CONSUMPTION OF TOBACCO PRODUCTS IN A RURAL COMMUNITY IN KERALA

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CERTIFICATE

This is to certify that the dissertation titled **CONSUMPTION OF TOBACCO PRODUCTS IN A RURAL COMMUNITY IN KERALA,** is an authentic record of the work carried out by **Dr.A.S.Pradeep Kumar** under our supervision and guidance for the fulfillment of the **Master of Public Health** Degree examination and that not part thereof has been presented for any other degree.

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CONTENTS

Abstract

Objectives: The main purpose of this study was to find the epidemiology of tobacco use and the impact of socioeconomic factors on it. The other objectives were to assess the level of nicotine dependency among the smokers; the knowledge of people about the health hazards of tobacco use and their attitude towards the legal restrictions on use and sale of tobacco.

Methodology: This was a cross sectional survey with a semi structured pre-tested questionnaire in a rural panchayath in Kerala. The cluster sampling was used to identify the study households in each ward and executed the survey through 6 health workers during January and February of 1999. The Fagerstrom scale was used to assess the nicotine dependency among the smokers.

Results: The prevalence of tobacco use in any form was 36.9 per cent (70.8 per cent among men and 4.9 per cent among women), of smoking was 26.0 per cent (53.3 per cent among men and 0.1 per cent among women), and of smokeless form was 10.9 per cent (17.5 per cent among men and 4.8 per cent among women). The prevalence of pan chewing was 6.3 per cent, of khaini use was 10.2 per cent and of snuff use was 1.8 per cent. The people with 6 and above nicotine dependency score were 15.8 per cent. The share of expenditure of smoking on the total tobacco expenditure of the survey population was 73.7 per cent. The proportion of people knew that the tobacco habit has hazards was 99.4 percent but the per cent of smokers know that smoking is a cause of lung cancer is 48.4, mouth cancer is 8.6 and heart disease is 10.4. The per cent of tobacco users agrees for the ban on tobacco advertisement, ban of tobacco sale to children and ban on the use in public places is more than 75.

Conclusion: There is a need for programmes to reduce the tobacco use especially smoking and khaini use. The smokers need de-addiction facilities to give up smoking. The health education programmes need to be strengthened to enhance the knowledge of health hazards of tobacco.

CONSUMPTION OF TOBACCO PRODUCTS IN A RURAL COMMUNITY IN KERALA

1. INTRODUCTION

1.1. Background

Consumption and use of tobacco products do not seem to have any geographic boundaries or sex barriers[1] and the entire world is now experiencing an increased use of tobacco products than ever before. As a fall out, the tobacco related deaths are on the rise worldwide and it is being projected that the tobacco use might very well be the largest killer in the world by the year 2020. The tobacco deaths in the developed countries increased by 2.5 times among men and 9.0 times among women during the second half of the present century alone[2]. In other words, 20 per cent of all reported deaths among men and 4 per cent among women during this period were due to tobacco use and it works out to be 30 per cent and 7 per cent of all deaths respectively for men and women in the 35-69 age group. The developed world alone contributes 61 per cent to the world's tobacco deaths as of now. The developing world is not left far behind and it is expected that the ratio between the developed and the developing world would be reversed by the year 2020.

In India, 50 per cent of all cancers among men and 20 per cent among women are attributable to tobacco use[3]. One-third of all cancers in India is reported to be oral

cancer and 90 per cent of oral cancer patients are found to be tobacco users[4]. In addition, 60 per cent of heart patients under 40 years of age use tobacco products[4]. The prevalence of tobacco use in the country is reported to be relatively more in rural areas and this is true for the state of Kerala as well[5].

In addition to the growth of tobacco use *per se*, the variety space of the tobacco products too appears to have been expanding in the recent past with the advent of newer forms of tobacco products. The major disadvantage of these new products is that the users would not know their harmful effects. Worse still is the fact that many of these new products are unknown to the policy makers and these new varieties often find their way into the hands of the teenagers.

1.2. The Problem

The tobacco use has been expanding in space, magnitude and variety and its harmful impact on the society is already visible in the form of increased tobacco related deaths. The advent of newer varieties of tobacco products is potentially dangerous especially when the youth start using them. Further increase in the use of tobacco products is expected to considerably alter the epidemiological and economic profiles of the community at large and all the new adverse developments in this arena would only complicate the issue further. The increased tendency to use tobacco products among the youth and the rural folk should be arrested forthwith if one wants to alter the upward trend in the tobacco related deaths. The fact that tobacco use is one of the preventable causes of mortality gives rise to the scope that the problem at hand is solvable, provided adequate policy measures are introduced in time to check the growth of this preventable cause of death called *tobacco use*.

In order to initiate a policy dialogue, it is important to document the magnitude and the pattern of tobacco use especially among the rural people and the youth. The

development and the extent of use of newer varieties need to be brought out if we want to address the issue of tobacco use in *toto*. The problem at hand is manifold if we desire to study and estimate the entire magnitude of tobacco use. The magnitude has both epidemiological and economic sides. In the epidemiological side, the prevalence of tobacco use today will indirectly tell us the prevalence of many diseases in future.

Economically speaking, the tobacco use has direct and indirect consequences both in the short run as well as in the long run. The direct short run economic impact appears in the form of changes in the household budgetary allocations in favor of tobacco consumption. By earmarking part of the household budget for the consumption of tobacco products, the household has to forego the consumption of certain essential commodities. The direct long run economic consequence occurs through the loss of productivity owing to diseases attributable to the tobacco use. The indirect economic consequence is caused at the family level if the labor substitution occurs at that level due to the productivity loss suffered by the affected individual.

Of late, the policy makers worldwide have began to recognize the adverse consequences of tobacco use and are imposing several legal restrictions on the sale and use of tobacco. As a result, the prevalence of tobacco use has started showing the declining trend in some parts of the world. Although this is true with respect to the developed world, the story is different in majority of the developing countries. For instance, the legal restrictions pertaining to tobacco use in India are inadequate and as a consequence, the prevalence still remains high because the multinational companies promoting tobacco products are relocating in developing countries such as India due to stringent regulations in their home countries. They are targeting the youth and women to enhance their market through innovative products with less tar/nicotine content and/or with flavors.

From the preceding analysis, it is clear that the policy dialogue has two dimensions - one is related to the profile of tobacco use and the other is the legal dimension. First of all, tobacco use as a public health problem, has to be established by way of estimating its prevalence, and spread. Having done this, the next task is to elicit public opinion regarding the legal aspects of the tobacco use. This is important if we want to control the use of tobacco to any considerable extent. The knowledge of the relative levels of nicotine dependency, the awareness of health hazards and opinions on legislation will help the authorities to formulate suitable programmes for the control of tobacco use.

The main purpose of the present study was to estimate the magnitude of the problem concerning all forms of tobacco use - smoking or smokeless. The study also aimed to estimate the expenditure towards the consumption of tobacco products. In addition to this, opinion regarding the legal action was sought from both tobacco users and non-users. The study was conducted in a rural place in the capital district of Thiruvananthapuram in Kerala. Although Kerala model of health care is being widely referred to, it is not yet established whether the state deviates away from the national trend in terms of tobacco use and the newer varieties of tobacco products are yet to be exposed in great detail. However, some information is available on the prevalence of tobacco use; the prevalence in a part (Ernakulam) of Kerala during 1960-70 was reported to be 59 per cent for men and 39 per cent for women[6]. The men predominantly used smoking tobacco (45 per cent) and the women mostly used chewing type (38 per cent). A recent report of the Steering Committee on Health submitted to the State Planning Board of Kerala has advocated the conduct of a survey in Kerala to know the depth of the problem concerning the tobacco use[7]. This emphasizes the seriousness of this problem now in a state like Kerala. The Regional Cancer Centre in

Thiruvananthapuram has attempted to conduct such a study on the prevalence of tobacco use in an urban area; but the study could not be completed for various reasons.

1.3. The Objectives

As said above, the main purpose of the study was to estimate the magnitude and spread of tobacco use in a rural community in Kerala. The specific objectives of the study are

1) to measure the prevalence of tobacco use in its various forms in the community;
2) to study the impact of socioeconomic status on tobacco use;
3) to evaluate the levels of nicotine dependency among the smokers;
4) to know their awareness level about the health hazards of tobacco use with an aim to formulate appropriate intervention strategies to discourage the tobacco use; and
5) to elicit public opinion regarding legislation concerning the promotion of tobacco use.

1.4. The Literature

The various studies in the literature on tobacco use can be broadly categorized under three major heads viz., prevalence, health hazards, and the behavioral aspects. According to WHO estimates[4], 65 per cent of males and about 33 per cent of females in India use some form of tobacco. Among males 35 per cent use smoking type, 22 per cent use smokeless tobacco and 8 per cent use both; among females only 3 per cent use smoking type and remaining persons use the chewing type. Another study covering 5

cities in India showed that smoking (20.7 per cent in males and 1.6 per cent in females) and chewing (13.3 per cent in males and 10.7 per cent in females) are the more common forms of tobacco use in India[8]. The same study revealed that the overall prevalence of tobacco use was significantly higher among males than among females (27.5 per cent and 11.6 per cent). The prevalence of any form of tobacco use in rural India, among people above 15 years during 1988 was found to be 55.4 per cent among men and 16.4 per cent among women (Table-1.1) [5,9]. Chewing tobacco is the commonest form of smokeless tobacco use among men and women both in rural and urban areas. Eventhough tobacco use has increased several fold among men than women both in

Table 1.1. The percentage of regular tobacco users in India (1988)

Above 15 years

Type of tobacco	Rural		Urban	
	Men	Women	Men	Women
Smoking	39.1	3.6	28.1	1.1
Smokeless only	16.3	12.8	8.6	7.1
Any form	55.4	16.4	36.7	8.2

Below 15 years

	Rural	Urban
Boys	1.4	0.6
Girls	1.2	0.6
Total	1.3	0.6

15 to 24 years

	Rural	Urban
Males	2.26	1.09
Females	0.50	0.21
Total	1.41	0.67

Source: SAARC (1995) **Tobacco Control – An International Journal**, vol.1 (3), p196

rural and urban areas, prevalence of any form of tobacco use is more common in the rural areas. It has been observed that 1.4 per cent of the rural youth and 0.6 per cent of the urban youth start using tobacco every year.

Marked variation in the prevalent rates among different states in India was reported[6] and the pattern of use of different tobacco products was not similar across the country. The prevalence of chewing type of tobacco among men during 1960-70 was found to be 4 per cent in Srikakulam (in the state of Andhra Pradesh) while it was 53 per cent in Pune (in Maharashtra) and among women, the prevalence fell in the range of 3-49 per cent (Table-1.2). The prevalence of smoking was found to be in different order; it was 6 per cent in Pune and 70 per cent in Srikakulam among men. Among women, it was found to be nil in Pune where as it was 64 per cent in Srikakulam. Between 2 and 26 per cent of the men used both the types of tobacco where as similar range for women was very narrow (1-2 per cent).

Table-1.2.The prevalence (in per cent) of tobacco use in India during1960 and 1970.

Area	Men			Women		
	Chewing	Smoking	Use of Both	Chewing	Smoking	Use of Both
Bhavnagar	9	56	6	15	-	-
Ernakulam	14	45	22	38	1	1
Srikakulam	4	70	7	3	64	-
Singhbhum	17	50	14	26	5	2
Darbhanga	28	24	26	7	41	1
Pune	53	6	2	49	-	-
Manipuri	21	41	20	9	11	1

Source:WHO(1988) '**Smokeless tobacco control** – Technical report series – 773',WHO Geneva, p31

The prevalence of any form of tobacco use in Kerala among people above 15 years in rural area in 1988 was 44.6 per cent among males and 13.4 per cent among females (Table-1.3) [5,9]. Like in other parts of the country, tobacco use is relatively more prevalent in the rural area in this state as well and it was found that 0.5 per cent of the rural youth and 0.3 per cent of the urban youth start using tobacco every year. The KSSP study[10] has estimated that the prevalence of tobacco use in rural Kerala as 53 per cent among males above 15 years of age during 1987. The prevalence of chewing and snuff use among people above 15 years of age were reported as 13 per cent and 2 per cent respectively.

Table 1.3. The percentage of regular tobacco users in Kerala.(1988).

Above 15 years

Type of tobacco	Rural		Urban	
	Men	Women	Men	Women
Smoking	39.4	0.8	34.9	0.7
Smokeless only	5.2	12.6	2.9	6.1
Any form	44.6	13.4	37.8	6.8

Below 15 years

	Rural	Urban
Boys	0.1	0
Girls	0.1	0
Total	0.1	0

15 to 24 years

	Rural	Urban
Males	1.02	0.62
Females	0.03	0.0
Total	0.50	0.30

Source: SAARC (1995) **Tobacco Control – An International Journal**, vol.1(3), p204.

