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Tobacco use in Kerala: Findings from three recent studies

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ABSTRACT

Background. We reviewed the literature on tobacco use in Kerala and present data from three recently conducted unpublished studies.

Methods. Three cross-sectional studies were conducted; a community-based study of 1298 individuals aged 15 years and above (mean age 37.4 years, men 630), a school-based study of 1323 boys (mean age 14.7 years), and a college-based study of 1254 male students (mean age 18.2 years). Information on tobacco use and sociodemographic variables was collected using pre-tested, structured interview schedules and questionnaires.

Results. In the community study, 72% of men and 6% of women had ever used tobacco. Compared to men with >12 years of schooling, those with <5 years of schooling were 7 times more likely to smoke (OR 7, CI 3.2–15.6). The age at initiation of smoking was 19 years among those <25 years of age compared to 25.5 years among ever smokers >44 years. In the school study, the age at initiation among boys aged ≤13 years was 10.7 years compared with 13.2 years among ≥16-year-old boys. Boys whose fathers and friends used tobacco were 2 times and 2.9 times more likely to use tobacco (OR 2.0, CI 1.3–3.1 and OR 2.9, CI 1.6–5.1), respectively, compared with their counterparts. In the college study, 29% of the commerce students used tobacco compared with 5.3% of polytechnic students ($p < 0.001$).

Conclusion. Survey data suggest that the age at initiation of tobacco use appears to be falling. A series of cross-sectional studies with larger sample sizes of the youth is required to confirm this impression. Tobacco use habits of fathers and peers are significant influences on youth smoking. There is a need to focus on particular types of colleges as these appear to have high-risk tobacco use environments.

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INTRODUCTION

Tobacco is one of the major preventable causes of morbidity and mortality in the world. It currently accounts for over 4 million deaths annually, which is projected to rise to 10 million by 2030, with 70% of these deaths occurring in developing countries. This will make tobacco the largest cause of death in the world.^{1–3}

In India, tobacco-related diseases are on the rise, currently accounting for 1 million deaths annually.⁴ By the year 2020, the number of tobacco-related deaths is projected to be 1.5 million annually, which will be approximately 13% of all deaths in India.^{5–9} According to the Indian Council of Medical Research (ICMR), in India each year nearly 160 000 people develop cancer, 4.5 million develop heart disease and 3.9 million develop chronic obstructive lung disease as a result of tobacco consumption.^{10–12} One-half of all cancers among men and one-fifth among women are attributable to tobacco use. A distinguishing feature of tobacco-related morbidity in India is that the incidence of oral cancer exceeds that of lung cancer and is one of the highest in the world.¹³ One-third of all cancers in India are reported to be oral cancers and 90% of oral cancer patients are tobacco users.^{8,13} Heart disease is also strongly associated with tobacco use.^{5,8,14} It is estimated that 60% of patients below 40 years of age with heart disease use tobacco.^{14,15}

Health problems related to tobacco use are a major drain on the resources of developing countries.⁵ In a study by the ICMR, which provided a conservative estimate of the cost of treatment of 3 major tobacco-related diseases (cancer, heart disease and chronic obstructive pulmonary disease), it was found that the government spent an estimated Rs 277.6 billion (US\$ 6.5 billion) in 1999. The nationwide sale value of all tobacco products during this period was Rs 244 billion. Since only a fraction of this goes to the government in the form of taxes, the gap between revenue from tobacco sales and expenditure for treating tobacco-related diseases is extremely high. Thus, it may be forcefully argued that tobacco is of no economic benefit to the nation while being a major health hazard.^{8,12,13}

The existing literature on tobacco use in India suggests that there are major differences in regional trends of tobacco use, both with respect to types of tobacco products used and prevalence rates among specific populations characterized by age, sex, social class and ethnic group. However, the reported data do not reflect the changing trends of tobacco use, especially among the younger age groups. In this paper we focus on tobacco use in the state of Kerala, India, reviewing the published literature. We also present data from 3 recently conducted unpublished studies on tobacco use among a rural population, a sample of schoolchildren, and of college students.

TOBACCO USE IN KERALA

What do we know about tobacco use in Kerala?

