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Patterns, Predictors, and Expenditure Associated with Tobacco Use among Rural Adults in Jharkhand: A Cross-Sectional Study

Running Title: Patterns, Predictors and Expenditure of Tobacco Use in Rural Jharkhand

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ABSTRACT:

Background: Jharkhand carries one of India's highest tobacco burdens, yet little is known about what rural users consume, what sustains their use and what it costs them.

Objectives: To describe the forms, frequency, age at initiation and duration of tobacco use, and to assess domain-based predictors and expenditure among current tobacco users.

Methods: A community-based cross-sectional study was conducted among 212 adults aged more than 15 years in the rural field practice area of the Rural Health Training Centre, RIMS, Ranchi. The current tobacco users were assessed for the mode, frequency and form of use, age at initiation, duration of use and expenditure; eight behavioural predictor domains were scored from 0 to 1.

Results: Of 212 participants, 94 (44.3%) were current tobacco users. Smokeless tobacco predominated: 85 (90.4%) used it daily, whereas 36 (38.3%) smoked, only 11 (11.7%) daily. Khaini was the commonest product, used daily by 50 (53.3%). Exclusive smokeless use (61.7%), dual use (28.7%) and exclusive smoking (9.6%) were the patterns observed. Mean age at initiation was 18.0 years for smoking and 22.4 years for smokeless tobacco, with mean durations of 7.6 and 25.8 years. Misinformation (0.893) and peer pressure (0.882) scored highest, followed by self-medication (0.615) and parental influence (0.516); social rewards (0.274) scored lowest. Mean expenditure was Rs. 12.87 daily and Rs. 2760.64 yearly.

Conclusion: Tobacco use was predominantly daily, smokeless, early-initiated and long-standing, sustained by peer networks, family modelling and beliefs that tobacco revitalises and relieves tension, at a recurring cost to modest household budgets.

INTRODUCTION

Tobacco use remains an important public health problem worldwide, accounting for over eight million deaths every year, the overwhelming majority of them in low- and middle-income countries (1). India too carries an inordinate share of this problem. The second round of the Global Adult Tobacco Survey (GATS-2, 2016–17) estimated that 28.6% of Indian adults, currently used tobacco in some form, comprising 42.4% of men and 14.2% of women (2). What distinguishes the Indian tobacco use epidemic is the predominance of the smokeless form: 21.4% of adults used smokeless tobacco compared with 10.7% who smoked, and khaini, gutkha, betel quid with tobacco and zarda together account for most of this consumption (2,3).

Similarly, the prevalence rates in Jharkhand are also well above the national average. GATS-2 placed the prevalence of current tobacco use in the state at 38.9%, with smokeless tobacco used by 35.4% of adults and smoking by 11.1%; khaini alone was used by 26.6% of adults and gutka by 8.3% (4). The state is mostly rural, with a sizeable tribal population, limited literacy in several districts compounded with easy, inexpensive access to loose, unbranded smokeless products that fall outside the reach of conventional packaging and advertising controls; all of which further complicate tobacco control practices.

Moreover, studying the pattern and predictors of tobacco use help in framing responsive and fruitful policies on tobacco control. In this context, the clinical consequences of tobacco can be predicted by what is consumed, how often, from what age and for how long. Early initiation predicts lifelong dependence and a longer cumulative exposure to carcinogens (5,6), while daily smokeless use sustains prolonged mucosal contact and is associated with oral cancer and coronary heart disease (7,8). Peer networks, tobacco use within the family, perceptions of social reward, risk-taking dispositions and beliefs that tobacco relieves tension or restores energy are important social and behavioural determinants that work together to initiate and maintain tobacco use (9,10).

The economic dimension is equally important and less frequently measured at the community level. Money spent on tobacco comes from a fixed household budget, and Indian studies indicates that households sometimes overspend on tobacco relative to their expenditure on food, education and health, with the poorest households most severely affected (11). Estimates have suggested that the economic cost attributable to tobacco use in India for persons aged 35 years and above was INR 177,341 crore for 2017–18 (12).