1.4.1. Health hazards

A sixteen-year prospective study in Shanghai in China showed that cigarette smoking was a major cause of death and about 20 per cent of all deaths during 1980s were due to smoking[11]. Another 20 year cohort study completed in August 1996 projected that 50 per cent of 300 million smokers in China will die out of smoking related diseases if urgent steps are not taken to control tobacco use[12]. This holds good for India also[13]. Prevalence of hypertension was found to be more among smokers and greater among heavy smokers indicating a linear correlation between BP levels and smoking[14].

The persistence and incidence of respiratory symptoms like chronic cough, chronic phlegm, wheeze and attacks of breathlessness are 50 per cent less in ex-smokers when compared to those continue to smoke[15]. Nevertheless, this is only possible to a lesser extent in people who smoked more cigarettes and for those who started smoking at an early age. The relative risk of prolonged respiratory disease symptoms due to ETS (Environmental Tobacco Smoke) exposure during childhood was 1.09 (95 % CI is 0.69-1.79); during adult life, it was 1.28 (95% CI is 0.9-1.79) and during childhood and adult life is 1.72 (95% CI is 1.31-2.23) [16]. Also, it has been shown that regular smokers would have lower BMI than never smokers but heavy smokers did not have lower BMI than light smokers[17]. Among ex-smokers, men will have higher BMI than never smokers. Smoking and higher BMI are 2 risk factors for heart disease. The prevalence of smoking among Swedish men declined over 20 years between 1963 and 1983 and, as a result, it is now predicted that the lung cancer rate among Swedish men will decline between the years 2000 and 2010[18].

Racial and ethnic differences in health hazards owing to tobacco use have been reported and it has been shown that smoking of equal number of cigarettes would lead to

higher serum concentration of cotinine in blacks when compared to whites[19]. Women are more sensitive than men to some deleterious effects of smoking[20]. Even though the prevalence of smoking will be higher among people living in a deprived area, the adverse health effects in deprived regions is mainly due to low socioeconomic status[21].

1.4.2. Behavioral pattern

In the US, the tobacco companies target the youth through 'motor racing' and as a result, a survey revealed that 54 per cent started smoking at the age of 10-13 years[22]. For India, a study in Tamil Nadu (Madurai) suggested that promotion of tobacco-free life style should go along with the cultural and arts events[23]. In another study of youth in the age group of 21-35 years again in Madurai City, they found that 67 per cent of the youth are prone to smoking and they first acquired the smoking habit at the age of 16-21 years[24]. In rural Tamil Nadu, tobacco-chewing habit among the women was shown to have started at the age of 14-18 years[25].

Studies are also available with regard to the awareness regarding the tobacco hazards. A recent study in the state of Tamil Nadu in India revealed that 57 per cent of the respondents thought that chewing tobacco is essential to strengthen the teeth and for the betterment of digestion. Another 41 per cent of them thought that chewing tobacco is essential for normal pregnancy[25].

1.5. Poisonous contents and harmful effects of tobacco

The tobacco content in a normal sized cigarette is about 700 mg and in a bidi, the same is about 142 mg (Table-1.4). Although tobacco content is relatively less in a bidi, the tar content in it is much higher[26]. Burning a cigarette will emit a large number of chemicals either through the main stream smoke or through the side stream smoke. The smoke that enters into the mouth and chest through the back end of the cigarette while drawing the air into the mouth is the main stream smoke. The smoke that passively

spreads into the atmosphere from the burning end is the side stream smoke. Tobacco smoke is an aerosol containing particles composed of liquid droplets dispersed in gas. There are about 4000 chemicals, of which many are asphyxiants, irritants,

Table-1.4. The tar and nicotine content (in mg) of cigarettes and bidis.

	Tar	Nicotine
Cigarette	1.8-2.8	0.9-1.8
Bidi	45-50	-

Source: IARC, 1986, **IARC Monograph on Tobacco Smoking**, Vol. 38, IARC, Lyon.

carcinogens and co-carcinogens. The particle size in the main stream smoke is between 0.15 μm to 1.3 μm with a mean of 0.4 μm and in the side stream smoke is between 0.01μm to 0.1 μm. These particles are small enough to reach even in the alveoli. The deposition at different areas of the lung may initiate the cancerous growth. The various smoke constituents will dissolve in blood and will reach to different parts of the body and will initiate the diseases.

In smokeless tobacco products, there are about 2500 chemicals and many are irritants, carcinogens and psychoactive substances. The smokeless tobacco products contain as much as or more nicotine than that present in cigarettes[27]. Snuff contains added sugar in the form of fructose, up to 10%. Sometimes, snuff may contain metals like copper, chromium, zinc and nickel. The nicotine content in one gram of a dry snuff is 12.4–15.6 mg and it is 14.6-36.7 mg in the case of moist snuff[28].

Tobacco use exposes the user to thousands of chemicals, predisposes him/her to a number of diseases and addiction to nicotine. Recurrent respiratory infection, chronic bronchitis, emphysema and Bronchial asthma are the hazards to the respiratory system caused by smoking. Chronic bronchitis and emphysema obstruct the passages of the lung (COPD) and cause breathlessness. Among the tobacco-related deaths, death due

to heart diseases is the most important one. Both nicotine and carbon monoxide are responsible for heart disease and peripheral vascular disease. Smoking tobacco will lead to Coronary heart disease and Hypertension. Smoking has a significant relationship with Atherosclerosis, which is main cause for Peripheral vascular disease. Aortic aneurysm is the other disease due to smoking. Smoking is the cause of more than 50 % of deaths due to stroke. Smoking can also cause Toxic Amblyopia and blindness.

Tobacco use is the major cause of many cancers. About 90 per cent of lung cancer is caused by smoking and about 90 per cent of the oral cancer is attributable to tobacco use. Oral cancers include cancer of lips, tongue, gums, buccal mucosa, palate, salivary glands, floor of mouth and oropharynx. In addition to these, tobacco use is a cause for cancer of larynx, oesophagus, pancreas, bladder and kidney.

Table.1.5. Deaths during 1995 (in per cent) caused by smoking by sex and cause of death in developed countries.

Sex	all causes	all cancer	Lung cancer	upper aerodigestive cancer	other cancer	COPD	other respiratory disease	vascular disease	other causes
Men	25	43	92	66	15	75	14	21	18
Women	9	13	72	36	2	53	7	6	7
Both	17	30	87	60	8	66	10	13	12

Source: WHO. (1997) Tobacco **or health: A global status report**. WHO Geneva, p45.

Smoking increases the risk of infertility and tobacco use during pregnancy is associated with low birth weight, stillbirth and increased perinatal deaths. Menstrual disorders are more common among smokers. The risk of passive smoking depends on the composition of environmental tobacco smoke, which contains main stream smoke

exhaled by smokers and side stream smoke emitted from the burning end of tobacco. Environmental tobacco smoke is an increasing concern of all diseases of smokers to

Table.1.6.Estimated deaths caused by smoking in developed countries between1950and 2000.

Mid-decade	Men		Women	
	% of all deaths	% of deaths between ages 35 and 69	% of all deaths	% of deaths between ages 35 and 69
1955	10	20	<1	2
1965	17	28	2	4
1975	21	31	3	7
1985	24	35	6	11
1995	25	36	9	13
Total	20	30	4	7

Source: WHO (1997) **Tobacco or health : A global status report**, Geneva, page 44

non- smokers. The children and pregnant women are greater sufferers. Table-1.5 brings out the effect of tobacco consumption.

The smokeless tobacco products are not free from health hazards. It is well known that these products cause cancers of oral cavity, nasal cavity, pharynx, larynx, oesophagus, pancreas and urinary tract. In addition they may produce pre cancerous and non-cancerous lesions of mouth. Smokeless tobacco causes hypertension and it has now been established that consumption of khaini causes mouth cancer and submucosis fibrosis - a pre cancerous lesion[29]. The less conclusive results suggest that smokeless tobacco products have links with heart disease, peripheral vascular disease, hypertension, peptic ulcer and fetal toxicity. The causal relationship between smokeless tobacco products and oral cancer holds good for snuff, betal quid with tobacco and khaini. A 10 year follow up study in 1980, on 10000 people in Ernakulam (in Kerala,

India) showed all new oral cancers among tobacco chewers[30]. Another study in India among 57518 individuals showed all new oral cancers only in chewers or smokers of tobacco[31].

1.5.1. Nicotine dependency

Nicotine is powerfully addictive product present in tobacco. Nicotine, an alkaloid and a potent psychoactive substance, is the major constituent of all tobacco products that stimulate the people to use it repeatedly. Nicotine is rated as more addictive than Heroin, Cocaine and Marijuana. Even if the tobacco users want to quit, many will not succeed due to the strong addiction liability of the product. When tobacco is mixed with lime for chewing or smoke cigars or pipes, nicotine is released in the form of free base, which will be rapidly absorbed in the mouth. The burning cigarette will release nicotine in the acidic form, which will be absorbed from the lungs.

The smokeless tobacco products also contain equal or more quantity of nicotine than cigarettes. The nicotine present in smokeless tobacco products can also produce nicotine addiction as that of smoking. The blood levels of nicotine in smokeless tobacco users are as high as or higher than that of tobacco smokers.

1.5.2. Disease burden

In 1995, 2.5 million males and 0.6 million females died of tobacco use in the world (Table-1.7). The estimated number of deaths owing to tobacco use in 1995 was 1.915 million (1.44 million males and 0.475 million females) in developed countries and 1.21 million (1.095 million males and 0.115 million females) in the developing countries.

Table.1.7. Deaths (in thousands) owing to tobacco use in 1995

Countries	Men	Women	Total
Developed Countries	1440 (56.8)*	475 (80.5)	1915 (61.3)
Developing Countries	1095 (43.2)	115 (19.5)	1210 (38.7)
World	2535 (100)	590 (100)	3125 (100)

Note: * Figures in parentheses are percentages.
Source: WHO (1997) **Tobacco or health : A global status report**, Geneva, page 47

1.5.3. Stages of Tobacco Epidemic

The tobacco use is considered as an epidemic that will kill thousands and will produce disability in thousands. There will be a long delay for the onset of health effects after the onset of tobacco use. The risk of cancer of lung depends on the duration of smoking. So the current lung cancer rates will be proportional to the smoking habit of 2 or 3 decades before. Initially the prevalence of smoking will increase among men to a maximum level of 60 to 70 per cent. The deaths from smoking will start 2 or 3 decades later among men. The same phenomenon will occur in the same manner among women after an interval of 15 to 20 years. The levels of maximum prevalence may be less among women. During the third stage, the prevalence will decline among men but the death rate will continue to rise. The same thing will happen among women in the fourth stage.

By the year 2000, there would be 2 million tobacco-related deaths in the world annually. By 2020 and 2030, it would be 10 million annually in the world and of these 7 million would be in the developing world. There have been no published projections along these lines with respect to India in general or Kerala specifically.

1.5.4. Economic Consequences

In addition to the cost of tobacco products, the use of tobacco also induces medical care demand and the related cost is also fallout of tobacco use. Absenteeism

from work due to tobacco related illnesses will cause damage to the earnings of the affected individual and in addition, it will also affect productivity decline in the long run. Again, there will be indirect costs caused by fires and accidents. The other costs include the cost of time spent on smoking and the cost related to the maintenance of cleanliness. Some of the costs are indirect by nature and few of them appear to be invisible. Still, the economic cost of tobacco use to the individual and to the community at large is significant and has got a spiral effect.

The World Bank estimation in 1994 shows that there is a net global loss of US $ 200 000 million per year due to tobacco use and half of it is in the developing countries[32]. This includes the cost of medical care, absenteeism from work, fire losses, reduced productivity and income loss due to early death. In addition to this there will decreased quality of life of smokers and the relatives who suffer from the deleterious effects of passive smoking.

