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# Evaluation of Knowledge, Attitude, and Prevalence of Tobacco Use Among Adolescents Aged 10–18 Years in Rajnandgaon, Chhattisgarh: A Cross-Sectional Epidemiological Survey

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**Abstract**

**Background:** Tobacco consumption amongst adolescents has reached pandemic proportions globally. Early initiation significantly increases long-term dependency and healthcare burdens. This study aimed to comprehensively evaluate the specific knowledge levels, behavioral attitudes, environmental exposure dynamics, and overall prevalence of tobacco and smokeless gutkha use among adolescents aged 10–18 years in Rajnandgaon city, Chhattisgarh, India.

**Materials and Methods:** A convenient simple random cross-sectional epidemiological screening was carried out among 300 students randomly selected from government and private schools across Rajnandgaon. Data collection was accomplished utilizing a validated, pre-piloted, close- and open-ended structural questionnaire derived from the Global Youth Tobacco Survey (GYTS)

framework. Data processing and statistical descriptive breakdowns were accomplished via SPSS Version 21.0.

**Results:** High awareness was documented, with 96.0% having heard of tobacco and 94.0% acknowledging its explicit toxic risks to human health. However, an alarming personal ever-use prevalence rate of 90.0% (n=270) was established, among whom 97.7% report a consumption pattern of twice daily. Peers and media emerged as primary environmental drivers, with 88.8% of users reporting active use among close friends and 96.33% confirming profound media influence. Critically, 57.3% expressed a controversial peer-driven attitude that child usage is acceptable, while 74.67% of the cohort demonstrated a vital willingness to quit if structured clinical assistance or cessation support fields are provided.

**Conclusion:** A severe disconnect exists between theoretical awareness and actual behavior. High prevalence and pervasive peer modeling underscore the critical necessity to move beyond mere education towards aggressive, structured, community-based youth cessation interventions and strict retail access control frameworks.

**Keywords:** Adolescents, Attitude, Gutkha, Knowledge, Prevalence, Smokeless Tobacco, Youth Cessation.

**Introduction**

Tobacco use is established as one of the single most devastating preventable causes of chronic morbidity and mortality worldwide. The global epidemic of tobacco consumption has uniquely positioned children and adolescents as its primary victims, given that habit initiation almost universally occurs during early developmental years. The vulnerability of this specific age cohort represents an escalating pandemic, with current longitudinal epidemiological trends indicating that tobacco-related pathologies will trigger over 8 million deaths annually across the globe by the year 2030.

In the context of developing nations such as India, the oral health burden associated with both smoked and smokeless tobacco varieties is exceptionally profound. Commercial entities within the tobacco sector aggressively focus marketing and advertising efforts on developing regions, using cinematic portrayals, mass digital media platforms, and strategic product placement. Adolescents are readily influenced by these factors alongside potent immediate peer modeling. Furthermore, multiple systemic vulnerabilities—including lower family socioeconomic placement, localized availability, low product costs, lack of immediate parental guidance, and compromised individual self-esteem—exacerbate the likelihood of early initiation. Historically, the Global Youth Tobacco Survey (GYTS) datasets from preceding decades underscored a widespread adolescent ever-use rate of 25.1% across the country.

While modern public health interventions and focused statutory actions within the State of Chhattisgarh have led to a noticeable decline in adult smokeless tobacco metrics from GATS-1 (47.2%) down to GATS-2 (36%), the reality across rural and semi-urban boundaries reveals a separate concern. Localized, unregulated retail structures continue to maintain high demand for low-cost smokeless varieties like gutkha, directly appealing to school-aged youth in small towns and adjacent peripheral settlements. Earlier localized studies within the region, such as those by Ram and co-investigators, recorded alarming adolescent consumption baselines around 20.4%. Because the clinical risks of severe chronic dependency are directly tied to an early age of habit initiation, targeted evaluation of local cohorts is essential. Therefore, the present cross-sectional investigation was undertaken to establish clear epidemiological data on the

exact knowledge baselines, behavioral attitudes, environmental exposure factors, and actual prevalence metrics regarding tobacco products among school-going adolescents aged 10–18 years within the city of Rajnandgaon, Chhattisgarh.

## Materials and Methods

### Study Design and Setting

This descriptive, epidemiological cross-sectional questionnaire screening was formally executed under the institutional aegis of the Department of Pedodontics and Preventive Dentistry at the Chhattisgarh Dental College & Research Institute, located in Sundra, Rajnandgaon, Chhattisgarh, India. Prior to initiation, the standardized study protocol underwent rigorous administrative review and received formal clearance from the Institutional Review Board, Scientific Research Committee, and the Institutional Ethical Committee of the facility.

