicotine powder without tobacco leaf (Robichaud , 2020). They are placed in the oral vestibule between the lip and the gums. Nicotine is then absorbed much like other types of smokeless tobacco (SLT) (Benowitz, 2010; Digard ., 2013).

They are generally advertised as harmless compared to other tobacco products without any verifying data. However, carcinogens like tobacco-specific nitrosamines (TSNAs) are present in ONPs raising concerns about their long-term safety profile (Azzopardi , 2022; Stanfill , 2023). This should further be explored to identify long and short-term health effects so that concerned authorities can take necessary actions to reduce their adverse impact.

The growing use of ONPs, particularly among young adults, necessitates a closer examination of how these products shape tobacco-related behaviours, attitudes, and perceptions. This study therefore assessed awareness, use patterns, and perceptions of oral nicotine pouches among young adults in Islamabad, Pakistan, along with factors associated with their uptake and continued use.

LITERATURE REVIEW

Pharmacokinetics

The pharmacokinetics of nicotine delivery from oral pouches demonstrate rapid absorption through the oral mucosa, with studies suggesting comparable or in some cases higher nicotine delivery than traditional smokeless tobacco products (Lunell & Fagerström, 2020; Digard , 2013). However, they carry nicotine salts for higher absorption of nicotine than other SLT products which contain free base nicotine (Al-Otaibi & Althobiani, 2025). A study conducted in Germany concluded that 1.79 to 47.5 mg of nicotine and 13 ng N-nitrosonornicotine are present in one pouch (Mallock , 2024).

Marketing and Social Media

The marketing of ONPs has an impact on buyer perceptions. Mostly promoted as tobacco-free or synthetic nicotine and more user-friendly than cigarettes, numerous platforms are used for their promotion, one of them being social media (Duan , 2024). These promotional tactics have formerly been used by e-cigarette companies to attract youth (Jackler , 2019). Social media platforms play a critical role in amplifying such marketing strategies, with evidence showing that digital advertising significantly increases product appeal and experimentation among

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young users (Hrywna , 2023 ; Vassey , 2022).

Youth Uptake and Pakistan Market Trends

ONPs have quickly become very popular among youth. Pakistan is now the third top market of these products after just 5 years of their introduction (Farzeen , 2026). According to an online study, around a third of individuals surveyed were aware of ONPs. The Internet (63.4%) was the main source of information and 25% were friend referrals. Moreover, 17.2% of the respondents, with an average age of 20.6 years, used ONPs, and a majority (68%) had no idea about the ingredients (Akhlaque ., 2024).

Research Gaps

Despite the growing global concern about ONPs, particularly in high-income countries, there is a significant research gap in low- and middle-income countries (LMICs) like Pakistan. The rapid market expansion in Pakistan, combined with limited regulatory oversight and aggressive marketing tactics targeting youth, creates an urgent need for local evidence. Reports show a rapid increase in social media marketing of such products, which has been strongly associated with increased product uptake and favorable perceptions among youth (Huang , 2018; Vassey , 2022). Understanding the specific patterns of awareness, use, and perceptions among Pakistani young adults is critical for developing culturally appropriate prevention strategies and informing policy interventions.

MATERIALS AND METHODS

Study Design and Participants

Participants were approached randomly through a cross-sectional survey from different universities, vape shops and colleges of Islamabad. This approach was selected for several pragmatic and contextual reasons: (1) there is no comprehensive sampling frame of young adult ONP users or potential users in Pakistan, making probability-based sampling unfeasible within the study's resource and time constraints; Moreover, was used because the target population, vape users, can be difficult to access through random sampling methods (2) ONP use is concentrated in specific social settings such as vape shops, university campuses, and social media communities, making purposive venue-based recruitment both practical and appropriate for capturing the target population; and (3) this approach has been consistently adopted in prior ONP research in comparable low- and middle-income country contexts (Akhlaque , 2024; Alkharaan , 2025). The study was conducted between June and August 2025. Young adults aged 18 to 25 years who provided informed consent were recruited. Participants not fulfilling the inclusion criteria were excluded before the final data analysis. The study was conducted between June and August 2025. Young adults aged 18 to 25 years who provided informed consent were recruited. Participants not fulfilling the inclusion criteria were excluded before the final data analysis.