The above are the negative consequences of tobacco consumption to the concerned individuals and the society at large. There is one more economic dimension of tobacco use. Production of tobacco products in some countries positively contributes to the national income in a more direct sense. More specifically, this holds good for China, U.S.A. and India occupying the first three places in the world[33]. These countries respectively contribute 36.3 per cent, 11.2 per cent and 8.3 per cent to the world raw tobacco production. Nevertheless, the export earnings by the tobacco is far too less in those countries. The share of tobacco in the respective country's total export earning is a mere 0.68 per cent in China, 0.70 per cent in U.S.A. and 0.50 per cent in the case of India. Purely in terms of export earnings, Malawi stands out; Malawi earns 64.1 per cent of its export revenue from tobacco. The share of tobacco in the export earnings is also considerable (23.5 per cent) in Zimbabwe also. Therefore, the economic

dependence on the tobacco product is not that alarming in India in the sense that stopping the production of tobacco products may not affect the economy to any considerable extent. Hence, even with restrictions on tobacco trade, the country may not loose out much in terms of trade. At the micro level, farmers who cultivate tobacco will be affected and there should be additional costs involved in rehabilitation of these farmers and providing them with alternative means for livelihood.

Even so, in essence, in India, the economic gain of a ban on tobacco would outweigh the economic loss owing to the loss of tobacco trade[34]. A conservative estimate, based on the impressions of a number of clinicians, of the cost of treatment of three major tobacco related diseases, (namely, cancer, heart disease and bronchitis) is that it costs the government about Rs. 24,190 million (US $ 1422.8 million) annually. This is Rs. 6,850 million (US $ 402.9 million) more than the revenue and foreign exchange provided by tobacco to the government[35].

1.6. Forms of tobacco products

In this section, we shall review different forms of tobacco products available for use in the community and their harmful biochemical contents. Broadly speaking, there are two categories of tobacco products viz., smoking and smokeless and there are quite a few sub categories within these broad categories mainly in differentiated forms. The smoking form consists of *cigarettes, cigars and pipes* and the cigarettes themselves are of two types such as the manufactured cigarettes (filter tipped or plain end) and *bidis* (a local cheap substitute for a cigarette). A bidi contains 0.2-0.3 gm of tobacco wrapped in *temburni* leaf and tied with a small string[36]. The smokeless tobacco products include *chewing type or snuff*. The chewing type is usually termed as *pan* (betel quid) and the pan may or may not contain tobacco in it. The commonly used pan is a mixture of tobacco, areca nut and lime wrapped in a betel leaf and it sometimes contains a flavor

too. Snuff, on the other hand, can be a dried or a moisturized one. The dry snuff is powdered tobacco for oral or nasal use and the moisturized one is ground tobacco to be kept in-between cheek and gum.

Other forms of smokeless tobacco products include *khaini, mishri, zarda, shammah,* and *nass (naswar)*. Here, *khaini* is a tobacco-slaked lime mixture; *mishri* and *zarda* are tobacco-only preparations; *shammah* is a dry snuff with slaked lime; and *nass* is a mixture of tobacco, ash, slaked lime and some unknown ingredients. Now, khaini is also available in Kerala in different packages♠. Khaini products were not available in Kerala till recently and now it is made available everywhere. It is available in different brand names like *shambu, pan parag, hans,* and *thulsi*. Shambu is a combination of lime and tobacco where as pan parag contains areca nut in addition to lime and tobacco. Khaini has become equally, if not more, popular when compared to the commonly available tobacco products such as cigarettes and bidis. Worse still, it seems to have already caught the imagination of the youth. Being a new variety, many people are convinced that it is a harmless one similar to the areca nut because the new stuff is packed in a similar way as that of the areca nut packets. More over, it is relatively cheaper than the cigarettes and the bidis. Preliminary interview, prior to undertaking the present study, with some of the khaini users revealed that they found it difficult to stop the habit after a few months of use. As a corollary, it can be then said that many continue to use the stuff against their better inclinations.

1.7. Comprehensive Tobacco Control Programmes

The increased prevalence of tobacco use and the ever-increasing threat of its health hazards necessitate some programme for the control of further spread of tobacco epidemic. Many countries over the last 40 years started programmes on health promotion and health education against health hazards of tobacco. But these were undermined by the market strategies of tobacco industry. Again tobacco use is a

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♠ Immediately after the survey, government banned khaini products but it is still widely available. (There are newspaper reports also)

socially acceptable practice in many countries. As a result, the programmes on health promotion and health education failed in all those countries and resulted in a well-informed population of continuing smokers. These experiences proved that these programmes alone are not sufficient to decrease the tobacco consumption. Due to this reason, many countries attempted *Comprehensive Tobacco Control Programme* that include

- Ban on tobacco advertisements
- Statutory warning on tobacco products
- Restriction of use in places where people gather
- High taxes on tobacco products
- Health education and health promotion programmes
- Smoking cessation programmes

Australia, Finland, France, Iceland, New Zealand, Norway, Portugal, Singapore, Sweden, and Thailand have already implemented the *Comprehensive Tobacco Control Programme* and succeeded in either reducing the prevalence or keeping the prevalence at a low level[37]. In 1995 the international organizations and individuals met at the Rockefeller Foundation's study and conference center in Bellagio, Italy declared that tobacco consumption is a major threat to sustainable and equitable development[38]. They also added that tobacco consumption is a hindrance to social & economic developments and environmental pollution in addition to health hazards.

Now the tobacco companies are targeting to women and children. It is the high time to save them, before the tobacco industry seize the vulnerable. Proper monitoring of prevalence of tobacco consumption, consequent health sufferings and the economic effects at regional, state and national levels is highly essential. On the other hand, China and India together contribute 44.6 per cent to the world tobacco and any control or

restriction on either tobacco production or consumption will lead to an income loss to the individuals engaged in the production as well as to the nation producing it. However, we have already seen that the economic loss owing to the stoppage of tobacco production would be minimal at the national level especially in major countries like India and China. Yet, there could be losses to the individuals involved in the production and so, any policy change should address this problem too at the micro level.

1.7.1. The Role of WHO

The WHO reaffirms its commitment for tobacco control by adopting 14 resolutions, during 1970 to 1995, in the World Health Assembly, the governing body of WHO[19]. The resolution numbered WHA 39.14 (1986) demands all the member states to formulate a comprehensive tobacco control strategy with some minimum of 9 elements like

- Effective protection of non smokers in public places and work places
- Education of people about the health hazards of tobacco
- Promotion of quitting of tobacco use
- Prevention of direct and indirect advertisements

There are other organizations such as the International Union Against Cancer (UICC) and International Union Against Tuberculosis and Lung Disease (IUATLD) working against tobacco use.

1.8. Consumption of tobacco products: an overview

Use of smoking tobacco is seen all over the world; yet, chewing is more common in Southeast Asia and there are more than 100 million chewers in India and Pakistan alone. Snuff dipping is seen in South America, United Kingdom and Sweden it is more prevalent in Africa. Use of smoking tobacco is generally higher when compared to the use of smokeless tobacco products all over the world and this holds good for

Kerala as well[40]. However, things are changing in Kerala now and smokeless tobacco products like the *khaini* are freely available. Therefore, one can foresee a change in the pattern of tobacco use in Kerala in favor of smokeless tobacco products. Even in the case of smokeless tobacco, there appears to be a shift away from the traditional habits such as chewing of *pan* and snuff and *khaini* attracts more people now, especially the youth. One advantage with the khaini is that it seems to have the approval of the community so that it can be openly consumed unlike other tobacco products, which are stigmatized.

1.8.1. Socioeconomic variations

Tobacco habit widely varies with age, sex and socioeconomic status. Men start using initially and women start later by 10 to 30 years. The prevalence of tobacco habit among men is higher when compared to women. The classical pattern of tobacco use suggests that the habits of smoking starts at an early age of around 15 years among men and then slowly more and more people join this cohort to push the prevalence up. In developed countries, women also start at an early age where as in countries like India, women are expected to start late and the prevalence among women is much less. The usual experience is a decrease in prevalence with the increase in the level of education and household income.

There has been an increase in the use of manufactured cigarettes in the world over a 25-year period starting from 1967 and the quantity of use increased from 2.8 trillion cigarettes to 5.7 trillion cigarettes. The per capita cigarette consumption during the same period increased by 25percent[41]. During the 20-year period ending in 1985, there was a sharp increase in production and sale of smokeless tobacco products in developed countries. In all, about 1100 million people (900 million males and 200

million females) in the world now smoke and of these, 800 million live in the developing world(Table1.8).

Table.1.8. The prevalence of tobacco use (in millions) in the world by sex.

Countries	Males		Females		Total in million
	million	%	million	%	
Developed Countries	200	42	100	24	300
Developing Countries	700	48	100	7	800
World	900	47	200	12	1100

Source: WHO (1997) **Tobacco or health: A global status report**, Geneva, page 12

Sixty five per cent of males and 33 per cent of the females in India use some form of tobacco according to WHO estimates. Thirty five per cent among the males smoke where as 22 per cent of them use smokeless tobacco products while 8 per cent use both the forms of tobacco. Among females, only 3 per cent smoke but the use of smokeless form is more or less similar to that of the male counterpart. The annual per capita cigarette consumption in the country has increased from 1010 cigarettes in 1970-72 to 1370 cigarettes in 1990-92 while the trend in many developed countries is just opposite. The per capita consumption of cigarettes has come down in 18 out of 30 developed countries in the world. This is a cause for concern in India.

2. METHODOLOGY

As mentioned in the previous chapter, the main aim of this study was to document the magnitude of tobacco consumption in a rural community in Kerala. This being the major objective, primary data collection formed the essential component of the methodology. Accordingly, a random survey was conducted covering a population of 36000 people belonging to the Balaramapuram rural panchayath (local body) in the Thiruvananthapuram district of Kerala and a questionnaire was used to elicit information from the randomly households in the area. Detailed information was also collected from the individuals who smokes belonging to the chosen households and part of the information collected was descriptive in nature to elicit opinion on some issues related to tobacco use. The questionnaire contained three parts - the first part dealt with the details such as household income, age and sex composition of the household, education, and occupation profile of the individual members of the household; the aim of the second part of the questionnaire was to get details regarding tobacco habit, knowledge about tobacco hazards, and the opinion on sale restrictions, and advertisement; and the third part of the questionnaire was thoroughly devoted to the tobacco users. This questionnaire was pre-tested before the actual survey.

2.1. Description of the study area

The study area is located 12 kilometers south east of Thiruvananthapuram City, the capital of Kerala. Like any other rural panchayath in Kerala, this area is also thickly populated and consequently, a large portion of the available land is being used for housing purpose. As fallout of this, the land available for farming is less and so, people essentially need to look for other occupations for their survival. Weaving is prevalent as a cottage industry in some parts of this area. Balaramapuram town is a business area with a lot of small and medium sized shops. A large number of casual laborers earn their living through the employment in these shops. The panchayat has two high schools and four middle schools. Although there is no college in this area, there are five

private institutions offering training leading to college level degrees especially in arts disciplines (parallel colleges). There is one primary health center, one ayurveda hospital and one homeopathy hospital.

2.2. Study Sample

The area chosen for the study has tweleve panchayat wards covering a population of 36000 and the sample was drawn from all the twelve wards. Four clusters, each containing 10 houses, of houses were identified in each ward from among the house numbers randomly generated by the computer. In total, there were 10,655 houses in the panchayat and the distribution of these houses across diffferent wards is given in table-2.1.

Table-2.1. Distribution of houses among different wards in the Balaramapuram panchayat.

Ward No	1	2	3	4	5	6
No. of houses	1098	934	1176	849	765	1191
Ward No	7	8	9	10	11-12	-
No. of houses	752	687	914	988	1301	-

Ten numbers succeeding the randomly selected number formed a cluster and all the households residing in the houses with the selected random numbers were included in the study. If any of the above selected number didn't represent a household, then the next household was selected. The required data was collected by trained workers under supervision from all the household members residing in the selected houses and were above 15 years of age.

There were six trained workers involved in the study and each one was assigned two wards for this purpose. A total of seven weeks time from 1st January, 1999 was given to them to complete the task and five of the six workers could complete the survey

in only 3 clusters in each of the two wards assigned to them while the sixth worker completed the survey in all the eight clusters assigned to her. In all, 38 clusters were surveyed during the allotted time period of seven weeks yielding a total number of 380 households. However, survey could not be conducted in one house that remained locked during the whole period of seven weeks and so, data were collected from 379 households in the end.

A total of 1,305 individuals living in the chosen 379 households gave an average household size of 3.44 individuals. Out of the 1,305 individuals, three remained absent despite several visits, two could not be interviewed because they were mentally ill and needed psychiatric attention, one person was deaf and dumb, and one more person was unable to speak because of a stroke. Therefore, we could get information from 1298 individuals after excluding these seven persons giving a response rate of 99.5 per cent.