Rationale

Most of what is known about tobacco use in Jharkhand derives from large national surveys, which capture little about the behavioural pathways that sustain use, and about product-level combinations or out-of-pocket spending at the level of the individual user. Other studies are concentrated among adolescents, students or urban populations. Consequently, there is a knowledge gap in the program regarding: which products must a cessation service actually address, at what age must prevention begin, how rooted is the habit by the time a user is encountered, which social factors must be dealt with, and how much money is actually being spent on tobacco in the household. This study was undertaken to fill that gap in the rural field practice area of a medical college in Ranchi, so that findings can inform locally tailored activities under the National Tobacco Control Programme.

Objectives

1. To describe the forms, frequency, age at initiation and duration of tobacco use among current tobacco users in the study population.
2. To assess the domain-based predictors (peer pressure, social rewards and risk-taking behaviour, among others) and the monthly and yearly expenditure incurred on tobacco use among current tobacco users.

MATERIALS AND METHODS

Study design and setting: The present study was a community-based cross-sectional study conducted in the rural field practice area of the Rural Health Training Centre (RHTC) of Rajendra Institute of Medical Sciences (RIMS), Ranchi, between April 2018 and March 2019. The RHTC serves three sub-centres — Irba, Chakla and Anandi — located in Ormanjhi block of Ranchi district, a community development block served by one community health centre, two primary health centres and 27 sub-centres. The present study was carried out in the catchment areas of four Anganwadi centres (AWCs) under the Chakla and Anandi sub-centres.

Study population: Participants were subjects aged 15 years or above, irrespective of their tobacco use status, residing in the catchment area of the selected AWCs for more than one year and willing to participate. Those who were severely ill and those unable to understand Hindi or English were excluded.

Sample size: In order to achieve the maximum sample size and due to lack of knowledge of exact prevalence (p) of tobacco use in this population, the ' p ' was assumed to be 50%. With an absolute precision of 10%, a 95% confidence level, and after applying a design effect for cluster sampling, the required sample size was 193. Allowing for a 10% non-response rate, the final sample size was 212. All 94 participants identified as current tobacco users formed the analytical sample for the present analysis.

Sampling method: Cluster random sampling was used. Of the three sub-centres constituting the RHTC, two — Chakla and Anandi — were selected by lottery method. All AWCs under these sub-centres were enumerated (six under Chakla: Upper Chakla, Lower Chakla, Munapatra, Dardag 1, Dardag 2 and Sarnatoli; four under Anandi: Anandi Khas, Dumartoli, Nayatoli and Jhiri). Four clusters were then selected by probability proportional to size (PPS): Dardag 1 and Lower Chakla from Chakla, and Anandi Khas and Jhiri from Anandi. The sample of 212 was distributed equally across the four clusters, giving 53 participants per cluster. Within each cluster, the centre of the cluster was identified and one lane selected at random. Beginning with the first household of that lane, consecutive households were enrolled until 53 participants were obtained. Households were revisited if an eligible participant was absent at the first visit; if a household was locked on two visits, or in the event of non-response or ineligibility, the next nearest household was included.

Study procedure and data collection tool: All interviews were conducted by a single researcher using a semi-structured questionnaire administered in a private room in the participant's home. The questionnaire was developed from a review of the literature, with sections adapted from the Global Adult Tobacco Survey (GATS) (2). Participants were assured of the confidentiality of their responses and of their anonymity.

Measures: Socio-demographic characteristics recorded were age, gender, caste category, ethnicity, religion, educational status, marital status, occupation and income; socio-economic status was classified using the modified B. G. Prasad scale (January 2018 update) (13,14). Participants were classified as current, former or never users of tobacco on the basis of self-report, current tobacco use being defined in accordance with the GATS convention as use of tobacco in any smoked or smokeless form, daily or less than daily, at the time of interview.

Current tobacco users were further asked, separately for smoking and smokeless tobacco, about the mode of use (daily, less than daily, or not at all), the specific products consumed and the frequency of use of each, the age at which use of each form was first started, and the duration of use in years. Participants using both smoked and smokeless products were classified as dual users. Expenditure on tobacco was elicited as the amount spent per day in rupees, from which monthly and yearly expenditure were derived.

Assessment of predictors: Behavioural predictors of tobacco use were assessed among current users through questions grouped into eight domains: peer pressure, social rewards, risk-taking behaviour, parental influence, misinformation, genetic predisposition, advertising and self-medication. Each question was answered as "yes" or "no". For positively worded questions "yes" was scored 1 and "no" 0, and for negatively worded questions the scoring was reversed. Responses were treated as interval variables, and a domain score was computed as the mean of the constituent item scores, giving a possible range of 0 to 1, with higher scores indicating a stronger influence of that domain.