The earliest data on tobacco use in Kerala comes from a multicentre study in 1969, which included the Ernakulam district of Kerala. The authors reported a 22% prevalence of current smoking among men and 0.4% among women ≥ 15 years of age. Tobacco chewing was reported among 6.5% and 19.7% of men and women, respectively.¹⁶ During a 10-year follow up study, a 5% increase in tobacco use was reported.¹⁷ Another study in Thiruvananthapuram district in 1995 reported a prevalence of 50.1% for current smoking among men and 1.7% among women ≥ 35 years of age. Tobacco chewing was reported in 23.8% and 22.2% of men and women, respectively, in the study.¹⁸ A 1987 study covering the entire rural area of the state found that 53% of men > 15 years of age were current smokers, 13% were chewers of some form of tobacco (or tobacco and betel quid), and 2% used snuff.¹⁹ The National Sample Survey (NSS) done in Kerala in 1988 corroborated the finding of high tobacco use. The prevalence of any form of tobacco use among all those > 15 years of age in rural areas of the state was reported to be 44.6% among men and 13.4% among women.²⁰ The more recent fiftieth NSS conducted in 1993–94 reported that the prevalence of consumption of any form of tobacco in the same age groups was 34.6% among men and 6.7% among women. The prevalence of smoking was 31.6% among men and 0.6% among women.²⁰

A few other studies of tobacco use in Kerala are worth noting because they focused more closely on particular populations. A study by Kutty *et al.* (1990) of a rural population of 1130 people reported a prevalence of smoking of around 50% among men aged 35–64 years.²¹ Data from the National Family Health Survey (NFHS-2), a cross-sectional, population-based household survey done in 1998–99 among a sample of 2834 Kerala households, reported a 10% prevalence of chewing *pan masala* or tobacco among men > 15 years of age and 11% among women. The current smoking prevalence for men was reported to be 28% and for women $< 1\%$.²²

Collectively, findings from the 3 recent studies giving us a clearer picture of tobacco use in Kerala and help in identifying important directions for future research on tobacco use among the youth.

METHODS

Community study

Between January and March 1999, six trained investigators interviewed members of 360 households in a rural *panchayat* of Thiruvananthapuram district. These households were selected through a stratified random sampling technique designed to generate a generalizable sample of households in a typical primary health centre (PHC) catchment area located 20 km from Thiruvananthapuram city. Thirty households were selected randomly from all the 12 administrative wards of this *panchayat* and everyone ≥ 15 years of age in these selected 360 households was eligible to participate. A total of 1308 individuals were eligible and information on tobacco use was collected from 1298 individuals using a structured, pre-tested interview schedule. The response rate was 99%. Participants were classified as 'ever users' and 'never users' of tobacco. Ever users were further categorized into 'experimenters', 'daily users', 'occasional users' and 'ex-users'. An experimenter was classified as someone who had used a tobacco product on 100 or fewer occasions during their entire life. A daily user had used tobacco products > 100 times during their lifetime and on all days in the past 30 days. An occasional user had

used tobacco products > 100 times during their lifetime, but not on a daily basis during the past 30 days. An ex-user was classified as someone who had used tobacco > 100 times during their lifetime, but stopped using tobacco for more than 30 days.²³

School study

The study was conducted between January and February 2003. Using a 2-stage cluster sampling technique, 1323 boys aged 12–19 years were selected from 45 class divisions of 14 higher secondary schools in Thiruvananthapuram city. Both government and private schools (aided and unaided: Private aided schools are funded by the government but managed by private organizations or individuals while private unaided schools are funded as well as managed by private organizations or individuals) were included in the study. Students were given a pre-tested and confidential, self-administered questionnaire in the classroom and their anonymity was assured. The response rate was 100%. Information on type of tobacco use, frequency of use, initiation to tobacco, reasons for use, tobacco use among friends, family members and teachers were included in the questionnaire. Two categories of tobacco users were defined: smokers and smokeless tobacco users. Smokers were further classified into the following groups:^{23,24}

1. Ever smoker: One who had not smoked in the past 30 days preceding the study but had tried in the past (even one or two puffs);
2. Current smoker: One who had smoked at any time (one or more days) in the 30 days preceding the survey;
3. Never smoker: One who had never smoked.

Smokeless tobacco users were similarly classified.