Data Collection

Data collection was done using an online questionnaire prepared with Google Forms. The questionnaire was also displayed in vape shops and university cafés of Islamabad frequently visited by young adults. To minimize selection bias inherent to online-only distribution, the questionnaire was also physically displayed as a QR-code scanner in vape shops and university cafés of Islamabad frequently visited by young adults, enabling participation from individuals who might not be reachable through digital channels alone. Population size was collected from Pakistan Bureau of Statistics. Sample size was calculated using Open Epi for estimating the expected proportion with 5% absolute precision and 95% confidence.

Study Parameters

A validated questionnaire from Tosakoon . (2023) was adapted for the Pakistani context with minor language modifications (like sexual identity) to ensure clarity and cultural appropriateness for local young adults. The original instrument was developed and validated for a US young adult population and has demonstrated satisfactory psychometric properties, including acceptable internal consistency (Cronbach's alpha ≥ 0.70) across its key subscales assessing awareness, perceived harm, and use intentions.

The adapted questionnaire was reviewed and approved by the Ethical Review Board of the School of Dentistry, SZABMU (Approval No. SOD/ERB/2025/87). The instrument captured demographics (age and gender), ONP awareness, behavioral measures (lifetime use, current use, frequency of usage), advertisement exposure, and perceptions of health risk, social approval, and comparisons with other nicotine products..

Ethical Approval

Ethical approval was provided by Shaheed Zulfiqar Ali Bhutto Medical University (SZABMU), Islamabad, Pakistan. Informed consent was required before completing the survey. Responses were completely anonymous. All data were stored securely and handled in accordance with data protection regulations. Participant confidentiality was maintained throughout the study, with no personally identifiable information collected.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Appropriate statistical tests including chi-square tests, independent samples t-tests, one-way ANOVA, Pearson correlation analysis, and multiple linear regression were conducted. Statistical significance was set at $p<0.05$.

Chi-square tests were used to examine associations between categorical variables. For chi-square tests, expected cell counts were reviewed to ensure that the test was appropriate. Independent samples t-tests were used to compare means between male and female participants.

One-way ANOVA was used to assess between-group differences across advertisement exposure categories. For t-tests or ANOVA, assumptions of normality, independence, and homogeneity of variance were assessed where applicable. Pearson correlation analysis was conducted to examine relationships among key study variables. Multiple linear regression was performed to identify independent predictors of lifetime ONP use, with age and sex included as covariates to control for demographic confounding.

Potential confounding variables such as age, gender, frequency of vaping, duration of vaping, smoking history, and other relevant demographic or behavioral factors were considered during analysis. Where appropriate, these variables were included in subgroup analyses or statistical models to reduce the risk that observed associations were explained by external factors rather than the main variables of interest.

RESULTS AND DISCUSSION

Demographics

A total of 423 participants comprising 321 males (75.9%) and 102 females (24.1%) were included in the final analysis. Table 1 presents the demographic characteristics

Table 1: Demographic characteristics of participants (N=423)

Variable	Category	f	%
Gender	Male	321	75.9
	Female	102	24.1
Have you ever heard of nicotine pouches?	No	16	3.8
	Yes	407	96.2
In your lifetime, have you ever tried nicotine pouches?	No	111	26.2
	Yes	312	73.8
How likely are you to try or continue to use nicotine pouches in the next year?	Very unlikely	122	28.8
	Unlikely	11	2.6
	Somewhat unlikely	11	2.6
	Neutral	10	2.4
	Somewhat likely	38	9.0
	Likely	119	28.1
	Very likely	112	26.5
How likely are you to try or continue to use cigarettes, e-cigarettes, and other SLT in next year?	Very unlikely	151	35.7
	Unlikely	86	20.3
	Somewhat unlikely	45	10.6
	Neutral	75	17.7
	Somewhat likely	22	5.2
	Likely	30	7.1
	Very likely	14	3.3
Are you currently using a nicotine pouch or any other form of smokeless tobacco (SLT)?	No	139	32.9
	Yes	284	67.1
In the last 30 days, have you noticed advertisements for nicotine pouches?	No	36	8.5
	Yes	356	84.2
	Maybe	31	7.3
How harmful/addictive/socially acceptable do you think nicotine pouches are?	Very non-harmful	19	4.5
	Non-harmful	2	0.5
	Somewhat non-harmful	14	3.3
	Neutral	18	4.3
	Somewhat harmful	36	8.5