2.3. Training and monitoring of workers involved in the study

All the six workers, who were chosen to conduct the survey, belonged to the local area and were well versed with the local language (Malayalam). They were given detailed training on various aspects of data collection. For the purpose of their convenience and in an attempt to keep the error to a minimum level, the English questionnaire was translated into the local language (Malayalam). To begin with, the researcher briefed the objectives of the study regarding the tobacco use, to the workers and read out all the questions along with the explanation. Doubts were cleared then and there. They were also given an *instruction manual* (please see Annex–2) for the purpose of filling the questionnaire. This was done specifically because the questionnaire contained some specific economic queries. On the second day of the training, 5 people were randomly called from the street and the researcher demonstrated to the workers how the data should be collected using the questionnaire. On the third day, the workers

were asked to collect data individually from some randomly drawn individuals from the same area in the presence of the researcher. Required corrections were made and all the doubts in the mind of the workers were cleared. The process was repeated once again to make the workers feel more comfortable with the data collection job. The actual survey started with this training and the researcher accompanied each worker on his or her first day in the field. Later on, 10 per cent of the survey population was randomly drawn and the researcher himself cross-checked the survey details. In the end, it was found out that the use of new form of the tobacco (*khaini*) was left undetected by the workers. It was noticed that the leftout users were predominantly below 30 years of age. The workers were again trained on this count and they were asked to re-survey the survey population for the purpose of detecting the tobacco habit clearly. The data after this correction has been used for the final analysis.

2.4. Describing a tobacco user

The participants of the study were clearly classified as two groups viz., tobacco users and non users. Tobacco users were further sub-classified as smokers, smokeless tobacco users and users of both the types[39]. A smoker is the one who smoked during the time of the survey and they could be either daily smokers or occasional smokers. An occational smoker is the one who smokes rarely during a week, month, or an year and the occasional smoker group consists of

- **Reducers** - who smoked daily before but now occasionally with an aim of decreasing the quantity ultimately;
- **Continuing occasional group** - who used to be an occasional smoker and still continues to be the same. This group would have smoked more than 100 cigarettes/bidis during his/her life time;

- **Experimenters** - who smoke occasionally and smoked less than 100 cigarettes/bidis during the life time. These are essentially the beginners.

There could have been smokers among those who were described as non-smokers by this study because, by definition, smokers were identified as the ones smoking during the survey period. For this simple reason, a non-smoker category included

- **Ex-smoker** – who smoked previously but is no longer smoking now;
- **Never-smoker** – who never smoked at all previously and is also not a smoker now;
- **Ex-occasional smoker** - is the one who was an occasional smoker previously using less 100 cigarettes/bidis during his/her lifetime but does not smoke now.

The lifetime smoking habit can be that of ever smoking and ever-daily smoking. An ever smoker is the one who ever smoked at least 100 cigarettes but may or may not be a smoker now. An ever-daily smoker is a current daily smoker or reducer or ex-smoker. In other words, the status of smoking can be found as follows:

- **Smokers** - daily smokers + occasional smokers;
- **Ever–Smokers** - daily smokers + occasional smokers + ex-smokers + ex-occasional smokers;
- **Ever daily Smokers** - daily smokers + reducers + ex-smokers;
- **Ex – Smokers** - ex-daily smokers.

The smokeless tobacco users can also be classified in a similar manner.

2.5. Measuring the use of tobacco

At present, there exist two indicators of current exposure of people to tobacco viz., annual per capita consumption of tobacco and prevalence of tobacco use. Annual per capita consumption can be calculated by knowing the quantity of tobacco produced and traded given the size of population[40]. Since many studies have shown that the starting age of tobacco use is normally above 15 years, the denominator is the population size that includes only people of 15 years and above.

$$\text{Annual per capita cigarette consumption per adult} = \frac{\text{Total cigarette consumption}}{\text{Population of 15 years of age \& above}}$$

where,

Cigarette consumption = Cigarette production + Cigarette imports – Cigarettes exports.

The prevalence of tobacco use can be assessed through the population survey. The prevalence of smoking can be estimated if one knows the number of smokers among the population and the size of the population[41]. That is,

$$\text{Prevalence of smoking} = \frac{\text{Number of smokers in the survey population}}{\text{Total size of survey population}} \times 100$$

In the same manner, we can estimate the prevalence of smokeless tobacco use. It is given by

$$\text{Prevalence of smokeless tobacco use} = \frac{\text{Number of smokeless tobacco users}}{\text{Total size of survey population}} \times 100$$

Similarly, the prevalence of different sub-groups concerning several variables can be separately estimated.

$$\text{Prevalence of male smoking} = \frac{\text{Number of male smokers}}{\text{Total size of males in the survey population}} \times 100$$

$$\text{Prevalence of female smoking} = \frac{\text{Number of female smokers}}{\text{Total size of females in the survey population}} \times 100$$

The same thing can be extended to include any number of sub-groups of population. However, this does not reflect the tobacco quitting behaviour of the society. In this context, the prevalence of cessation can be used as a measure of quit rate or quit index.

$$\text{Prevalence of cessation} = \frac{\text{Number of ex-smokers}}{\text{Total size of ever-daily smokers in the survey population}} \times 100$$

The present study used the sample survey and the above formulae to estimate the prevalence of tobacco use and related statistics.

2.6. Assessment of nicotine dependency

Nicotine dependency can be assessed by two methods. According to the first method (Fagerstrom method) [42], the answers of all the six questions as given in the following table about smoking behaviour are collected from all smokers and the behaviours are scored according to the points given in each row of the table. These scores are then added together to get the total score which in turn can be used to classify the smokers into two groups.

The Fagerstrom scale was used to classify smokers into two groups according to the level of nicotine addiction. A score of 6 and above indicates high level of dependency and less than 6 indicate low level of dependency. This classification was used to know the type of treatment required to treat the dependency. Smokers with low level of dependency need only counseling and others need nicotine replacement therapy along with the counseling if one wants to correct the nicotine addiction.

Acccording to another method, previous experience of any of the following withdrawal symptoms during the past quit period (if any) is useful to find the Nicotine dependency. The withdrawal symptoms are craving cigarettes, insomnia, restlessness,

Table-2.2. Fagerstrom scale to assess the nicotine dependency.

Behaviour	Points				Score
	0	1	2	3	
How soon after you wake do you use tobacco?	after 60 min	between 31 to 60 min	between 16 to 30 min	with in 5 min	
How many cigarettes/bidis or packets of other forms of tobacco do you use per day?	10 or less	11to 20	21 to 30	>31	
Do you use tobacco more during the first hour than the rest of the day?	No	Yes	—	—	
Do you find it difficult to refrain from tobacco use in places where it is prohibited (eg. Office, hospitals, bus)?	No	Yes	—	—	
Do you use tobacco even when you are so sick and in bed?	No	Yes	—	—	
Which would you hate most to give up?	All others	the first thing in the morning	—	—	
				Total Score	

depressed mood, irritability, frustration, or anger, anxiety, difficulty in concentrating, increased appetite or weight gain. Experiencing 4 or more symptoms indicates more dependency. However, this method was not used in our study.

2.7. Socioeconomic characteristics of survey population

Socioeconomic status was assessed in terms of level of education, occupation, income and the quality of housing. Number of years of schooling served as the parameter to assess the level of education. For the purpose of this study, various occupations prevalent in this area were broadly classified into five groups, of which only three were earning groups. Income assessment was done after taking into account the inflow from all the possible sources of income in the household. Although care was taken to the larger extent, it was truly difficult to dis-aggregate the indivisible portion of the household income like the one from the household business. Moreover, although some of the individuals were listed as 'housewives', they were productive and were

generating income to the household to some extent. The quality of housing was assessed through a nine dimensional view involving the flooring, roofing and the walls.

As reported earlier, 379 households covering 1,298 individuals were included in the survey and there was no income-less household. Out of the 379 households, 29.6 per cent earned a monthly income of at least Rs.3, 000/- (range Rs. 250 - 15,000) where as 14.5 per cent could not earn even Rs.1, 000/- per month (Table-2.3). Fifty-three households (14 per cent of the sample households) lived in the rented houses where as the remaining resided at their own houses (Table-2.4).

The quality of the houses, where the participants were residing, was also assessed in terms of the type of floor, roof and the wall. Three types in each category were generally

Table-2.3. Monthly income (in rupees) of the chosen households

Income	No. of households
1 - 999	55 (14.5)
1000 - 1999	123 (32.5)
2000 - 2999	89 (23.5)
3000 & above	112 (29.6)
Total	379 (100)

Note: Figures in parentheses are percentages.

Table-2.4. Ownership (number of persons) of house and durable consumer products.

Item	Owned	Not Owned
House	326 (86.0)	53 (14.0)
Two wheeler	14 (3.7)	365 (96.3)
Three wheeler	3 (0.8)	376 (99.8)
Car	4 (1.1)	375 (98.9)
Telephone	4 (1.1)	375 (98.9)

Note: Figures in parentheses are percentages.

observed in the area. Type-1 floor was made of mud, type-2 was made of cement and type-3 was covered with a marble or mosaic. With regard to roof, type-1 indicated thatched roof, type-2 was a tiled one and type-3 had a concrete structure. In the case of wall, type-1 had a muddy wall, type-2 was made up of bricks and type-3 was a plastered one. As it can be observed from table-2.5, 47.0 per cent of the houses had plastered walls, 19 per cent had the concrete roof and 7.7 per cent had marble or mosaic flooring and the rest only had the inferior structures in their own category.

About 55 per cent households didn't own even 5 cents of land while 7.1 per cent owned 25 cents of land. (Table-2.6).

Table-2.5. Quality of houses of study population

Quality	Floor		Roof		Wall	
	Number	%	Number	%	Number	%
Type 1	139	36.7	133	35.1	115	30.3
Type 2	211	55.7	174	45.9	86	22.7
Type 3	29	7.7	72	19.0	178	47.0
Total	379	100	379	100	379	100

Table-2.6. Land ownership

Size of land	Number of households	Percentage
Up to 5 cents	209	55.1
6 - 10 cents	81	21.4
11 - 25 cents	62	16.4
More than 25 cents	27	7.1
Total	379	100

Table-2.7 brings out the age and sex composition of the individuals covered by the survey. As the table reveals, 45.2 per cent of the people belonged to the age group of 25-44 years while 7.5 per cent were above 64 years of age and the males constituted 48.5 per cent of the sample. Nearly 91 per cent of the individuals surveyed were literate

Table-2.7. Age and sex composition of the study population.

Age group	Percentage		
	Male	Female	Total
15 - 24	9.0	15.0	24.0
25 - 44	23.3	22.0	45.2
45 - 64	12.0	11.2	23.3
Above 64	4.2	3.3	7.5
Total	48.5	51.5	100
N	626	672	1298

Table-2.8. Level of education of the individuals.

Number of years of schooling	Number of individuals	Percentage
0	118	9.1
1 -5	279	21.5
6 -10	641	49.4
11 - 15	235	18.1
Above 15	25	1.9
Total	1298	100

Table-2.9. Occupation profile of the study sample.

Occupation	Number	percentage
Laborers	334	25.7
Self-employed	165	12.7
Salaried	114	8.8
House wives	357	27.5
Unemployed	328	25.3
Total	1298	100

and 1.9 per cent were minimum graduates (Table-2.8) while about 70 per cent had at least primary education. The occupation profile of the individuals (Table-2.9) indicates that 52.8 per cent of the sample didn't engage in any gainful employment although the

unemployment rate among the study subjects was 25.3 per cent. The unemployed category includes the dependents (students and old age people) too and if we exclude the dependents from the list of unemployed, then the real unemployment rate was only 9 per cent. It means that only 9 per cent of those who desire to have an employment remained unemployed. In other words, the others, who were not gainfully employed, were either voluntary unemployed or dependent. Among the employed, the predominant (25.7 per cent) occupation was the wage labor. Table-2.10 gives the details of the personal income of the sample population. While 51 per cent earned nothing, 13.8 per cent of the individuals earned an income above Rs.2, 000/- per month.

Table-2.10. Personal monthly income of the individuals.

Income	Number	Percentage
0	662	51.0
1 - 999	200	15.4
1000 - 1999	257	19.8
2000 & above	179	13.8

2.8. Analysis of data

The analysis of the data was done using a computer (SPSS PC + and Epi 5). Statistical methods like the Chi-Square test and multiple regresssion were used for the purpose of the analysis. Both the entry of data and the analysis were done by the investigator himself. The main dependent variable in the case of regression was the expenditure on tobacco consumption and the independent variables include sex, age of the user, years of schooling and personal income. The analysis was done separately for all the occupation groups. The occupation groups for this purpose included labour, salaried, self employed, unemployed and the housewives. The t-test was used to find out the significance of the estimated parameters.