College study

Between January and February 2000, a survey of the tobacco use habits of college students was conducted in two districts of Kerala: Thiruvananthapuram, the capital and Alappuzha, a coastal district. The districts were selected based on convenience and the colleges and courses were selected based on a stratified random sampling procedure. From a total of 42 and 36 colleges, respectively, in Thiruvananthapuram and Alappuzha districts, 5 colleges each were selected randomly. All the class divisions of the selected colleges were stratified based on the course of study: arts, science, commerce and polytechnic. From each stratum, we randomly selected class divisions (7 each from arts, science and commerce, 9 from polytechnic), and all the 1254 male students (mean [SD] age 18.2 years [1.6]) present in 30 class divisions selected for the survey agreed to participate in the study. Investigators who read out instructions to the students, and were present to answer any questions that arose, administered a pre-tested and confidential questionnaire and their anonymity was assured.

RESULTS

Community study

The sample characteristics of the community study participants are given in Table I.

Prevalence of tobacco use. Ever use of tobacco among the study population was 38% (72% of men and 6% of women). Among men, the prevalence of ever smoking was 55% and ever use of *gutkha* and *khaini* together was 31%. Among men who had ever smoked, 77% were daily smokers, 13% were occasional smokers, 3% were ex-smokers and 7% were experimenters (Table II).

TABLE I. Age distribution of the community study sample

Age group (in years)	Men (n=630)	Women (n=668)	Total (n=1298)
<25	118 (18.7)	194 (29.0)	312 (24.0)
25-44	301 (47.8)	286 (42.8)	587 (45.2)
≥45	211 (33.5)	188 (28.1)	399 (30.7)

Values in parentheses are percentages

Among women, there was only a single smoker (daily user), and a single *thampak* user (occasional user). *Thampak* is the colloquial name for tobacco products available in sachets, e.g. *khaini*, *gutkha*. No woman used snuff while 39 (5.8%) were *pan* chewers and, among them, 61.5% were daily chewers, 23.1% occasional chewers and 15.4% experimental chewers.

The prevalence of consumption of various tobacco products among men of different age groups shows that a significant upsurge in smoking, especially daily smoking, takes place after the age of 24 years (Table III). Also, chewing *thampak* is especially high among the youth in the age group of 15-24 years.

With respect to the educational levels of tobacco users, when men daily smokers were classified into four educational groups, the prevalence rates for smoking and chewing were as follows: education less than grade 5 (52.4%; 14.3%), grade 5-8 (49.3%; 7.1%), grade 9-12 (40.4%; 1.6%) and more than 12 years of schooling (8.8%; 0%). Compared with men with >12 years of schooling, those with <5 years of schooling were 7 times more likely to smoke (OR 7, CI 3.2-15.6).

Age of initiation. In this community-based study, the mean (SD) age at initiation of smoking of men ever smokers aged <25 years (n=31) was 19.2 (1.8) years, for those aged 25-44 years (n=200) it was 21.2 (5.2) years and for those aged >44 years (n=113) it was 25.5 (8.5) years. This suggests a possible trend of decreasing age at onset of smoking—a trend that needs to be validated through a series of cross-sectional studies using larger sample sizes. Another notable observation was that only men aged 16-37 years reported using *khaini* and *gutkha*. At the time this

TABLE II. Product-wise prevalence of tobacco consumption pattern among men

Category of users	Smoking	<i>Pan</i> chewing	<i>Thampak</i> [*] use	Snuff use
	n (%)	n (%)	n (%)	n (%)
Ever user	344 (54.6)	55 (8.7)	195 (31)	23 (3.7)
<i>Subdivisions of ever users</i>				
Experimenter	25 (7.3)	7 (12.7)	8 (4.1)	2 (8.7)
Occasional user	46 (13.4)	11 (20)	69 (35.4)	4 (17.4)
Daily user	264 (76.7)	33 (60)	118 (60.5)	17 (73.9)
Ex-user	9 (2.6)	4 (7.3)	0	0
Total	344 (100)	55 (100)	195 (100)	23 (100)

* Colloquial name for tobacco products available in sachets, e.g. *khaini*, *gutkha*

survey was conducted, *khaini* and *gutkha* were newly introduced into the local market.

Quantity of smoking. The mean number of cigarettes/*beedis* smoked by daily men smokers was 12.6. Daily men smokers were subclassified into 3 categories: low-level smokers (smoking 1-5 sticks per day), medium-level smokers (smoking 6-10 sticks per day) and high-level smokers (smoking >10 sticks per day). Thirty-four per cent of daily smokers were found to be low-level smokers, 28% medium-level and 38% high-level smokers. The average number of sticks smoked by low-, medium- and high-level smokers was 3.5, 8.6 and 23.6, respectively.