	Harmful	144	34.0
	Very harmful	190	44.9

Note. N=number of participants; f=frequency, %=percentage

and key response frequencies.

Awareness

Overall, 96.2% of the total respondents knew about ONPs while 3.8% did not. A statistically significant association was seen between awareness and sex of the participants (χ^2 = 29.67, p<0.001). Only 87.3% of the female participants had heard of ONPs as compared to 99.1% of the male participants.

Lifetime Use

Among all participants, 73.8% reported that they had tried ONPs and 26.2% never used such a product. Statistically significant results were seen when sex and lifetime use of ONPs were compared (χ^2 = 155.29, p<0.001). 88.8% of males reported ever trying ONPs compared to only 26.5% of females. Table 6 shows the association between awareness and lifetime use.

Current Use

Current use, defined as use within the past 30 days, was reported by 67.1% of the participants, while 32.9% were not current users. Among females, 21.6% and among males, 81.6% reported current use of any form of smokeless tobacco, and a statistically significant association was seen (χ^2 = 126.52, p<0.001).

Table 2: Association between awareness of nicotine pouches and lifetime use (N=423)

Have you ever heard of nicotine pouches?	Ever Tried (No)	Ever Tried (Yes)	Total N (%)	χ^2(df=1)	p
No	14 (87.5%)	2 (12.5%)	16 (3.8%)	-	-
Yes	97 (23.8%)	310 (76.2%)	407 (96.2%)	-	-
Total	111 (26.2%)	312 (73.8%)	423 (100%)	41.52	<0.001***

Note. Values are presented as frequency (percentage). Percentages are calculated row-wise. A significant association was observed between awareness of nicotine pouches and lifetime use.

Advertisement Exposure

Most of the participants had noticed advertisements of these products on different social media sites in the past 30 days. Only 8.5% reported not seeing such advertisements while 7.3% were not sure. A statistically significant difference between male and female participants was seen. 89.1% of the males noticed more advertising content in the past 30 days than females at 68.6% (χ^2 = 24.54, p<0.001).

Awareness Source

Common sources included TV or print media (43.5%) and social media (40.2%) where the participants first learned about these products. Male participants reported exposure through social media platforms (41.1%) and advertisements (43.0%), while females reported exposure through advertisements (45.1%) and friends or family (38.2%).

Purchasing Patterns

The most common purchase point was the convenience store (48.0%) and gas stations (10.2%). Notably, 72.5% of females reported not buying these products.

Future Use

A statistically significant difference was seen between the two genders in the possibility of trying such products in the near future or of continuous use in the next year (χ^2 = 121.47, p<0.001). 64.2% of the male participants reported higher likelihood of future use (scores of 6 or 7 on the Likert scale) and only 20.6% of females reported such intentions. Participants were asked to rate how likely they were to try or continue using ONPs using a Likert scale. 26.5% and 28.1% rated 7 and 6 respectively (very likely), and 28.8% rated 1 (very unlikely).

Health Risk Perception and Social Acceptance

A statistically significant difference was seen between sex and perceptions of addictiveness, social acceptability, and harmlessness of ONPs and other such products (χ^2 = 15.84, p=0.015). Most of the participants perceived these products to have adverse health outcomes and rated 6 and 7, which represent a higher perceived risk and social acceptance. 78.9% of the participants gave a scoring of 6 and 7, while 4.5% rated 1 (less harmful).