2.9. Ethical considerations

First of all, the objectives of the study were clearly explained to all the participants by the researcher as well as by his team and so, the participants were fully aware of the study and its objectives before giving consent to participate in the study. As an incentive to those who participated in the study, the researcher, a qualified medical practitioner, offered free medical check up and anti-tobacco advice to all the participants of the study during the survey period. In addition, the workers too gave anti-tobacco advice to the individuals participating in the survey during the re-survey period.

2.10. Limitations of the study

1. The quantities of raw tobacco used for pan chewing varied widely among individuals and from time to time even for the same individual. This is the case with khaini and snuff use too. The quantity of tobacco present in khaini and snuff is also not known. In the case of smoking, many different brands of cigarette and bidi are available. Therefore it is not possible to compare the tobacco equivalents for these different products.
2. There is no standard scoring scale to assess the nicotine dependency among the users of smokeless tobacco, similar to Fagerstrom scale for smokers. Hence the nicotine dependency could not be assessed for smokeless tobacco users.

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3. RESULTS

3.1. Tobacco habit of the survey population

This survey, conducted in January 1999 and involving 1,298 people (631 men and 667 women) of minimum 15 years of age, was used to estimate the prevalence of tobacco use in a rural panchayath (local body) of Kerala. The prevalence was estimated separately for smoking and smokeless tobacco products; the smokeless tobacco products commonly used in this area are *pan*, *khaini* and *snuff*. Separate prevalence rates were also arrived at for men and women, different occupation groups, different years of schooling (0, 1-5, 6-10, 11-15 and above 15), and for different age groups (15-24, 25-44, 45-64 and 65 &above). The occupation groups considered for this purpose were laborers, self employed, salaried class, housewives and unemployed; self-employed group includes farmers, business people, technicians and professionals. Students, elderly and unsuccessful job seekers were included in the unemployed group.

In all, 36.9 per cent of the survey population was found to be using some form or the other of tobacco products with varied frequency such as daily, occasionally or rarely (Table-3.1). The prevalence among men was 70.8 per cent where as among women, it

Table-3.1. Per cent of men and women with various tobacco habits.

Type of Tobacco habit	Men	Women	Total
Smoking	53.3	0.1	26.0
Smokeless	17.5	4.8	10.9
Any form	70.8	4.9	36.9
Non users	29.2	95.1	63.1
Total number of persons	631	667	1298

was 4.9 per cent. The major behavioral difference between men and women was that men predominantly used the smoking form of tobacco where as women used more of smokeless tobacco. However, men outnumber women in both the forms of tobacco use.

Overall, 26.0 per cent of the people used smoking form and 10.9 per cent of them used the smokeless one. In addition to this, there are new comers (experimenters) too and the proportion of experimenters (5.4 per cent of the population) was high in the case of *khaini* and was low (0.1 per cent) in the case of *snuff* (Table-3.2). Both are smokeless forms of tobacco and the use of *Khaini* in general was more common than that of the other two forms of smokeless tobacco products put together.

Table-3.2. Distribution of survey population (per cent) by tobacco use user status.

User status	Smoking	Chewing	Khaini	Snuff
Never users	72.4	92.6	84.4	98.1
Experimenters	1.6	1.1	5.4	0.1
Daily users	26.0	6.3	10.2	1.8
Total (n = 1298)	100	100	100	100

Note: **Never user** is the one who has never used tobacco before
Daily user is the one who has used at least 100 cigarettes/bidis or chewed pan at least 100 times or used at least 100 grams of Khaini or dipped snuff at least 100 times.
Experimenter is the one who can't be included in daily user group but has used at least once.

3.1.1. Tobacco habit by age and sex

The use of tobacco seems to be stabilizing beyond the age of 25 years because the prevalence of tobacco use was uniformly above 40 per cent for the age groups beyond 25 years (Table-3.3). The prevalence of smoking was the highest among 25-44 age group (33.6 per cent) and lowest among 15-24 (8 per cent). Khaini use was more prevalent among the age roups of 15-24 and 25-44 years where as snuff use was at a peak beyond the age of 64 years.

Table.3.3. Age specific prevalence (per cent) of tobacco consumption by product type.

Age group	Tobacco use		Smoking		Pan chewing		Khaini use		Snuff use	
	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters
15 to 24 (312)	19.2	1.9	8.0	1.9	0.3	0.3	14.4	2.6	0	0
25 to 44(587)	43.9	1.4	33.6	1.7	3.9	1.0	14.5	10.1	1.2	0
45 to 64(302)	40.4	2.3	29.8	1.6	12.3	1.7	0.7	0.7	3.3	0.3
> 64 (97)	40.2	2.1	25.8	0	21.6	2.1	0	1	6.2	0
Total (1298)	36.9	1.8	26.0	1.6	6.3	1.1	10.2	5.4	1.8	0.1

Note : 1. The figure in parenthesis is the total number of individuals in that age group.
2. For each product type and age group, the never users category (not shown in the table) is the third category in addition to 'daily users' and 'experimenters'. The three per cents will add up to 100.

The use of snuff was found to be widely prevalent among the elderly people like in the case of pan chewing. The prevalence was the highest (6.2 per cent) among the oldest group of people (above 64 years) and lowest among the youngest (15-24 years). What is more important is that not many are experimenting with the snuff.

Table.3.4. Sex wise prevalence (per cent) of tobacco consumption by product type.

Sex	Tobacco use		Smoking		Pan chewing		Khaini use		Snuff use	
	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters
Men (631)	70.9	2.2	53.3	1	8.3	1	20.8	11.1	3.7	0.2
Women (667)	4.8	1.3	0.1	1.2	4.5	1.2	0.1	0	0	0
Total (1298)	36.9	1.8	26.0	1.1	6.3	1.1	10.2	5.4	1.8	0.1

Note : 1. The figure in parenthesis is the total number of individuals in that age group.
2. For each product type and age group, the never users category (not shown in the table) is the third category in addition to 'daily users' and 'experimenters'. The three per cents will add up to 100.

There is a clear difference in the prevalence of tobacco use between men and women (Table-3.4). However, the difference has narrowed down in the case of pan chewing. About three fourth of men use some form of tobacco and this is 12 times more than that of the prevalence among women. There was no snuff dipper among women but there was a smoker and a khaini user among the surveyed women. Snuff-dipping habit

was not very high among men when compared to smoking or any other form of tobacco use. The difference between men and women narrowed down in the case of experimenters of all types of tobacco products barring the khaini and snuff.

3.1.2. Tobacco habit by level of education

The level of education of the people was assessed on the basis of number of years of schooling. Table-3.5 demonstrates the prevalence of tobacco habit according to the education level of the people. The results indicate a mixed trend although the tobacco use was much less when the education level was beyond 10 years of schooling.

Table.3.5. Education wise prevalence (per cent) of tobacco consumption by product type.

Educational level	Tobacco use		Smoking		Pan chewing		Khaini use		Snuff use	
	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters
0 (118)	34.7	1.7	25.4	0	20.3	1.7	20.3	1.7	1.7	0
1-5 (279)	46.6	1.4	34.1	0.7	11.5	1.8	11.5	1.8	2.2	0
6-10 (641)	38.5	1.9	27.8	1.9	3.7	1.1	3.7	1.1	2.0	0.2
11 - 15 (235)	24.3	1.7	13.6	2.6	0.9	0	0.9	0	0.9	0
> 15 (25)	16.0	4.0	8.0	4.0	0	0	0	0	0	0
Total (1298)	36.9	1.8	26.0	1.6	6.3	1.1	6.3	1.1	1.8	0.1

Note : 1. The figure in parenthesis is the total number of individuals in that age group.
2. For each product type and age group, the never users category (not shown in the table) is the third category in addition to 'daily users' and 'experimenters'. The three per cents will add up to 100.

Twenty per cent of the highly educated group (beyond 15 years of schooling) used tobacco whereas 36.4 per cent of the illiterates used tobacco in some form or the other. The use of tobacco was very high (48 per cent) among those who had primary education. The experimenters of smoking were highest among the most literate.

3.1.3. Occupation and tobacco habit

The occupation wise classification of the tobacco habit was also obtained for the survey population. Although information on the exact occupation of the individuals was

collected, the occupations were grouped into five broad categories based on the nature of the concerned occupation. Of the five, two (housewives and unemployed) were

Table.3.6. Occupation wise prevalence (per cent) of tobacco consumption by product type.

Occupation	Tobacco use		Smoking		Chewing		Khaini use		Snuff use	
	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters	Daily users	Experimenters
Laborers(334)	76.6	0.9	58.4	2.4	11.4	1.5	19.5	13.8	3.0	0
Self Employed (165)	67.3	3.6	53.3	3.6	6.1	1.2	24.8	10.3	4.2	0.6
Salaried (114)	27.2	3.5	23.7	2.6	2.6	0	0	1.8	3.5	0
House wives (357)	5.3	1.4	0.3	0	4.5	1.4	0.3	0.3	0	0
Unemployed (328)	18.9	1.5	7.9	0.9	4.6	0.6	7.6	1.2	4.6	0
Total (1298)	36.9	1.8	26.0	1.5	6.3	1.1	10.2	5.4	1.8	0.1

Note :1.Unemployed includes students, elderly people not capable of doing any work and real unemployed. The real unemployed is those who are trying to get a job and not getting it.
Note : 2. The figure in parenthesis is the total number of individuals in that age group.
3. For each product type and age group, the never users category (not shown in the table) is the third category in addition to 'daily users' and 'experimenters'. The 3 per cents add up to 100.

unproductive groups in an economic sense. The three productive groups were casual labor earning daily wage, salaried earning regular monthly wage and the self employed engaged in their own business or other activities. Table-3.6 reports the results concerning to this aspect. As it can be seen from the table, 77.5 per cent of the casual laborers used tobacco in some form while the proportion was 70.9 per cent for the self employed. Over 30 per cent of the salaried group were tobacco users and only 6.7 per cent of the housewives had the tobacco habit. A similar pattern with a little variation was found in the use of specific forms of tobacco.

3.2. Tobacco use pattern

Among the smokers, 8 per cent smoked at least 30 cigarettes a day while another 9.5 per cent smoked between 20 and 30 cigarettes (Table-3.7). Only 4.5 per cent smoked occasionally and not on a daily basis. Regarding khaini, 19.4 per cent of the users used at least 15 grams of it daily (Table-3.8). Therefore, among the tobacco products, the intensity of use seems to be very high for khaini. This indicates hgih addiction level with regard to khaini because those who used it appeared to be using it very frequently.

Table.3.7. Distribution of ever daily smokers by quantity of smoking.

Quantity of cigarettes or bidis / day.	Number	%
0	15	4.5
0 - 10	196	58.3
10 -20	66	19.6
20 - 30	32	9.5
> 30	27	8.0
Total	336	100

Table-3.8. Distribution of khaini use by quantity of use.

Quantity of khaini use in grams per day	Number	%
0 - 5	3	2.2
5 - 10	63	47.0
10 - 15	42	31.3
> 15	26	19.4
Total	134	100

One of the major causes of addiction to smoking is the nicotine dependency and this may be assessed by Fagerstrom scale. Table-3.9 shows that nearly half of smokers started smoking within 5 minutes after waking up from the bed in the morning and only one third of smokers could postpone it for about an hour or more. Also, 86.3 per cent of smokers smoked more number of cigarettes/bidi in later hours after the first hour. The

fraction of people who wished to stop smoking, or tried to stop smoking, or abstained from smoking at least when hospitalized are also given in the table. Since only a minor portion of the survey population had the history of hospitalization, others were asked to simulate the behaviour if they were to be hospitalized. This was done in an attempt to determine the possible or actual smoking behaviour during the illness. Although about three-fourth had the desire to stop smoking, and more than three-fifth wished to temporarily stop smoking while ill, only about 50 per cent tried to stop smoking.

Table-3.9. Distribution of selected smoking practices among the surveyed smokers.

Time intervel between start smoking and waking up in the morning (n = 321)		**%**
Time interval	< 5 min	45.5
	6 to 30 min	18.1
	31 to 60 min	3.7
	> 60 min	32.7
	Total	100.0
*** Smokers who do so more frequently in the first 1 hour after waking up (n = 321)**		13.7
Smokers who stop smoking when hospitalized (n = 336)		84.2
People who can't give up smoking even if they give up any other habit. (n = 336)		15.2
People who has desire to stop smoking (n = 336)		73.8
***People who tried to stop smoking (n = 321)**		54.5

Note: *Even though there are 336 smokers, 15 are not smoking now and hence these questions were not asked to them.