Awareness about the health hazards of tobacco. Almost all the study participants reported that they knew that tobacco products were injurious to health in general. However, knowledge of specific illnesses associated with tobacco use was poor. While 46% knew that smoking could cause lung cancer and 32% thought that it causes or could exacerbate asthma, only 10% knew that it causes heart disease, 2% knew that it causes high blood pressure and just 12% knew that exposure to passive smoking could cause disease.

Desire to quit smoking. Among current (daily, occasional and experimenter) men smokers, 83% had the desire to stop smoking and 51% reported that they had tried unsuccessfully to quit smoking. Important reasons for wanting to quit smoking were: growing awareness of the health hazards of smoking (49%), occurrence of tobacco-related illnesses in the person or a family member (29%), lack of money (5%) and family pressure (12%).

School study

The sample characteristics of the male students are given in Table IV.

Prevalence of tobacco use. Thirty-five per cent of the school sample aged 12-19 years had experimented with some form of tobacco, 23.9% with smoking and 10.7% with smokeless tobacco products. Overall, 11.3% of the students were found to be currently using some form of tobacco. The prevalence of current smoking was 8.1% and the current use of smokeless forms of tobacco was 3.2%. The majority of current users—46.7% smokers and 76.7% smokeless tobacco users—had used a tobacco product for between 1 and 7 days in the 30 days preceding the study. On the days when they smoked, the majority (77.6%) smoked between 1 and 5 cigarettes or *beedis* per day.

Table V presents the patterns of tobacco use by age group. Multivariate analysis revealed that the proportion of current tobacco users increased significantly with age. Boys aged 16 years and above were 2.9 times (OR 2.9, CI 1.6-5.3) more likely to be current tobacco users compared to those aged ≤13 years. Across all age groups, the proportion of smokers was higher than users of other tobacco products. Only 3.2% of boys exclusively used smokeless tobacco products such as *pan*, *pan masala* or *khaini*, but 40% of current users reported using multiple products. How-

TABLE III. Percentage of men in different age groups using various tobacco products

Age group* (in years)	Smoking		<i>Pan</i> chewing		<i>Thampak</i> use†		Snuff use	
	Daily	Not daily‡	Daily	Not daily	Daily	Not daily	Daily	Not daily
15-24 (118)	5.1	21.2	0.8	0.8	33.9	11.9	0	0
25-44 (301)	58.5	7.6	2.7	3.3	25.9	20.9	1.0	1.3
≥45 (211)	38.9	10.9	11.4	3.3	0	0	6.6	0.9
Total (630)	41.9	11.3	5.2	2.9	18.7	12.2	2.7	1.0

* Sample size of each subcategory is placed within parentheses † Colloquial name for tobacco products available in sachets, e.g. *khaini*, *gutkha* ‡ Not daily users include occasional users and experimenters

TABLE IV. Characteristics of the school study sample (n=1323)

Variable	School			Total
	Government (n=418)	Private aided (n=461)	Private unaided (n=444)	
Age (in years)*				
≤13	88 (21.1)	81 (17.6)	121 (27.3)	290 (21.9)
14	108 (25.8)	142 (30.8)	127 (28.6)	377 (28.5)
15	81 (19.4)	83 (18)	48 (10.8)	212 (16)
≥16	141 (33.7)	155 (33.6)	148 (33.3)	444 (33.6)
Ever use of tobacco				
Yes	158 (37.8)	199 (43.2)	101 (22.7)	458 (34.6)
No	260 (62.2)	262 (56.8)	343 (77.3)	865 (65.4)
Current tobacco use				
Yes	52 (12.4)	73 (15.8)	25 (5.6)	150 (11.3)
No	366 (87.6)	388 (84.2)	419 (94.4)	1173 (88.7)
Tobacco use in family				
Nobody	213 (51)	243 (52.7)	285 (64.2)	741 (56)
Father	171 (41)	171 (37.1)	95 (21.4)	437 (33)
Others	34 (8)	47 (10.2)	64 (14.4)	145 (11)
Tobacco use among teachers				
Yes	192 (45.9)	172 (37.3)	126 (28.4)	490 (37)
No	77 (18.4)	90 (19.5)	55 (12.4)	222 (16.8)
Don't know	149 (35.6)	199 (43.2)	263 (59.2)	611 (46.2)
Tobacco use among friends				
Yes	269 (64.4)	272 (59)	134 (30.2)	675 (51)
No	75 (17.9)	88 (19.1)	127 (28.6)	290 (21.9)
Don't know	74 (17.7)	101 (21.9)	183 (41.2)	358 (27.1)

Values in parentheses are percentages * Age in completed years

ever, among 13-year-olds, *pan* was used more than any other product and appears to be a starter product for an increasing number of the youth. *Khaini* was the second most used tobacco product after cigarettes among those ≥16 years of age.