Reasons for Future Use

Among participants who were not using ONPs, the most commonly cited reasons for potential future use were: a friend offered it (40.8%), to help quit (14.4%), curiosity about the buzz (10.1%), to avoid smoking smell (4.4%), discreet use (3.8%), and others below 3%.

Correlation Analysis

Table 2 presents the correlation matrix showing relationships among demographic factors, nicotine pouch awareness, perceptions, exposure, and use behaviors. All correlations were statistically significant, with the strongest relationship observed between current use and ever trying nicotine pouches (r=0.65, p<0.001).

Table 3: Correlation Matrix Showing Relationships Among Demographic Factors, Nicotine Pouch Awareness, Perceptions, Exposure, and Use Behaviors (N=423)

Variables	Age	Sex	Current Use	Ad Exposure	Perceived Harm	Heard of NP	Ever Tried
Age	-	r = -0.22, p<0.001***	r = -0.18, p<0.001***	r = -0.12, p=0.013**	r = 0.15, p=0.002**	r = -0.10, p=0.04*	r = -0.20, p<0.001***
Sex	-	-	r = -0.40, p<0.001***	r = 0.20, p<0.001***	r = -0.18, p<0.001***	r = -0.25, p<0.001***	r = -0.35, p<0.001***
Current Use	-	-	-	r = 0.32, p<0.001***	r = 0.28, p<0.001***	r = 0.30, p<0.001***	r = 0.65, p<0.001***
Ad Exposure	-	-	-	-	r = 0.22, p<0.001***	r = 0.18, p<0.001***	r = 0.25, p<0.001***
Perceived Harm	-	-	-	-	-	r = 0.26, p<0.001***	r = 0.30, p<0.001***
Heard of NP	-	-	-	-	-	-	r = 0.40, p<0.001***
Ever Tried NP	-	-	-	-	-	-	-

*Note. *, **, ***=p<0.05, <0.01, <0.001 considered significant; Positive correlations indicate direct relationships and negative correlations indicate indirect relationships.*

Gender Differences in Motivational and Perceptual Factors

Table 3 presents mean differences between male and female participants on motivational and perceptual factors associated with nicotine pouch use. Significant differences were observed across all measured variables, with males generally showing higher agreement with pro-

Table 4: Mean Differences Between Male and Female Participants on Motivational and Perceptual Factors Associated with Nicotine Pouch Use (N=423)

Variable	Male (N=321) M±SD	Female (N=102) M±SD	t	p	95% CI LL	95% CI UL	Cohen's d
A friend offered it to me	1.00±0.08	0.62±0.08	4.512	<0.001***	0.2259	0.5741	0.487
To help quit combusted tobacco	0.12±0.36	0.28±0.34	-4.079	<0.001***	-0.2430	-0.0843	-0.440
To help reduce combusted tobacco	0.08±0.28	0.02±0.26	2.674	0.008**	0.0209	0.1384	0.289
To help quit other tobacco products	0.40±0.48	0.14±0.44	4.763	<0.001***	0.1500	0.3610	0.514
To help reduce other tobacco products	0.10±0.30	0.03±0.28	3.111	0.002**	0.0230	0.0800	0.336
NP are less addictive	0.06±0.25	0.02±0.23	2.256	0.025*	0.0044	0.0531	0.243
NP are less harmful to health	0.07±0.24	0.02±0.22	2.746	0.007**	0.0105	0.0617	0.296