Fifteen persons stopped smoking and the duration of the pause varied between 3 months and 45 years. Three of them stopped just a year ago while another 10 stopped less than 5 years ago and four persons could sustain it for more than 5 years. Out of the four, one stopped the habit 11 years back where as the other one stopped 45 years back. The prevalence of ex-smokers was 1.16 per cent in our study population and the prevalence of cessation of smoking was 3.13 per cent.

3.2.1. Reasons for discontinuing tobacco use

The reasons for discontinuing the smoking habit alone were considered here and Table-3.10 reports the results in this regard. A majority of those quit smoking did it due to the harmful effects of smoking or for fear of getting tobacco-related diseases. Only 4.4 per cent had economic reasons (resource constraint) for discontinuing. About 21 per cent of the smokers who have no desire to stop, continue to smoke out of ignorance that tobacco does not cause any illness and another 36.4 per cent could not leave due to habit persistence.

Table-3.10. Primary reason for discontinuing or continuing smoking.

Reasons	Desire to quit or already stopped		No desire to quit	
	Number	%	Number	%
Aware of Hazards	121	48.8	0	0
Tobacco use causes illness	72	29.0	0	0
Resource constraints	11	4.4	0	0
Advises or abuses	29	11.7	0	0
Temptation and Habituation	15	6.0	32	36.4
Tobacco use doesn't cause any illness	0	0	18	20.5
Unaware of hazards	0	0	10	11.4
Causing illness if not used	0	0	14	15.9
Thinks it is good for health	0	0	14	15.9
Total	248	100	88	100

3.2.2. Nicotine Dependency Score

The Fagerstrom scale is useful to classify smokers into two groups with respect to the level of nicotine addiction. A score of 6 and above indicates high level of dependency and less than 6 indicate low level of dependency. This classification was used to know the type of treatment required to treat the dependency. Smokers with low level of dependency need counseling only and others need nicotine replacement therapy and counseling for treating nicotine addiction. Among the smokers of the survey

population, more than four-fifth of smokers had a nicotine dependency score of less than 6 (Table-3.11).

Table-3.11. Nicotine Dependency Score

Nicotine Dependency Score	% of people
less than 6	84.2
6 and above	15.8
Total	100 (321)

3.2.3. Expenditure on Tobacco use

The expenditure on tobacco use also varied widely from individual to individual. Though more than 50 per cent of smokers were spending only less than Rs.4 per day, 13.4 per cent were spending more than Rs.12 per day (Table-3.12). There were 16 persons among the smokers who did not spend anything towards smoking. Out of these 16, 15 were ex-smokers and one was a rare smoker who smoked only when he got it free of cost. More than 90 per cent of khaini users spent only less than Rs.4 per day and nobody spent more than Rs.8 per day at any point of time. Out of total expenditure devoted for tobacco consumption, about three-fourth was spent on smoking while the amount spent on snuff was negligible. Table-3.13 gives the expenditure on each tobacco product as share of the total tobacco expenditure.

Table-3.12. Percent distribution of expenditure by tobacco product type.

Expenditure per day (in rupees)	Smoking	chewing	Khaini use	Snuff use
0	4.8	4.9	0	12.5
< 4	46.1	72.0	92.5	83.3
>4 - 8	26.5	18.3	7.5	4.2
>8 - 12	9.2	3.7	0	0
> 12	13.4	1.2	0	0
Total	100 (336)	100(82)	100 (134)	100 (24)

Table-3.13. Expenditure on various tobacco products as per cent of total expenditure.

Tobacco Habit	Expenditure (Rs)	
	Amount (Rs)	% of Total
Smoking	2122.3	73.7
Chewing	289.0	10.0
Khaini use	424.5	14.7
Snuff use	43.8	1.5
Total	2879.6	100

3.3. Multivariate analysis of factors associated with expenditure on tobacco

A simple linear regression was considered in the first place to know the influence of various factors on the tobacco consumption. Since the measurement unit of the quantity is not uniform for all the forms of tobacco, quantity could not be the dependent variable for the regression here. A possible substitute then could be the expenditure on tobacco consumption because the study pertains to a single point of time and therefore, the time series variation in price, money value and others did not constrain the use of expenditure as a dependent variable. The independent variables considered were age, sex (dummy), level of education (expressed in terms of number of years of schooling), and the personal income. All these variables fitted against the personal expenditure on tobacco. The exercise was repeated separately for each occupation group and for the categories of smoking and smokeless tobacco use. Since duration was found to be positively correlated with age ($p < 0.01$), it could not be included as an independent variable because age acted as a proxy for duration. Tables from 3.14 to 3.18 report the results for various categories.

As it can be seen from Table-3.14, age was not an important determinant of tobacco consumption while the other three variables such as education, income and sex significantly influenced ($p < 0.01$) it. Every additional year of schooling significantly reduces the monthly tobacco consumption where as 0.1 per cent of any additional income generated appears to have been spent on tobacco. Also, men were spending more on tobacco. This is with respect to tobacco consumption of any form. With respect to smoking, the whole regression was statistically insignificant suggesting that the variables concerned did not have any influence whatsoever on smoking (Table-3.15). In the case of smokeless tobacco use, income had a negative role to play ($p < 0.05$) while the other variables were rendered insignificant (Table-3.16). Any additional one-rupee income reduces the smokeless tobacco consumption by 0.04 per cent.

Table-3.14. Regression results - all tobacco users.

Dependent Variable : Monthly expenditure on tobacco consumption (in rupees)
$\mathbf{R^2}$: 0.065 **N** = 495

Variables	β	**SE β**	**P value**
Age	-0.026	0.020	0.199
Education	-0.288	0.079	0.000
Income	0.001	0.0003	0.000
Sex	2.568	1.552	0.018

Table-3.15. Regression results - smokers* (daily and experimenting).

Dependent Variable : Monthly expenditure on smoking (in rupees)
$\mathbf{R^2}$: 0.016 **N** = 352

Variables	β	**SE β**	**P value**
Age	-.127	.077	0.102
Education	.173	.296	0.560
Income	-.002	.001	0.207

* *Sex was excluded because there was only one female smoker.*

Table-3.16. Regression results - smokeless tobacco users.

Dependent variable : Monthly expenditure (in rupees) on smokeless tobacco use
R^2 : *0.028* N = 296

Variables	β	SE β	P value
Age	.019	.010	0.072
Education	.025	.039	0.052
Income	-0.0004	0.0001	0.023
Sex	.320	.465	0.492

Since only men were involved in smoking with the exception of a single woman, the regression by sex was obtained only for smokeless tobacco use. Age was a positive contributor to the smokeless tobacco consumption in the case of men where as income contributed negatively (Table-3.17). Education was not a significant determinant of tobacco consumption in the case of men. For women, education was the only variable significant ($p < 0.05$) and the result suggest that any increase in education led to a decrease in smokeless tobacco consumption.

Table-3.17. Regression results (men) - smokeless tobacco users

Dependent variable : Monthly expenditure (in rupees) on smokeless tobacco use
R^2 : 0.036 N = 258

Variables	β	SE β	P value
Age	.023	.011	0.034
Education	.066	.041	0.108
Income	-0.0004	0.0001	0.016

Table- 3.17a. Regression results (women) - smokeless tobacco use

Dependent variable : Monthly expenditure (in rupees) on smokeless tobacco use
R^2 : 0.130 N = 38

Variables	β	SE β	P value
Age	.011	.040	0.772
Education	-.282	.137	0.048
Income	-0.0007	.002	0.731

Regression results were also obtained for different occupation groups and the results are reported in Table-3.18. No variable was significantly influencing tobacco consumption in the case of labour group and no direction could be established with respect to tobacco consumption for this group (Table-3.18). Education and income were significant in the case of the self-employed group (Table-3.18a). While education was negatively associated, income was positively associated with the expenditure on tobacco consumption. Tobacco consumption went up by 0.3 paise for every additional personal income of Re.1/-. This is three times when compared to the results of all tobacco users. No variable was significant in the case of salaried group, housewives and unemployed.

Table-3.18. Regression results by occupation (labourers) - all tobacco users.

Dependent Variable: Monthly expenditure (in rupees) on tobacco consumption
R^2: 0.027 N = 254

Variables	β	SE β	P value
Age	.009	.032	0.770
Education	-.144	.110	0.193
Income	.001	0.0006	0.107
Sex	2.504	2083	0.230

Table-3.18a. Regression results by occupation (self employed) - all tobacco users.

Dependent Variable : Monthly expenditure (in rupees) on tobacco consumption
R^2 : 0.099 N = 111

Variables	β	SE β	P value
Age	-.024	.057	0.668
Education	-.657	.247	0.009
Income	.003	0.0009	0.008
sex	4.452	5.152	0.389

Table-3.18b. Regression results by occupation (salaried) - all tobacco users*.

Dependent Variable : Monthly expenditure (in rupees) on tobacco consumption
R^2 : 0.122 N = 32

Variables	β	SE β	P value
Age	-.044	.087	0.614
Education	-.643	.354	0.079
Income	-0.0008	.001	0.476

** No women from the salaried class used tobacco in any form.*

Table-3.18c. Regression results by occupation (housewives) - all tobacco users*.

Dependent Variable : Monthly expenditure (in rupees) on tobacco consumption

R^2 : 0.232 N = 21

Variables	β	SE β	Significant P value
Age	.083	.057	0.160
Education	-.221	.176	0.223

* *Since housewives is a unisexual group, sex was not included and since they do not generate income in a direct sense, income was also excluded.*

Table-3.18d. Regression results by occupation (unemployed) - all tobacco users*.

Dependent Variable : Monthly expenditure (in rupees) on tobacco consumption

R^2 : 0.027 N = 63

Variables	β	SE β	P value
Age	-.025	.027	0.342
Education	-.127	.120	0.297
Sex	.646	1.132	0.571

* *Since it is unemployed group, income is absent from the regression.*

3.4. Awareness and attitude towards the ill effects of tobacco use

This study also covered the issue of attitude and awareness with regard to the ill-effects of tobacco consumption. The general impression was that a vast majority of the people agreed to the fact that tobacco products are injurious to health. However, when it comes to

Table-3.19. Awareness (per cent) regarding the health hazards of tobacco use among various type of tobacco users.

Disease	Smoking	Pan chewing	Khaini	Snuff
Heart disease	10.2	0.2	0.3	0.6
Hypertension	2.4	0.2	0.1	0.2
Asthma	32.1	1	0.3	1
Lung cancer	46.0	5.3	2.2	0.3
Mouth cancer	8.4	38.4	16.3	2.4
Deleterious effects of Passive smoking	11.6	0.5	0.4	0.3

specific illness caused by tobacco consumption, more than half of have only less knowledge (Table-3.19). A fair proportion of the respondents was aware of the association between smoking and the diseases like lung cancer and asthma. Regarding the smokeless tobacco use,

the awareness of the people was high in the case of the association between the pan chewing and the mouth cancer.

The study also tried to capture the difference in the awareness level of both users and non-users and the results are given Table-3.20. The results would suggest that there was no significant difference in the awareness level of these two groups of people. The chi square test to find the association between two groups also confirmed this impression. However, the awareness that the use of khaini causes mouth cancer was significantly ($p < 0.01$) high among the users.

3.4.1. Opinion about banning of tobacco products

Majority of people agreed that tobacco products need to be banned. However, it seems that they were unsure or unaware of the impact of the ban on tobacco use. More than 80 per cent supported the specific ban not to allow the children to buy them, a ban on advertisements of tobacco products and prohibition of the use in public places (Tbale-3.21). Over three-fourths called for a total ban and only 7 per cent agreed that the statutory warning would have any

Table-3.20. Awareness (per cent) regarding health hazards of tobacco use among users and non users of tobacco.

Diseases	Users	Non users	p value
Smoking			
Heart disease	10.4	10.1	0.94
Hypertension	3.9	1.9	0.047
Asthma	35.6	31.0	0.94
Lung cancer	48.4	45.7	0.36
Mouth cancer	8.6	8.3	0.95
Deleterious effects of Passive smoking	10.7	15.4	0.39
Chewing paan			
Mouth cancer	36.6	38.6	0.5
Khaini			
Mouth cancer	28.8	14.8	0.000

impact on the tobacco use. Except the ban on advertisement, there was no significant ($p < 0.01$) difference in opinion between the users and nonusers.

Table-3.21. Opinion (per cent) on the ban of tobacco products.