### Sample Size Derivation

The baseline calculation of the minimum statistical sample size required for this cross-sectional exploration was structured using the standardized single population proportion estimation mathematical formula: $n = [Z^2 \times P \times (1 - P)] / d^2$ Where the parameter Z represents the normal standard score associated with a 95% statistical confidence level, fixed firmly at 1.96. The population prevalence parameter (P) was estimated at 25.0% based on recent regional pediatric oral epidemiological data. The absolute allowable margin of precision error (d) was restricted strictly to 5% (0.05). This formulation yielded a baseline minimum calculation of 289 subjects. To safeguard the scientific validity of the survey from potential missing items or incomplete data entries, the cohort was scaled up and fully rounded to an even sample size of exactly 300 adolescent participants.

### Inclusion and Exclusion Framework

Rigid screening boundaries were set. The inclusion criteria required: (i) Adolescents within the exact chronological age bracket of 10 to 18 years; (ii) regular students registered in selected government or private schools within Rajnandgaon city; and (iii) individuals demonstrating full capacity to independently comprehend and complete the structured survey sheets. Conversely, the exclusion framework strictly omitted: (i) Any student failing to secure informed parental/guardian consent; (ii) any survey returned blank or with extensive missing entries; and (iii) children diagnosed with verified cognitive or learning disabilities, or severe physical/mental challenges that prevent independent response compilation.

### Data Collection Instrument and Methodology

The epidemiological screening instrument consisted of a multi-section structured questionnaire containing clear close- and open-ended entries, adapted carefully from the core Global Youth Tobacco Survey (GYTS) framework. To ensure high translation accuracy and literal reliability, the instrument was prepared in identical bilingual English and Hindi formats. A preliminary pilot trial involving 20% of the active cohort confirmed strong internal reliability and consistency, yielding favorable metric coefficients: Kappa (k) = 0.86, weighted Kappa (kw) = 0.90, and Cronbach's Alpha ($\alpha$) = 0.78.

The actual questionnaire was divided into distinct operational components: Section 1 collected comprehensive baseline sociodemographic variables including age, gender distribution, school class, parental occupations, home address, and self-reported family socioeconomic status. Section 2 examined direct awareness and information exposure parameters. Section 3 evaluated specific personal use profiles, frequency metrics, and cessation histories. Section 4 detailed family

use and residential background exposure. Section 5 evaluated self-reported health complications and formal health education access, and Section 6 recorded specific behavioral attitudes regarding youth use.

Administrative clearances and formal authorization were secured from the managing heads of each participating educational institution. Before distributing the survey, informed written consent forms were obtained from parents or legal guardians, and personal assent was secured from each participating adolescent. Absolute confidentiality and anonymity were maintained throughout; students completed the sheets in a private classroom layout with school staff absent, and no identifying personal information was collected.

**Statistical Data Processing**

The collected survey data were coded and analyzed using standard statistical tools via the IBM SPSS Product and Service Solutions software suite (Version 21.0, Chicago, IL). Qualitative or categorical variables were detailed using descriptive parameters, specifically raw frequencies (n) and precise percentage proportions (%). Quantitative data elements were expressed through mean values accompanied by standard deviation scores (Mean ± SD). The confidence interval ceiling was fixed at 95%, with the a priori level of statistical significance set at a p-value threshold of less than 5% ($p < 0.05$).

**Results**

A total cohort of 300 adolescent school children completed the evaluation without loss of data. The definitive statistical results are categorized below according to the specific sections of the validated survey framework.

**Section A: Analytical Assessment of Awareness and Exposure Channels**

The baseline screening recorded a remarkably high level of overall theoretical knowledge regarding the existence of tobacco. As detailed in Table 1, a significant 96.0% (n=288) of the children had heard of tobacco or gutkha products, leaving a minor 4.0% (n=12) unfamiliar with them.

Table 1:

| Response Option | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 288 | 96.0% |
| No | 12 | 4.0% |
| Total | 300 | 100.0% |

When investigating the primary initial channel of information regarding these substances, the domestic home environment emerged as the dominant source. Table 2 shows that 87.0% (n=261) first learned about tobacco products at home, followed by 10.33% (n=31) at school, and 2.67% (n=8) through other mixed media channels.

Table 2:

| Source of First Information | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Home Environment | 261 | 87.00% |

| | | |
|---|---|---|
| School Environment | 31 | 10.33% |
| Others/ Alternative Mediums | 8 | 2.67% |
| Total | 300 | 100.00% |

Theoretical knowledge regarding the severe clinical hazards of use was also widespread. Table 3 confirms that 94.0% (n=282) of the adolescents recognized that tobacco consumption is harmful to health, while 6.0% (n=18) did not recognize these risks.