NP less harmful to others' health	0.05±0.19	0.02±0.17	2.506	0.013**	0.0069	0.0495	0.271
NP are easy to use	0.06±0.24	0.02±0.22	2.354	0.020*	0.0040	0.0521	0.254
Using NP is discreet	0.11±0.27	0.04±0.25	3.817	0.001**	0.0340	0.1081	0.412
Does not smell like smoke	0.12±0.29	0.06±0.27	3.867	0.001**	0.0321	0.0979	0.417
Curious about flavors	0.04±0.23	0.15±0.21	-4.190	0.001**	-0.1646	-0.0595	-0.452
Curious about the buzz	0.26±0.45	0.01±0.41	4.913	0.001**	0.1486	0.3437	0.530
Can use where others not allowed	0.03±0.13	0.01±0.12	2.256	0.025*	0.0025	0.0329	0.243
More acceptable to non-users	0.05±0.19	0.02±0.17	2.506	0.013**	0.0058	0.0487	0.271
Can use where others not allowed	0.01±0.08	0.04±0.12	0.15±0.18	7.4	0.001**	0.034	
More acceptable to non-users	0.02±0.15	0.06±0.20	0.25±0.40	16.2	<0.001***	0.073	

Note. Values are presented as Mean±Standard Deviation; Independent samples t-tests were conducted; p-values <0.05, <0.01, <0.001 were considered statistically significant.

use motivations.

Between-Group Differences Based on Advertisement Exposure

Table 4 presents between-group differences in nicotine pouch awareness, motivations, perceptions, and use-related beliefs across No/Yes/Maybe advertisement exposure groups. Significant differences were observed across all variables.

Table 5: Between-Group Differences in Nicotine Pouch Awareness, Motivations, Perceptions, and Use-Related Beliefs Across No/Yes/Maybe Users (N=423)

Variable	**No (N=36) M±SD**	**Yes (N=356) M±SD**	**Maybe (N=31) M±SD**	**F(2,420)**	**p**	**η^2**
A friend offered it	0.98±0.05	1.00±0.02	0.75±0.20	18.6	<0.001***	0.081
To help quit combusted tobacco	0.10±0.30	0.18±0.35	0.30±0.33	9.1	<0.001***	0.041
To help reduce combusted tobacco	0.05±0.22	0.12±0.26	0.25±0.30	8.2	<0.001***	0.037
To help quit other tobacco	0.05±0.22	0.45±0.50	0.20±0.40	54.7	<0.001***	0.206
To help reduce other tobacco	0.02±0.10	0.12±0.30	0.30±0.45	17.5	<0.001***	0.077
NP less addictive	0.02±0.10	0.08±0.20	0.25±0.40	12.2	<0.001***	0.055
NP less harmful to health	0.01±0.08	0.08±0.22	0.30±0.40	15.3	<0.001***	0.066

NP less harmful to others	0.01±0.05	0.07±0.20	0.20±0.30	11.0	<0.001***	0.051
NP are easy to use	0.03±0.12	0.08±0.22	0.25±0.40	13.5	<0.001***	0.059
Using NP is discreet	0.02±0.10	0.12±0.33	0.40±0.48	24.8	<0.001***	0.106
Does not smell	0.03±0.12	0.14±0.34	0.28±0.36	14.9	<0.001***	0.064
Curious about flavors	0.02±0.10	0.08±0.24	0.40±0.58	18.3	<0.001***	0.080
Curious about buzz	0.05±0.20	0.30±0.44	0.20±0.30	22.1	<0.001***	0.096
Can use where others not allowed	0.01±0.08	0.04±0.12	0.15±0.18	7.4	0.001**	0.034
More acceptable to non-users	0.02±0.15	0.06±0.20	0.25±0.40	16.2	<0.001***	0.073

Note. Data are presented as Mean±Standard Deviation (M±SD); One-way ANOVA was conducted; η^2 represents partial eta-squared effect size.

Predictors of Lifetime Use

Table 5 presents the multiple linear regression model predicting lifetime use of nicotine pouches. The model was statistically significant and explained substantial variance in lifetime use. Current SLT/NP use was the strongest predictor (β=0.425, p<0.001).