Statistical analysis: Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 20. Categorical variables were expressed as frequencies and percentages, and continuous variables — age at initiation, duration of use and expenditure — as mean $\pm$ standard deviation. Domain scores were expressed as mean $\pm$ standard deviation with 95% confidence intervals for the mean.

Ethical considerations: The ethical approval for the study was obtained from Institutional Ethics Committee of RIMS, Ranchi (Vide memo no. 41, Dated: 20/02/2018). An informed consent statement was read out in Hindi or English at the start of each interview. Written informed consent was obtained from all participants aged 18 years and above. For participants aged 15 to 17 years, written assent was obtained from the participant together with written informed consent from a parent or guardian.

RESULTS

Current tobacco users

Of the 212 participants surveyed, 94 (44.3%) were current tobacco users while none reported former tobacco use, and 118 (55.7%) had never used tobacco. Among the 94 current users, 49 (52.1%) were aged 26–60 years, 24 (25.5%) were older than 61 years and 21 (22.4%) were aged 15–25 years. Men constituted the largest majority of users, 83 (88.3%).

Mode and frequency of tobacco use

Smokeless tobacco was the main pattern of tobacco consumption. Eighty-five users (90.4%) consumed smokeless tobacco daily and none used it less than daily, while 9 (9.6%) did not use any smokeless product. Smoking was distinctly less common and more sporadic: 36 users (38.3%) smoked, of whom only 11 (11.7%) smoked daily and 25 (26.6%) smoked less than daily, while 58 (61.7%) did not smoke at all (Table 1).

Based on single or dual use, participants were delineated into three groups: 58 (61.7%) used smokeless tobacco exclusively, 27 (28.7%) used both smoked and smokeless forms, and only 9 (9.6%) smoked exclusively (Figure 1). Dual use was therefore almost three times as common as exclusive smoking.

Age at initiation and duration of use

Smoking was initiated earlier than smokeless tobacco use. The mean age at starting smoking was 18.00 ± 1.095 years, compared with 22.44 ± 6.860 years for smokeless tobacco. The narrow standard deviation for smoking initiation indicates that smoking almost uniformly began in late adolescence, whereas the wider spread for smokeless tobacco indicates initiation across a broader age band extending well into adulthood. The mean duration of use was more than three times longer for smokeless tobacco (25.8 ± 19.344 years) than for smoking (7.6 ± 8.394 years), consistent with the observation that smokeless use is daily and sustained while smoking is largely intermittent (Table 1).

Expenditure on tobacco

Current users spent a mean of Rs. 12.87 ± 10.93 per day on tobacco. This translated into a mean monthly expenditure of Rs. 332.55 ± 281.55 and a mean yearly expenditure of Rs. 2760.64 ± 2425.90 (Table 1). The large standard deviations relative to the means indicate wide variation between users, with some spending several times the average.

Forms of tobacco used

Khaini was the single most frequently consumed product. Fifty users (53.3%) used khaini alone, daily. Other single-product users included 9 (9.6%) who smoked cigarettes daily, 3 (3.3%) who used gutkha daily and 1 (1.0%) who used gul daily. The remaining users consumed combinations of products. The commonest combinations were daily gutkha with less than daily cigarette smoking, reported by 12 users (12.9%), and daily khaini with less than daily gutkha and cigarette use, reported by 8 users (8.7%). Smaller numbers used khaini together with jarda paan, paan masala or gutkha, or three- and four-product combinations that almost invariably included a smokeless product used daily and cigarettes used less than daily (Table 2). The overall picture shows that smokeless product forms the daily backbone of consumption, and smoking, where it occurs, is accompanied with it intermittently.

Domain-based predictors of tobacco use

The eight predictor domains produced markedly different mean scores (Table 3, Figure 2). Misinformation recorded the highest score (0.893 ± 0.3099 ; 95% CI 0.8301–0.9571), closely followed by peer pressure (0.882 ± 0.2050 ; 95% CI 0.8403–0.9243). Self-medication (0.615 ± 0.3125 ; 95% CI 0.5514–0.6794) and parental influence (0.516 ± 0.1862 ; 95% CI 0.4778–0.5541) came in next. Genetic predisposition (0.393 ± 0.2057), advertising (0.388 ± 0.2093), risk-taking behaviour (0.308 ± 0.3447) and social rewards (0.274 ± 0.2214) all scored below 0.5, with non-overlapping confidence intervals separating this lower group from peer pressure and misinformation.