Table 3:

| Is Tobacco Harmful to Health? | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 282 | 94.0% |
| No | 18 | 6.0% |
| Total | 300 | 100.0% |

External environmental influences from media platforms and commercial advertising showed a strong presence among this demographic. Table 4 indicates that 96.33% (n=289) of respondents reported a definitive media influence on their knowledge or behavior, with only 3.0% (n=9) noting no effect and 0.67% (n=2) remaining uncertain.

Table 4:

| Media Influence Recognized | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 289 | 96.33% |
| No | 9 | 3.00% |
| Maybe | 2 | 0.67% |
| Total | 300 | 100.00% |

This external influence was further supported by the reported impact of social models, including close friends, family figures, and public celebrities. Table 5 demonstrates that an overwhelming 98.33% (n=295) of the cohort recognized a clear social influence regarding views on tobacco, while only 1.67% (n=5) reported no such effect.

Table 5:

| Influence of Friends / Celebrities / Family | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 295 | 98.33% |
| No | 5 | 1.67% |
| Total | 300 | 100.0% |

**Section B: Operational Profile of Personal Substance Usage**

Despite high general awareness of health risks, the survey revealed an exceptionally high personal ever-use prevalence rate. Table 6 indicates that 90.0% (n=270) of the adolescent sample had personally tried or used tobacco or gutkha products, leaving only 10.0% (n=30) who had completely abstained.

Table 6:

| Ever Tried Tobacco / Gutkha | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes (Active / Ever Users) | 270 | 90.0% |
| No (Never Users) | 30 | 10.0% |
| Total | 300 | 100.0% |

An analysis of consumption frequency among the 270 users revealed highly established behavioral habits. As shown in Table 7, a substantial 97.7% (n=264) consumed the product twice daily, while a small group of 2.3% (n=6) reported a frequency of once a day.

Table 7:

| Frequency of Usage (Subset of Users) | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Once a day | 6 | 2.3% |
| Twice a day | 264 | 97.7% |
| More than twice a day | 0 | 0.0% |
| Total Active Subset | 270 | 100.0% |

Peer relationships appeared to be a strong factor linked to personal habit development. Table 8 demonstrates that 88.8% (n=240) of tobacco-using adolescents reported that their close friends also actively consume tobacco or gutkha, highlighting a clear pattern of shared peer habits.

Table 8:

| Do Your Friends Use Tobacco? | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 240 | 88.8% |
| No | 30 | 11.2% |
| Total Active Subset | 270 | 100.0% |

Importantly, a considerable percentage of users had attempted to change this behavior. Table 9 reveals that 75.0% (n=225) of the total cohort had actively attempted to quit using the substance, while 15.0% (n=45) had never made a cessation attempt.

Table 9:

| Attempted to Quit Consumption | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes (Active Cessation Attempt) | 225 | 75.0% |
| No | 45 | 15.0% |
| Not applicable (Never Used) | 30 | 10.0% |
| Total Cohort | 300 | 100.0% |

**Section C: Evaluation of Family and Home Environmental Exposure**

While social circles outside the school showed high habit prevalence, direct product use within the home was reported as much lower. Table 10 shows that 10.67% (n=32) of respondents reported active tobacco or gutkha use by family members, while 89.33% (n=268) reported no family use.

Table 10:

| Family Members Using Tobacco | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 32 | 10.67% |
| No | 268 | 89.33% |
| Total Cohort | 300 | 100.00% |

Consistent with these findings, regular environmental exposure to tobacco smoke or product use inside the home was limited. Table 11 indicates that 7.0% (n=21) of adolescents experienced direct exposure at home, while 93.0% (n=279) lived in tobacco-free households.

Table 11:

| Exposed to Tobacco Use at Home | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 21 | 7.0% |
| No | 279 | 93.0% |
| Total Cohort | 300 | 100.0% |

Direct personal encouragement from immediate family or social figures was also less common. Table 12 records that 8.6% (n=26) of the sample reported being directly encouraged by someone to try tobacco, whereas 91.4% (n=274) reported no direct initiation pressure.

Table 12:

| Direct Encouragement by Someone to Try | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 26 | 8.6% |
| No | 274 | 91.4% |
| Total Cohort | 300 | 100.0% |

**Section D: Assessment of Health Complications and Education Access**

Despite the high prevalence and frequency of use, acute clinical symptoms or health issues were not widely reported by this young cohort. Table 13 indicates that 8.6% (n=26) of respondents had personally experienced noticeable health problems after usage, while 91.4% (n=274) reported no clear acute symptoms.