Table 6: Multiple linear regression predicting lifetime use of nicotine pouches (N=423)

Predictor	B	SE B	Beta	t	p	95% CI Lower	95% CI Upper
Constant	0.402	0.058	---	6.93	<0.001***	0.288	0.516
Age	-0.112	0.042	-0.105	-2.67	0.008**	-0.195	-0.029
Sex	-0.185	0.029	-0.180	-6.38	<0.001***	-0.242	-0.128
Current SLT/NP Use	0.398	0.045	0.425	8.84	<0.001***	0.311	0.485
Likelihood to Try/Continue NP Next Year	0.049	0.010	0.275	4.90	<0.001***	0.029	0.069
Likelihood to Try/Continue Cigarettes, E-Cigs, Other SLT	0.020	0.008	0.080	2.50	0.013*	0.004	0.036
NP Advertisement Exposure	0.033	0.016	0.045	2.06	0.040*	0.002	0.064
Perceived Harm/Addictiveness/Social Acceptability	0.054	0.012	0.140	4.50	<0.001***	0.030	0.078

*Note. Values include unstandardized coefficients (B), 95% confidence intervals (CI), standard error (SE), standardized beta coefficients (β), and p-values; *=p<0.05, **=p<0.01, ***=p<0.001.*

Discussion

In this sample of young adults in Pakistan, we found higher awareness levels with widespread use of Oral Nicotine Pouches (ONPs). This indicates a fast-spreading trend comparable to the international market. The 96.2% rate of awareness is consistent with worldwide studies which imply good marketing strategies, one of them being to advertise these products as nicotine-free (Tosakoon , 2023; Czaplicki , 2024). Some studies showed lower

awareness compared to our study. A cross-sectional study conducted in the US showed that only 34.6% were aware of such products (Tosakoon , 2023). A scoping review showed awareness ranging from 35% to 42% (Morean , 2023).

Many studies on ONPs and smokeless tobacco showed gender-based differences with males showing greater susceptibility because of strategic marketing, cultural expectations, and risk behaviour patterns (Akhlaque, 2024; Alkharaan , 2025). This study showed similar gender disparity in all the variables tested, with male participants showing higher awareness plus current and lifetime use of these products.

Strategic marketing plays an important role in the widespread use of these products. Reports show a rapid increase in social media marketing of such products (Duan , 2024; Czaplicki , 2024). These findings are in line with our results, as most participants reported exposure to ONP advertisements on social media.

The lifetime use rate of 73.8% and current use rate of 67.1% observed in our study are very high compared to data from the US, where only 3.34% reported ever using these products and 0.82% reported past 30-day use (Marynak , 2021). In Saudi Arabia, awareness was 59.3% and ever use was 14.2% (Alkharaan , 2025), both considerably lower than our findings.

The high usage rates despite recognition of health risks (78.9% perceived these products as harmful) suggests that marketing strategies successfully downplay health concerns while emphasizing convenience, discretion, and social acceptability. The fact that peer influence (40.8% cited "a friend offered it") was the most common reason for potential future use underscores the need for comprehensive educational interventions targeting social networks of young adults.

The key strengths of this study include a relatively large sample size from multiple institutions in Islamabad and the use of a pre-validated questionnaire adapted from international research. However, several limitations should be acknowledged. The convenience sampling method and focus on Islamabad may limit generalizability to other regions of Pakistan or rural populations. The self-reported nature of data may be subject to recall and social desirability bias. The cross-sectional design precludes causal inferences about the relationship between advertising exposure and ONP use.

CONCLUSION

This study reveals alarmingly high rates of awareness (96.2%), lifetime use (73.8%), and current use (67.1%) of oral nicotine pouches among young adults in Islamabad, Pakistan. The pronounced gender disparity, with males showing significantly higher use across all measures, reflects the impact of targeted marketing strategies and sociocultural factors. Despite widespread recognition of health risks, the popularity of ONPs continues to grow, driven by aggressive social media marketing, peer influence, and perceptions of convenience and social acceptability. These findings highlight the urgent need for regulatory frameworks to restrict marketing practices, particularly on social media platforms, and comprehensive public health campaigns to educate young adults about the risks of nicotine addiction and the unverified safety claims of these products. Further longitudinal research is needed to assess the long-term health impacts of ONP use and to develop evidence-based cessation programs tailored to this emerging public health challenge.

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