	Users	Non users	p value
Ban the sale	71.8	75.9	0.11
Ban the sale to children	78.5	83.5	0.03
Ban the advertisement	77.9	85.2	0.001
Ban the use in public places	77.7	81.4	0.12
Reduce the tobacco content	11.1	10.4	0.77
Impose statutory warning on the packets	6.9	7.1	0.98

General opinion of the people were also sought at the end of the survey on different aspects of tobacco use and the opinions expressed by the people can be summarised as under :

Remark-1. "Majority of youth between 15 to 25 years use khaini products. Please ban it otherwise it will ruin the new generation". This group thought khaini is more hazardous than other tobacco products;

Remark-2. "Completely ban all disease causing agents like Cigarettes, bidis, khaini....";

Remark-3. "Even if these products are banned it will be available for use";

Remark-4. "Smokers can escape only if the cigarettes and bidis are completely banned. Otherwise the persons stopped smoking will get inspiration to smoke again by seeing others smoking and by getting the smell of smoke";

Remark-5. "Ban the sale of tobacco products near the schools".

The support of the people for the above remarks are given in Table-3.22. There was significant support among the people for remark-1 and remark-4 also received fair amount of support. These were open and unconstrained remarks and so can be taken as

referendum of the people. Some people expressed joint opinions and so the results are not additive. Remark-1 was very significant in the light of the results obtained by this study that the khaini use is gaining popularity among the youth and thus showing an upward trend.

Table-3.22. Distribution of opinion of people about tobacco use.

Remarks	Number	%
Remark 1	814	62.6
Remark 2	217	16.7
Remark 3	13	0.01
Remark 4	513	39.4
Remark 5	19	0.01
No Remark	155	11.9

4. DISCUSSION AND CONCLUSIONS

The main objective of this study was to document the magnitude of tobacco use, as has been mentioned earlier. A range of tobacco products available for use in the chosen study area was also identified in that process. The study was conducted in a rural local body (panchayat) in Kerala (India) covering about a population of 36,000. A random sample survey was conducted in the above area for this purpose during the months of January and February 1999. The survey covered 379 households and 1,298 individuals.

4.1. About the prevalence

The results indicated that 36.9 per cent of the individuals covered by this study used some form of tobacco. Tobacco use was widely prevalent among men and 70.8 per cent of the surveyed men used tobacco whereas only 4.9 per cent of the women counterpart used tobacco. Results obtained from earlier studies on tobacco use in Kerala indicate a range of prevalence rates (44.6 - 65.0 per cent for men and 16.4 - 33.0 per cent for women) of tobacco use in rural Kerala[5,6,9,10]. Our results do not fall within this reported range of prevalence in the case of men. In the case of women, the figures obtained by the present study falls very short of the reported range of 13.4 - 33.0 per cent in the past. From this, one may observe that the present study yields estimates of prevalence that are higher that those observed previously among men and lower that those observed previously among women. Nevertheless, the previously reported range was far too wide and the present results add to them, making it 44.6 - 70.8 per cent for men and 4.9 - 33.0 per cent for women. The KSSP[43] study, which is the most recent one (1987) available for Kerala, reported that the prevalence of tobacco use among rural

males above 15 years in Kerala was 53 per cent. In comparison, the present estimate of 53.3 using the same above 15 years population in a rural area seems tenable.

About 90 per cent of khaini users surveyed by the present study were below 30 years of age and the mean duration of khaini use was 2.6 years. This suggests khaini use is a relatively new phenomenon in the population and is widely prevalent among males of 15-30 years of age. The prevalence of smoking among men obtained by the present study (53.3. per cent) falls well within the range obtained in many other countries in the world (Table- 4.1). In fact, it is closer to the rate obtained in Sri Lanka. The prevalence of smoking among women as estimated by the present study (0.1 per cent) also is closer to that of Sri Lanka. All the other countries reported much higher prevalence rates for women. In fact, Sweden reported a higher prevalence among women than among men. Among men, Sweden reported the least prevalence (22.0 per cent).

Table-4.1. Prevalence of smoking in per cent in selected nations.

Countries	Prevalence		Countries	Prevalence	
	Men	Women		Men	Women
China (1984)	61.0	7.0	U.S.A(1993)	27.7	22.5
Bangladesh (1990)	60.0	15.0	United Kingdom(1994)	28.0	26.0
Sri Lanka (1988)	54.8	0.8	Japan (1994)	59.0	14.8
Pakistan (1980)	27.4	4.4	Sweden (1994)	22.0	24.0

Source: WHO (1997): **Tobacco or health: A global status report.** WHO, Geneva, p 14.

One reason for the larger variation among the results of different studies may very well lie in the definition of tobacco use and the varieties included. If one omits the rare and occasional users of tobacco or if one fails to capture the beginners, then the prevalence could be low. Similarly, if one overlooks the usage of some local forms of tobacco, then there is every chance of under reporting the prevalence. With the arrival of more and more newer forms of tobacco in the scene, there is high chance of missing the newer ones either because the researcher fails to notice their presence or one may

overlook them thinking that they are non-tobacco products. The present study by first documenting the range of products available in the community avoids some of these pitfalls.

4.3. About Factors influencing tobacco habit

The bivariate analysis of tobacco use status with other influencing factors revealed that age, sex, level of education, income and occupation exhibited some degree of association. The prevalence of tobacco use is lowest in the age group of 15 - 24 years and the chi-square test showed that this is significantly different ($p < 0.001$) from the prevalence in the age group of 25 - 44. The fact that the tobacco use stabilizes beyond the age of 25 years (Table-3.3) gives an impression that the age group of 15-24 could be the experimenting age although the data is not sufficient to validate this finding. This could be probably due to the reason that it is often difficult to document the experimenting group and the prevalence of experimenters in this age group might well be an underestimation. This can be partly explained by the fact that the prevalence of tobacco use *per se* is much lower in this age group. the two-fold jump in prevalence in the higher age groups points to the possibility of the persons in this age group being those experimenting.

Tobacco use usually begins below 24 years of age and more people join in this cohort later, to increase the prevalence to the highest by 44 years of age. Then the prevalence may fall due to stoppage of tobacco use by some of them. As the people quitting tobacco use is small, the fall in prevalence after 45 years is not large. The age wise prevalence in the present study can be compared with the study on 29713 people in the state of Goa (India) in 1986-87[44] (Table 4.2). In contrast to the present study, the highest prevalence of tobacco use was between 45- 64 years of age in the Goa study.

Table-4.2. Prevalence of tobacco habits in Goa according to age.

Age	Tobacco habit (%)
15-24	3.2
25-44	28.6
45-64	59.4
>64	48.2

Source: Vaidya GS, Vaidya NS and Naik UD, 1992; 'Epidemiology of tobacco habits in Goa, India'; in **Control of Tobacco related Cancers and other diseases,** (eds.) Prakash CG, JE Hamner III and PR Murti, OUP, Bombay, p 317.

The chi-square test revealed that sex has statistically significant relationship with tobacco habit (p value < 0.001) and the use of smokeless tobacco (p value < 0.001). Predominantly, men smoke. The influence of education on tobacco habit can be compared with the study of 10000 population in Ernakulam district in Kerala, India[30].(Table 4.3). Eventhough the values are different, the trend is similar to the present study. The prevalence of smoking initially increased and then constantly decreased and that of chewing constantly declined with increasing levels of education.

Table.4.3. Distribution of tobacco users according to educational level in Ernakulam in Kerala.

Education	Smoking	Chewing	Mixed	No habit
Illiterate	19	43	11	27
Primary or less	41	23	9	27
Middle school	35	5	3	57
High School	24	1	-	75
College	5	-	-	95

Source: Bhonsle BR; 1992'Tobacco habits in India' in **Control of Tobacco related Cancers and other diseases,** (eds.) Prakash CG, JE Hamner III and PR Murti, OUP, Bombay, p43.

The increase in tobacco habit among the people with 1-5 years of schooling when compared to the illiterates group may be due to increase in income and increase in the knowledge of different tobacco products of various types. The constant decrease of tobacco prevalence with increase in the level of schooling may be due to the awareness of health hazards and access to other forms of pleasure or entertainment as a

consequence of better income. The pan chewing may be a cheaper tobacco option for the illiterates. But, as the educational level increases, pan becomes culturally unacceptable and inconvenient to carry and use. The higher levels of khaini use among 6 –15 years of schooling may be the result of better knowledge about the different khaini products and it may be a convenient alternative to pan. Again, pan is culturally acceptable and considered as a harmless product when compared to smoking. As khaini is a smokeless product with some similarities of pan, khaini could gain popularity easily.

This study results also revealed significant association of occupation with tobacco habit (p value < 0.001), smoking habit (p value < 0.001) and habit of smokeless tobacco use (p value < 0.001). Though there is no significant difference in the tobacco habit between laborers and self employed group (p value = 0.13), there is significant difference between self employed and salaried groups (p value = 0.000). The lack of direct income may be the reason for the low levels of tobacco use among the housewives and unemployed. All housewives were women, which may be an another reason for the low prevalence among them.

4.2. About Behavioural Pattern of Tobacco Use

Smoking appears to have been substituted by *pan chewing* beyond the age of 44 because the latter progressively increases with the age of the population while the former is progressively declining with the age. The prevalence of pan chewing was 21.6 per cent in the above 64 age group where as it was a mere 0.3 per cent among the 15-24 age group. The prevalence of experimentation also shows the similar trend in the case of pan chewing. Khaini use seems to be a recent phenomenon and its use was concentrated among the younger age groups. Even the experimenters predominantly belonged to the lower age group. Khaini use by those aged 45 years of age and more was not noticed.

Over all, the prevalence of khaini use was 10.2 per cent and what is significant is the fact that another 5.4 per cent of the people were experimenting with khaini. In an overall sense, the smoking prevalence tends to decline beyond certain age group and pan and snuff appear to be the spontaneous substitutes of smoking. The use of these two smokeless products starts picking up simultaneously when the smoking starts showing the declining trend. The case of khaini use is alarming, as it has picked up a large chunk of experimenters. Given its trend among various age groups, one can safely predict that the khaini use may soon become the most commonly used tobacco product.

Table-4.2. Onset, duration and frequency of tobacco use.

Age of Onset		
Age of Onset (Age in years)	**Number**	**Per cent**
below 15	20	4.2
15 to 24	277	57.8
25 to 44	166	34.7
> 45	16	3.3
Total	479	100
Duration of Use		
<1 years	25	5.2
1 to 5 years	125	26.1
6 to 10 years	65	13.6
11 to 20 years	105	21.9
>20 years	159	33.2
Total	479	100
Frequency of use		
Daily	444	92.7
Some days of a week	17	3.5
Some days in a month	4	0.8
Not using now	14	2.9
Total	479	100

The age at which individuals started using tobacco varied a lot. One person started using tobacco (smoking) at the age of 8 years and another 4 persons (three smoking and the other smokeless) started at 10 years. More than half of the tobacco users started using tobacco during 15–24 years of age and 96.7 per cent began their tobacco habit before attaining the age of 44 years (Table-4.4). With regard to duration, 33.2 per cent of the Surveyed individuals have been using tobacco for a period of more than 20 years and 5.2 per cent were beginners. In fact, there were persons using tobacco for more than 40 years. However, duration is one factor, which is difficult to account because tobacco use is not a continuous process for many over lifetime. There would be several stoppages in between and it would be always difficult for the individuals to recollect the number of stoppages and duration of each stoppage. Out of those who can be termed as tobacco users, an overwhelming 92.7 per cent use it daily and the remaining persons either stopped using it or used it occasionally.

The survey found that 15 persons (4.5 per cent) stopped smoking altogether (self-reported) after using it for varying periods of time. However, the survey failed to detect any individual who stopped using khaini after starting use. This could be indicative of the degree of addiction attributable to khaini as opposed to smoking.

One sixth of smokers are highly addicted to tobacco and others have only lower level of addiction. This may be due to problems associated with adopting the Fagerstrom scale of western countries directly without standardizing to the conditions of our state. In the absence of other options, this scale has been used for the study to determine the magnitude of nicotine addition on a relative basis. But even this low prevalence of higher level of dependency should be considered seriously if we want to achieve the goal of 'Health for all by 2000'[28]. Even though about three fourths of the ever smokers (73.8 per cent) have the desire to stop smoking and 84.2 per cent stopped or like to stop

while in hospital for treatment, about half of them only have tried to stop smoking. Again only a few could stop smoking for longer periods. This clearly indicates the need for nicotine de-addiction programmes.