The item-level responses clarify provide more clarity regarding the domain scores. Within peer pressure, almost all users reported that their friends used tobacco (0.947 ± 0.2256) and that they would use, or had used, tobacco when offered it by friends (0.968 ± 0.1767); 0.883 ± 0.3232 had been offered tobacco by friends. Within parental influence, 0.915 ± 0.2805 reported tobacco use by a household member and 0.894 ± 0.3099 identified that member as a parent, yet only 0.159 ± 0.3681 described their parents as strict about tobacco use. The single misinformation item, the belief that tobacco use revitalizes the

user, was endorsed by 0.894 ± 0.3099 . Within self-medication, the belief that tobacco reduces tension was nearly universal (0.989 ± 0.1031), while beliefs about satiety (0.543 ± 0.5008), reduced depression (0.532 ± 0.5017) and improved overall well-being (0.585 ± 0.4953) were acknowledged by roughly half of users.

By contrast, the social rewards domain remained on the lower side due to little endorsement of the belief that tobacco makes the user look smart (0.095 ± 0.2958) or that it attracts female attention (0.085 ± 0.2805), even though enjoying tobacco in the company of friends scored high (0.829 ± 0.3778). Within risk-taking behaviour, only 0.329 ± 0.4727 felt in control while using tobacco and 0.287 ± 0.4549 would refrain from using tobacco in public.

DISCUSSION

Pattern of tobacco Use

The pattern observed was mostly of daily and smokeless tobacco use: 90.4% of users consumed smokeless tobacco every day and khaini alone accounted for 53.3% of users. This mirrors the state profile from GATS-2, in which smokeless tobacco use (35.4%) far exceeded smoking (11.1%) and khaini was the commonest product in Jharkhand, used by 26.6% of all adults (4). It is also consistent with secondary analyses of GATS-2, which found khaini to be the most frequently consumed smokeless product among smokeless tobacco users and reported that roughly a quarter of such users consumed more than one product (3). The clinical significance of this pattern is considerable: daily smokeless use maintains prolonged contact between tobacco-specific nitrosamines and the oral mucosa and carries an established risk of oral cancer and coronary heart disease (7,8), yet it attracts far less programmatic attention than smoking. Interestingly, smoking in this population was found to be in lesser magnitude; only 9.6% smoked exclusively, and most cigarette use occurred less than daily and usually as dual use. Therefore, a cessation service designed around cigarettes would miss the great majority of tobacco users in this community.

Early initiation and long habituation

Smoking began at a mean age of 18.0 years and smokeless use at 22.4 years. The mean age at initiation of tobacco use nationally rose from 17.8 years in GATS-1 to 19.3 years in GATS-2, and among Indian youth the mean age of initiating daily smoking has been reported at about 17 years and of smokeless tobacco at about 20 years (5). Our figures are closer to these national estimates, with smoking again beginning earlier than smokeless use. The tightly clustered age at smoking initiation (SD 1.095 years) suggests that late adolescence is a sharply defined window of vulnerability in this community, which argues for school- and youth-focused prevention before the age of 18. In an urban slum of Bhavnagar, smokeless tobacco users began at a mean of 25 years and had been chewing for a mean of 15 years (15); our participants began earlier (22.4 years) and had continued considerably longer (25.8 years). A mean duration of more than two decades of daily smokeless use implies that most users encountered in this field practice area are not experimenting but are deeply established, with correspondingly high cumulative exposure and, plausibly, high dependence.