The impact of social influences on tobacco uptake was investigated. Boys whose fathers were current users of tobacco were found to be 2 times (OR 2.0, CI 1.3–3.1) more likely to be using tobacco themselves (16.7%) compared to boys in whose families nobody used tobacco (7.3%). Those having friends who were current tobacco users were 2.9 times (OR 2.9, CI 1.6–5.1) more likely to use tobacco themselves compared to those whose friends were not using tobacco.

Age at initiation. An analysis of survey data suggests that changes may be occurring in the age at initiation. The mean age at initiation to tobacco in the entire group of ever users was 12.1 years, whereas it was 10.7 years among those ≤13 years of age, 11.5 years among 14-year-olds, 11.8 years among 15-year-olds and 13.2 years among those ≥16 years of age. Of ever tobacco

users, 15.3% had tried smoking by the age of 10 years and 7.4% had tried chewing by the age of 10 years.

Perception of harm. The majority of participants (94.3%) reported that they knew that tobacco use was harmful to health. When asked about the relative harm of different tobacco products, 64% reported that cigarettes were the most harmful of all tobacco products while 26% and 6.1% reported chewing tobacco and snuff, respectively, to be the most harmful. At the time of the survey a ban against smoking in public places had been introduced in Kerala. Eighty-three per cent of the participants were aware of the ban, and 90% of them stated that they supported it.

College study

Prevalence of tobacco use. Overall, 37% of men college students had experimented with some form of tobacco, 31.6% with smoking (cigarette or *beedi*) and 5.2% with other tobacco products. In the past 30 days, 13.6% of students had used some form of tobacco. The overall prevalence of current smoking was 11.7% and current chewing (*gutkha* or *Shambu*—the most popular brand of *khaini*) was 1.9%. Multivariate analysis revealed that the proportion of current tobacco users increased significantly with age. Students aged 18–19 years were more likely to be currently using tobacco than students aged <18 years, while those (OR 4.3, CI 2.6–7.1) ≥20 years of age were more likely (OR 7.8, CI 4.5–13.7) to be currently using tobacco compared with those <18 years. Tobacco use among commerce students was 29.1% compared with 5.3% among polytechnic students (p<0.001; Table VI).

Age at initiation. The mean age at initiation of smoking cigarettes and *beedis* in this college population as a whole was 16.1 years and 14.9 years, respectively, whereas for chewing *gutkha* and *Shambu* it was 16.8 years and 16.2 years, respectively.

TABLE V. Current tobacco use by age and different products in the school study

Product used	Age (in years)			
	≤13 (n=290)	14 (n=377)	15 (n=212)	≥16 (n=444)
<i>Pan</i> (n=38)	6 (2.1)	7 (1.9)	10 (4.7)	15 (3.4)
<i>Pan masala</i> (n=57)	4 (1.4)	14 (3.7)	12 (5.7)	27 (6.1)
Snuff (n=7)	1 (0.3)	1 (0.3)	1 (0.5)	4 (0.9)
<i>Gutkha</i> (n=15)	1 (0.3)	0	5 (2.4)	9 (2.0)
<i>Khaini</i> (n=35)	1 (0.3)	3 (0.8)	10 (4.7)	21 (4.7)
Cigarettes/ <i>beedis</i> (n=107)	9 (3.1)	19 (5)	19 (9)	60 (13.5)

Values in parentheses are percentages

TABLE VI. Percentage of current tobacco users by course of study in the college study

Age (in years)	<18	18–19	≥20	Total
All Courses	4.1 (492)	16.8 (530)	26.7 (232)	13.6 (1254)
<i>Course of study</i>				
Arts	3.8 (156)	10.3 (117)	24.2 (120)	12.0 (393)
Science	3.6 (56)	12.0 (75)	33.3 (12)	10.5 (143)
Polytechnic*	0 (145)	13.9 (137)	17.6 (17)	5.3 (419)
Commerce	8.9 (135)	24.4 (201)	31.3 (83)	29.1 (299)

Values in parentheses are the sample size in each category

* Students of polytechnic and industrial training institutes, where engineering subjects are taught leading to a award of a diploma

Social influences. Close to half the students reported having a household member who regularly used some form of tobacco. Those having a household member using tobacco were more likely (OR 3.3, CI 2.3–4.8) to be currently using tobacco themselves compared to those in whose families nobody used tobacco. Students whose fathers were current tobacco users were more likely (OR 1.9, CI 1.3–2.6) to be currently using tobacco compared to those whose fathers did not. Students having a best friend who used tobacco were more likely (OR 3.1, CI 2.0–4.9) to be currently using tobacco compared to those whose friends did not.