Table 13:

| Health Problems Experienced After Use | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 26 | 8.6% |
| No | 274 | 91.4% |
| Total Cohort | 300 | 100.0% |

Regarding institutional educational outreach, a large majority of the adolescents had received formal instruction on these risks. Table 14 shows that 88.33% (n=265) had been educated about the dangers of tobacco by a school teacher or public health worker, while 11.67% (n=35) reported no such instruction.

Table 14:

| Educated by Teacher / Health Worker | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 265 | 88.33% |
| No | 35 | 11.67% |
| Total Cohort | 300 | 100.00% |

A key finding from the survey was a widespread desire for assistance in quitting. Table 15 demonstrates that 74.67% (n=224) of the adolescents expressed a willingness to stop using tobacco if provided with structured clinical help or counseling, while 25.33% (n=76) reported no interest.

Table 15:

| Willingness to Quit if Help Provided | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 224 | 74.67% |
| No | 76 | 25.33% |
| Total Cohort | 300 | 100.00% |

**Section E: Evaluation of Behavioral Attitudes**

The survey recorded an interesting contrast in attitudes within the sample. While general health awareness was high, personal social acceptance was common. Table 16 reveals that 57.3% (n=172) of respondents expressed the view that tobacco use is acceptable for children, while 42.7% (n=128) considered it unacceptable.

Table 16:

| Is it OK for Children to Use Tobacco? | Frequency (n) | Percentage Proportions (%) |
|---|---|---|
| Yes | 172 | 57.3% |
| No | 128 | 42.7% |
| Total Cohort | 300 | 100.0% |

**Discussion**

This epidemiological screening reveals a critical gap between theoretical knowledge and actual behavior among adolescents in Rajnandgaon. The data demonstrate a serious public health challenge: while general awareness of the toxic risks of tobacco is nearly universal (94.0%), the personal ever-use prevalence rate among these school children stands at an alarming 90.0%. This clear contradiction indicates that standard health education programs, though successful at delivering basic facts, are not effectively preventing the adoption of dangerous habits in this young population.

A major factor driving this high prevalence is the powerful influence of peer groups. A significant 88.8%

of users reported that their close friends consume tobacco or gutkha regularly. During adolescence, individuals are highly sensitive to social normalization and peer acceptance, making them prone to adopting behaviors common in their social circles. This social pressure is reinforced by pervasive media influence (96.33%) and social modeling from public figures or celebrities (98.33%). These external sources often make tobacco consumption appear attractive or normal, directly contributing to the complex attitude where 57.3% of respondents view child usage as acceptable, despite knowing the health risks.

Interestingly, the data show a strong contrast between social influences outside the home and the household environment itself. Only 10.67% of adolescents reported tobacco use among family members, and only 7.0% noted regular exposure to use inside their homes. This indicates that the widespread initiation of tobacco and gutkha habits is primarily occurring outside domestic spaces, driven by school-aged social circles, peer groups, and easy access to low-cost products at local retail outlets.

The high frequency of consumption—with 97.7% of users consuming products twice daily—presents a serious clinical risk for rapid development of chronic nicotine addiction and early oral tissue modifications. However, the survey also highlights a major opportunity for public health intervention. A substantial 75.0% of users have made active attempts to quit, and 74.67% expressed a clear willingness to stop using if provided with structured support. This high level of interest in cessation indicates that adolescents are aware of their dependency and would welcome professional help, including clinical counseling, school-based support groups, and structured tobacco cessation programs.

These findings indicate that existing anti-tobacco education campaigns, which reach 88.33% of the sample, are effective at raising awareness but insufficient for changing behavior. Public health strategies must move beyond simply providing information. Effective interventions require the development of accessible youth cessation networks, regular counseling services in schools, strict enforcement of legal bans on selling tobacco products near educational institutions, and community-based campaigns designed to challenge the social normalization of tobacco use among young people.

**Conclusion**

This investigation documents a high prevalence of tobacco and gutkha ever-use (90.0%) among school-going adolescents in Rajnandgaon, Chhattisgarh, highlighting a clear gap between basic health awareness and actual behavior. Pervasive peer group usage and widespread media exposure serve as the primary environmental drivers of habit initiation and social acceptance, overshadowing traditional health education efforts and lower household exposure rates.

The widespread frequency of use emphasizes the urgent need for action, but the strong willingness to quit (74.67%) among these adolescents provides a clear opening for targeted interventions. Public health strategies must expand beyond classroom education to build dedicated, accessible youth tobacco cessation networks, offer regular professional counseling within schools, and enforce strict regulatory limits on the sale and marketing of cheap tobacco products to minors. Comprehensive, community-wide programs are essential to change social norms and safeguard the long-term oral and general health of this vulnerable demographic.

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