Social and cognitive drivers

The present study points that instead of advertising or self-image, the social environment and attitudes about the benefits of tobacco use were the primary drivers of tobacco use in this demographic. Peer pressure scored 0.882, driven by near-universal reports that friends used tobacco and that tobacco offered by friends would be accepted. This confirms with the finding from rural Uttar Pradesh that peer influence significantly increased the odds of tobacco use among men (9), and with the observation that peer pressure and imitation are the commonest reported reasons for initiation among rural adolescents in Rajasthan (10). Parental influence scored 0.516, with about nine in ten users reporting a tobacco-using parent. Misinformation carried the highest score of all (0.893): the belief that tobacco revitalizes the user was endorsed by nearly everyone. Coupled with self-medication (0.615), in which the belief that tobacco relieves tension was almost universal; the findings from present study population suggests that use of tobacco was not because it was trendy but because people believed it to work. Consistently, the domains linked to image and social reward scored lowest, social rewards at 0.274 and advertising at 0.388, which may be because this was a rural setting where loose, unbranded khaini was bought without packaging or promotion. The practical implication of these findings is that health messaging built solely on prohibition or on countering advertising is likely to be ineffective; messaging must directly challenge the perceived functional benefits of tobacco and must work at the level of the peer group and the household rather than the individual alone.

The cost of the habit

Users spent a mean of Rs. 12.87 daily, Rs. 332.55 monthly and Rs. 2760.64 yearly on tobacco. In absolute terms these sums appear modest, and they are considerably lower than the national GATS-2 estimates of average monthly expenditure of Rs. 1192.5 by daily cigarette smokers and Rs. 284.1 by daily bidi smokers (2), and lower than the mean of about Rs. 536 per month spent on smokeless tobacco by users in an urban slum of Bhavnagar (15). This is consistent in current rural population whose consumption was dominated by khaini, among the cheapest tobacco products available. The apparent cheapness of the habit is, however, precisely the danger. Low unit cost removes the price barrier that would otherwise deter initiation and encourage quitting, and the recurring nature of the expense means that an outlay of roughly Rs. 2761 per year is drawn each year from a household budget in a rural community. Indian evidence shows that tobacco expenditure tends to crowd out spending on food, education and health, and that the poorest households sacrifice essentials most (11); at the national level the economic cost attributable to tobacco use has been estimated at INR 177,341 crore for a single year (12). Presenting users with the annual, rather than the daily, figure, and translating it into what it could buy for the household, may be a more persuasive cessation message than the daily amount, which is easily dismissed as small and inconsequential. It also strengthens the case for taxing and regulating loose smokeless products, which escape the price-based deterrence applied to cigarettes.

STRENGTHS AND LIMITATIONS

The principal strength of this study is its granularity. Rather than classifying participants simply as users or non-users, it recorded the specific products consumed and the frequency of use of each, permitting the identification of exclusive, dual and multi-product patterns that are invisible in aggregated survey categories. It combined this with age at initiation, duration of use, structured behavioural domains and out-of-pocket expenditure in the same set of users, allowing the behavioural and economic dimensions of tobacco use to be read together. Being conducted in a defined rural field practice area, the findings translate directly into action for the health system serving that population.

Several limitations must be acknowledged. The cross-sectional design permits no inference about causation; the domains identified as predictors are associations reported by users, not causes established over time. All information, including age at initiation, duration of use and expenditure, was self-reported and is therefore subject to recall and social desirability bias. The predictor domains were derived from binary yes/no items scored as interval variables, and the number of items per domain was unequal, ranging from a single item in some domains to five in another; domain scores are therefore best interpreted as descriptive indices rather than as psychometrically validated scales. The sample of 94 current users was drawn from a single rural field practice area and included only 11 women, which precludes meaningful sex-disaggregated analysis and limits generalizability to other settings in Jharkhand and beyond.

CONCLUSION

Among rural adults in this field practice area of Jharkhand, tobacco use is predominantly smokeless, daily, khaini-centred and long-standing, initiated in late adolescence or early adulthood and sustained for a mean of more than two decades. Its principal drivers are the belief that tobacco revitalizes and relieves tension, reinforced by peer networks and by tobacco use within the family. The habit costs a mean of nearly Rs. 2761 per user per year, a recurring drain on modest rural household budgets. Tobacco control efforts in such settings must therefore be re-oriented away from a cigarette-centred model towards one that targets smokeless products, begins prevention before the age of 18, engages peer groups and families rather than individuals, directly challenges the perceived functional benefits of tobacco, and makes the cumulative annual cost of the habit visible to those who bear it.