Perception of health risk and addiction. Three-fourths of the study participants reported that any form of tobacco use was harmful to health, with only 11.8% of current tobacco users reporting it to be harmful compared with 88.8% of non-users. Participants were asked to rank tobacco products according to relative harm—*Shambu* was reported to be the most harmful by 37.5% of students, *gutkha* by 17.1%, filter-tipped cigarettes by 13.4%, non-filter tipped cigarettes by 13.6% and *beedis* by 16.1% of the students. Ranking for the second most harmful tobacco product was reported as follows: *Shambu* by 23.8%, *gutkha* by 17.1%, filter-tipped cigarettes by 14.5%, non-filter tipped cigarettes by 16.4% and *beedis* by 20.9% of the students. Twenty per cent of current tobacco users reported feeling 'addicted' to their tobacco habit and 15.2% reported that they had tried to quit recently, but were unsuccessful.

DISCUSSION

Tobacco consumption is a major public health problem in India. This article summarizes what we know about tobacco use in the state of Kerala through a review of the existing literature and a summary of 3 recent unpublished studies, 2 of which focus on the youth. A review of the literature shows that we have only limited information on tobacco use. While prevalence data exist, we have little information on age at tobacco uptake, levels of tobacco use among different age groups, and product preference by different age groups in a dynamic market subject to the introduction of new products and marketing campaigns targeting particular market niches. Findings from the 3 recent studies add to our broader understanding of tobacco use in Kerala, suggest new tobacco use trends among the youth and identify important issues for further research.

Our data suggest that the age at initiation of both smoked and chewed tobacco products appears to be falling. To know whether this is actually the case, we need to conduct a series of cross-sectional studies with larger samples of the youth. Smokeless tobacco products such as *khaini* (tobacco flakes with slaked lime and aromatic spices) and *gutkha* (tobacco with betel nut) are available in small attractive sachets at low prices and are reported to be growing in popularity among children and adolescents.^{8,14,25,26}

The degree to which chewed products become starters for later smoking needs to be examined, as does co-product use.

Cigarette is the most popular tobacco product among college-going youth. Our survey data suggest that significant differences in rates of smoking exist between populations of students registered for different courses of study. This suggests that we need to focus on particular colleges that may provide an environment of risk and where smoking appears to be 'normal'. Other 'youth spaces' could be located including secondary schools where tobacco use is more likely to occur.

Our data also suggest that the tobacco use habits of fathers and peers influence youth smoking. This underlines the importance of tying smoking/chewing prevention and cessation efforts closely together. Sons seeing fathers quit smoking might be less inclined to take up smoking. This hypothesis needs to be tested.

Almost all the youth stated that they knew tobacco was harmful for health. We discovered, however, that their sense of risk was general and poorly informed. Efforts at education clearly need to both expand awareness about the harm of tobacco beyond cancer and focus on misconceptions about the relative harmfulness of different tobacco products.

Many youth who use tobacco products have already contemplated quitting. However, poor rates of success suggest that those who wish to quit need assistance in doing so. Research into how to assist them to quit is required, beginning with an assessment of what led to past quit experiences and what led to a relapse.

The last important finding of our recent studies of tobacco use among youth is that despite the ban introduced against restrictions on sale of tobacco products to minors (<18 years of age), students still appear to have ready access to tobacco products. Clearly we need to reinforce this ban. It is encouraging to know that the vast majority of youth recognize the importance of introducing a ban and support government efforts to control tobacco product advertising and sale to minors, particularly near schools.

Limitations

As the self-reported tobacco use status was not verified by a urinary cotinine test, there is a possibility of reporting bias, although self-reports are reliable and commonly used in epidemiological research.^{27–29} Considering the taboo on tobacco use among women in Kerala, there is a possibility that tobacco use prevalence among women was underestimated in our study.

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