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Table 1: Mode and frequency of tobacco use, age at initiation, duration of use and expenditure on tobacco among current tobacco users (n=94)

Characteristic	Frequency (n=94)	Percentage (%)
Smoking tobacco		
Daily*	11	11.7
Less than daily	25	26.6
Not at all	58	61.7
Smokeless tobacco		
Daily	85	90.4
Less than daily	0	0
Not at all	9	9.6
Age at initiation and duration of use		Mean $\pm$ SD (years)
Age at starting smoking	18.00 $\pm$ 1.095	
Age at starting smokeless tobacco	22.44 $\pm$ 6.860	
Duration of smoking	7.6 $\pm$ 8.394	
Duration of smokeless tobacco use	25.8 $\pm$ 19.344	
Expenditure on tobacco		Mean $\pm$ SD (Rupees)
Daily	12.87 $\pm$ 10.93	
Monthly	332.55 $\pm$ 281.55	
Yearly	2760.64 $\pm$ 2425.90	

*Two daily smokers also used smokeless tobacco daily. SD: standard deviation.

Table 2: Distribution of current tobacco users according to the form of tobacco used and the frequency of use of each product (n=94)

Form of tobacco	Frequency of tobacco use	Users (n=94)	Percentage (%)
Cigarette	Daily	9	9.6
Cigarette and paan masala/tulsi	Daily	2	2.1
Khaini	Daily	50	53.3
Khaini and jarda paan	Daily	2	2.1
Khaini and paan masala/tulsi	Daily	1	1.0
Khaini and gutkha	Daily	1	1.0
Gutkha	Daily	3	3.3
Gul	Daily	1	1.0
Khaini	Daily	1	1.0
Cigarette	Less than daily		
Khaini	Daily	1	1.0
Paan masala/tulsi	Daily		
Gutkha	Less than daily		
Cigarette	Less than daily		
Khaini	Daily	8	8.7

Form of tobacco	Frequency of tobacco use	Users (n=94)	Percentage (%)
Gutkha	Less than daily		
Cigarette	Less than daily		
Gutkha	Daily	12	12.9
Cigarette	Less than daily		
Gutkha	Daily	1	1.0
Paan masala/tulsi	Daily		
Cigarette	Less than daily		
Gutkha	Daily	1	1.0
Paan masala/tulsi	Daily		
Jardaa paan	Daily		
Cigarette	Less than daily		
Jardaa paan	Daily	1	1.0
Cigarette	Less than daily		
Total		94	100

Percentages are as reported in the source data and may not correspond exactly to the calculated proportion because of rounding.

Table 3: Domain-based predictor scores and responses to individual items among current tobacco users (n=94)

Predictor domain / item	Mean $\pm$ SD	95% CI for mean
Peer pressure	0.882 $\pm$ 0.2050	0.8403 – 0.9243
<i>Do your friends use tobacco?</i>	0.947 $\pm$ 0.2256	–
<i>Have you ever been offered any form of tobacco by your friends?</i>	0.883 $\pm$ 0.3232	–
<i>If offered any form of tobacco by your friends, will you use it?</i>	0.968 $\pm$ 0.1767	–
Social rewards	0.274 $\pm$ 0.2214	0.2291 – 0.3198
<i>Do you enjoy using tobacco while being with a group of friends?</i>	0.829 $\pm$ 0.3778	–
<i>Does using tobacco make you look smart?</i>	0.095 $\pm$ 0.2958	–
<i>Does using tobacco make you believe in yourself?</i>	0.287 $\pm$ 0.4549	–
<i>Do you think tobacco users are looked down upon in society?</i>	0.0745 $\pm$ 0.2639	–
<i>Do you think females are attracted towards people who use tobacco?</i>	0.085 $\pm$ 0.2805	–
Risk-taking behaviour	0.308 $\pm$ 0.3447	0.2379 – 0.3791
<i>Do you feel in control when you use tobacco?</i>	0.329 $\pm$ 0.4727	–
<i>Will you refrain from using tobacco in public?</i>	0.287 $\pm$ 0.4549	–
Parental influence	0.516 $\pm$ 0.1862	0.4778 – 0.5541
<i>Does anybody in your household use tobacco?</i>	0.915 $\pm$ 0.2805	–
<i>Are they your parents?</i>	0.894 $\pm$ 0.3099	–
<i>Are your parents strict about tobacco use?</i>	0.159 $\pm$ 0.3681	–
<i>Are your parents relaxed about tobacco use?</i>	0.096 $\pm$ 0.2958	–
Misinformation	0.893 $\pm$ 0.3099	0.8301 – 0.9571
<i>Do you think tobacco use revitalizes you?</i>	0.894 $\pm$ 0.3099	–
Genetic predisposition	0.393 $\pm$ 0.2057	0.3515 – 0.4358

Predictor domain / item	Mean $\pm$ SD	95% CI for mean
<i>Do you think most male members in your family use tobacco products?</i>	0.787 $\pm$ 0.4115	—
Advertising	0.388 $\pm$ 0.2093	0.3454 – 0.4312
Self-medication	0.615 $\pm$ 0.3125	0.5514 – 0.6794
<i>Do you feel less tense after using tobacco?</i>	0.989 $\pm$ 0.1031	—
<i>Do you feel satiety after using tobacco?</i>	0.543 $\pm$ 0.5008	—
<i>Do you feel less depressed after using tobacco?</i>	0.532 $\pm$ 0.5017	—
<i>Do you feel increased overall well-being after using tobacco?</i>	0.585 $\pm$ 0.4953	—

Domain scores were computed as the mean of the constituent item scores (possible range 0–1). For positively worded questions, "yes" was scored 1 and "no" 0; for negatively worded questions, the scoring was reversed. Responses were treated as interval variables. Individual item responses shown are those reported in the source data; items are not listed for every domain. SD: standard deviation; CI: confidence interval.

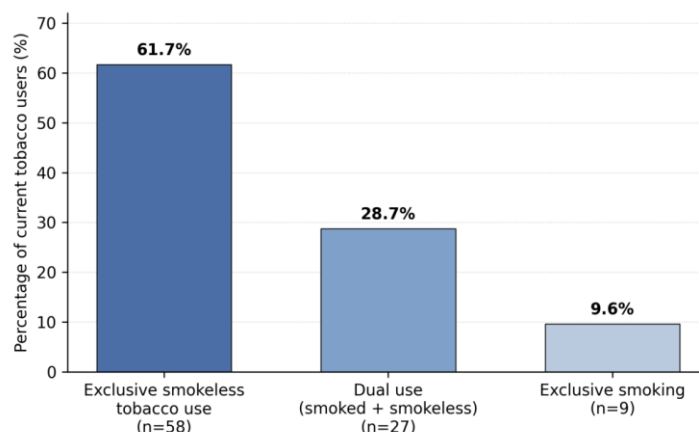


Figure 1: Distribution of current tobacco users according to exclusive smokeless use, dual use and exclusive smoking (n=94)

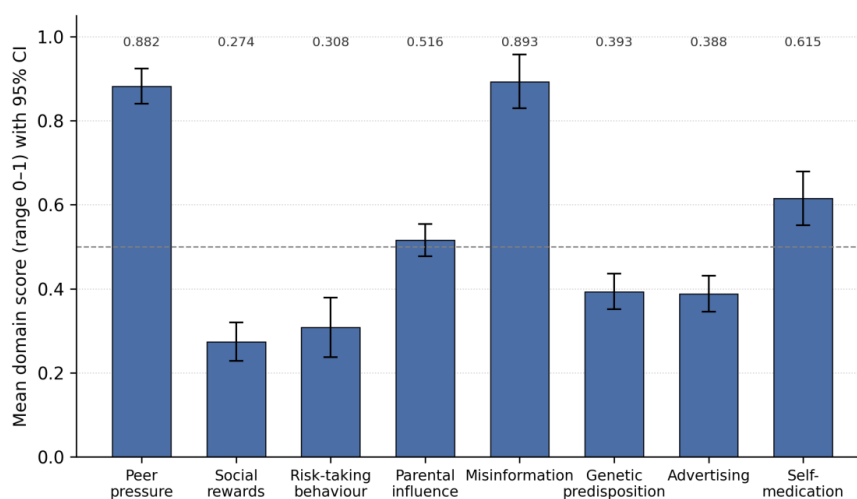


Figure 2: Domain-based predictor scores with 95% confidence intervals among current tobacco users (n=94)

Possible score range 0–1; higher scores indicate a stronger influence of the domain. The dashed line marks the mid-point of the scale.