4.4. About Awareness among tobacco users and non users

Eventhough almost all people know that tobacco use has deleterious effects on health, majority were unaware of the specific diseases to which tobacco is causally related (Tables. 3.19 & 3.20). So an asthmatic patient may continue to smoke, as he/she is unaware of the association between smoking and asthma (COPD). A person comes to know that smoking can lead to heart disease, only when he goes for medical care for heart disease. Again, he may willfully forget this fact and start smoking again when the distressing symptoms cease. As the people are not aware of the hazards of passive smoking they are likely to be exposed to this risk as well. If they are aware of it, perhaps they can be utilized to discourage the smokers to avoid smoking in public places. Given the current levels of awareness of the health hazards of smokeless tobacco use, even before a person learns that pan chewing or khaini use can cause mouth cancer, he might have become a victim of that. Again many lung cancer patients may be dying with out knowing the predisposed cause of their illness. The awareness of health implications of tobacco use will help to reduce the tobacco use. This was proved by a 10-year follow up study in Ernakulam among 12212 individuals[45]. The intervention could reduce the tobacco use among men by 11.2 per cent, 8.3 and 6.3 in 2, 3 and 4 successive years. The stoppage rates among women were higher.

4.5. About Public opinion of users and non users

The people are willing to support the Government's activities in this context if it would formulate laws on banning the sale of tobacco to children and take steps to implement the available rules to prohibit advertisements and ban the use in public

places. The Cigarette Act of 1975 stipulates that packets of cigarettes and cigarette advertisements should display the statutory warning, 'Cigarette smoking is injurious to health'. Some state governments including Kerala have prohibited smoking in public places like cinema halls, buses, hospitals and government offices[46]. But, in many instances, the legal restrictions are either violated or circumvented. Many people may be knowing the existing rule on statutory warning and they feel that this is not effective in reducing tobacco use. This may be the reason for the less support for imposing statutory warning. The poor support for reducing strength of tobacco content may be either due to the demand for the total ban or due to their lack of knowledge on the dose related increase of health hazards.

4.6. Conclusions

The prevalence of tobacco use among men was high and among women it was low. Smoking and khaini use were more predominant than chewing and snuff use. The demographic factors like age and sex and socioeconomic factors like education, personal income and occupation influenced tobacco use. There was a group of men with higher level of nicotine dependency who needed nicotine replacement therapy for de-addiction. Eventhough almost all knew that tobacco has health hazards, majority was unaware of the causal relationship of specific diseases with the use of tobacco. The people, both tobacco users and non-users, were willing to support the activities of Government, if it chooses to make efforts to check the spread of tobacco epidemic.

4.7. Policy Suggestions

1. There is a need of better anti-tobacco programmes, emphasizing on the need to reduce smoking and khaini use.
2. Implement programmes for tobacco de-addiction. The facilities for counseling and nicotine replacement therapy (for those who have higher levels of nicotine dependency) are required for a successful deaddiction programme.
3. There is a need to strengthen health education about the hazards of tobacco use in schools and primary health centers and also using mass media appropriately to get this message to the community.
4. The present laws on the prohibition of tobacco advertisements and use of tobacco in public places have to be implemented effectively to curb the use of tobacco today and achieve a smoke free society tomorrow.
5. Formulate rules to prevent the sale of tobacco to children.

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References

1. WHO; 1997 'Smoking prevalence' in **Tobacco or health: A global status report,** WHO, Geneva, p10-18.
2. WHO; 1997 'Health effects' in **Tobacco or health: A global status report,** WHO Geneva, p44.
3. Luthra.K.U., et all.; 1992 'Tobacco control in India: problems and solutions' in **Control of Tobacco related Cancers and other diseases,** (eds.) Prakash CG, JF Hamner III and PR Murti, OUP, Bombay, p241-248.
4. WHO; 1997 'Part 2. Country profiles' in **Tobacco or health: A global status report,** WHO Geneva, p 416.
5. Vaidya.G.S, Naik. D.U; 1995 'Tobacco addiction in India' in **Tobacco Control – An International Journal -vol.1, No.3**, SAARC, p194 -205.
6. WHO; 1988 **Smokeless tobacco cotrol – Technical report series – 773**, WHO Geneva, p31.
7. Government of Kerala; 1998 'Nineth Five Year Plan - 1997 - 2002', in **Report of the Steering Committee on Health, Water supply & sanitation and Nutrition,** State Planning Board, p18.
8. Singh.B.R., et all.; 1998 'Validation of tobacco and alcohol intake questionnaire in relation to food intake for the 5 city study and a proposed classification for Indians', in **JAPI** Vol.46, July 1998, p587.
9. The Ministry of Planning; 1995 '**SARVEKSHANA, The journal of National Sample Survey organization.** Vol.- XV. GOI New Delhi.
10. KSSP-*Please see reference No.43.*
11. Chen Z-m., et all.; 1997 'Early Health Effects of the Emerging Tobacco Epidemic in China' A 16 year prospective study, in **JAMA** vol 278(18), p1500-1504.
12. Lam. T.H., et all.; 1997 'Mortality Attributable to Cigarette Smoking in China' in **JAMA** vol 278(18), p1505-1508.
13. Editorial., 1997 'Cigarette smoking in China - A message for India', in **NMJI** vol 10(2), p74-75.
14. Gupta.R, Agarwal.V, Gupta.VP,Soangra MR; 1997 'Correlation of smoking, BP levels, and HT prevalence in urban and rural subjects' in **JAPI**.vol.45(12), p919-923.

15. Krzyzanowski M, Robins RD and Lebowitz DM; 1993 'Smoking cessation and changes in Respiratory symptoms in 2 populations followed for 13 years' longitudinal study in Poland, in **International Journal of Epidemiology** vol.22(4), p 666 - 673.

16. Robins SA, Abbey ED and Lebowitz DM; 1993 'Passive smoking and c/c respiratory disease symptoms in non smoking adults' prospective cohort study in USA, in **International Journal of Epidemiology**, vol.22(5), p809 - 817.

17. 1997 'Smoking and relative body weight: an international perspective from the WHO MONICA project', in **Journal of Epidemiology and Community Health**, vol. 51(3), p 252.

18. Wersall JP, Eklund G; 1998 'The Decline of smoking among Swedish men', in **International Journal of Epidemiology** (27), p20.

19. Caraballo, Ralph S., et. al.; 1998 'Racial and ethnic difference in serum cotinine levels of cigarette smokers', in **JAMA,** Volume 280(2), p135-139

20. 1998 'Mortality in females and males in relation to smoking'. - a cohort study in Copenhagen, in **International Journal of Epidemiology** (27), p27,

21. Reijneveld S A; 1998 'The impact of individual, area characteristic, SES difference in urban setting in smoking.'- in Netherlands, in **International Journal of Epidemiology**(27), p33-40.

22. Morris K; 1998 'Report points to formula 1 role in teen smoking.' - US study, **The Lancet**, vol. 352, No. 9123, 18 th July 1998, page 205.

23. Shanmughanandan.S; 1997 'Epidemiological perspectives of smoking related diseases in developing countries: A case study Madurai district' in **Abstract: 10th World Conference on Tobacco or Health, Beijing**, China, p154.

24. Shanmughanandan.S; 1997 'Tobacco consumption and its impact on Human health: A case study of youths in Madurai city, Tamil Nadu, India', in **Abstract: 10th World Conference on Tobacco or Health,** Beijing, China, p154.

25. Shanmughanandan.S; 1997 'Tobacco chewing and rural health behaviour among women: A case study of youths in Madurai city, Tamil Nadu, India' in **Abstract: 10th World Conference on Tobacco or Health,** Beijing, China, p155.

26. Guptha et al, 1997 'Correlation of smoking, blood pressure levels and hypertension prevalence in urban and rural subjects' **in JAPI** vol 45(12), p919-922.

27. WHO; 1988 **Smokeless tobacco cotrol – Technical report series – 773**, WHO Geneva, p18.

28. WHO; 1988 **Smokeless tobacco cotrol – Technical report series – 773**, WHO Geneva, p5- 7.

29. WHO; 1988 **Smokeless tobacco cotrol – Technical report series – 773**, WHO Geneva, p22.

30. Gupta.P.C.,et al, 1992 'A 10 year follow up study for primary prevention of oral cancer among Indian villagers' in "Control of Tobacco-Related Cancers and other Diseases." Proceedings of an international symposium,1990, TIFR, Bombay, p307-314

31. WHO; 1988 **Smokeless tobacco cotrol – Technical report series – 773**, WHO Geneva, p21.

32. WHO, 1998 'Action for tobacco control' in **Guidelines for Controlling and Monitoring the Tobacco Epidemic'** WHO Geneva, p3

33. WHO; 1997 'Tobacco industry' **in Tobacco or health: A global status report,** WHO Geneva, p39-41.

34. Health Care Promotion Trust; (not known) 'Tobacco Use' National Institute of Primary Health Care,New Delhi.

35. Luthra.K.U., et all.; 1992 'Tobacco control in India: problems and solutions' in **Control of Tobacco related Cancers and other diseases,** (eds.) Prakash CG, JE Hamner III and PR Murti, OUP, Bombay, p243.

36. WHO; 1997 'Types of tobacco products' in **Tobacco or health : A global status report,** WHO,Geneva, p7.

37. WHO, 1998 'The need for tobacco control' in **Guidelines for Controlling and Monitoring the Tobacco Epidemic,** WHO Geneva, p2-6.

38. Gopalakrishnan and Radhakrishnan; 1997 'Changing trend of tobacco use: Focus on adolescents in Trivandrum city' (unpublished)

39. WHO, 1998 'Monitoring tobacco use' in **Guidelines for Controlling and Monitoring the Tobacco Epidemic,** WHO Geneva, p76-77.

40. WHO, 1998 'Monitoring tobacco consumption' in **Guidelines for Controlling and Monitoring the Tobacco Epidemic,** WHO Geneva, p71.

41. WHO, 1998 'Monitoring tobacco use' in **Guidelines for Controlling and Monitoring the Tobacco Epidemic,** WHO Geneva, p2-6.

42. Heatherton T; 1991 'The Fagerstrom Test for nicotine dependence, a revision questionnaire' in **British Journal of addiction**, p1119-1127.

43. Kannan KP, Thankappan KR, Raman Kutty V and Aravindan KP; 1991 'Consumption of Tobacco and Alcohol' in **Health and Development in Rural Kerala**, Kerala Sastra Sahitya Parishad, Trivandrum, p98-105.

44. Vaidya GS, Vaidya NS and Naik UD, 1992; 'Epidemiology of tobacco habits in Goa, India'; in **Control of Tobacco related Cancers and other diseases,** (eds.) Prakash CG, JE Hamner III and PR Murti, OUP, Bombay, p 315-320.

45. Gupta PC., et all; 1992 'A 10 year follow-up study for primary prevention of oral cancer among Indian villagers' in **Control of Tobacco related Cancers and other diseases,** (eds.) Prakash CG, JE Hamner III and PR Murti, OUP, Bombay, p308-313.

Bibliography

1. IARC 1986, '**IARC Monographs on the Evaluation of the Carcinogenic risks of chemicals to Humans – Tobacco smoking**', Volume 38, IARC, France.

2. WHO, 1988 '**Smokeless tobacco cotrol – Technical report series – 773**', WHO, Geneva.

3. WHO, 1992, '**Women and Tobacco**',WHO, Geneva

4. WHO, 1997 '**Tobacco or Health : A global status report**',WHO, Geneva

5. WHO, 1998, '**Guidelines for Controlling and Monitoring the Tobacco Epidemic',** WHO, Geneva

Annexure – 1

CONSUMPTION OF TOBACCO PRODUCTS IN A RURAL COMMUNITY IN KERALA

Interview Schedule (Household)

Name of the Household Head .....
Ward No..... House No .....
Name of the respondent .....
Address
.....
..
.....
..
.....
..

1. Total **monthly income** of the family from all sources Rs .....
2. Condition of the house (tick the appropriate box)
   - 2.1 Roof ..... ☐ Thatched ☐ tiled ☐ concrete
   - 2.2 wall ..... ☐ Mud ☐ brick ☐ plastered
   - 2.3 floor ..... ☐ Mud ☐ cement ☐ marble (mosaic)
3. Property ownership details (tick the appropriate box)
   Own a ☐ House ☐ Land (..... Cents) ☐ Car ☐ Scooter ☐ Auto ☐ Phone
4. Details of family members

Sl. No	Name	Age*	Sex♣	Education	Occupation	Monthly Income	Tobacco habit*
4.1							
4.2							
4.3							
4.4							
4.5							
4.6							

* number of completed years ♣ M for male & F for female
* (a)cigarette (b) bidi © Chewing (d) Snuff (e) none

Interview Schedule (individual)

Ward No..... HH No..... Individual No.....

6. Have you ever used ☐ cigarette ☐ bidi ☐ Chewing pan ☐ thumpak ☐ Snuff

7. If yes, in life time have you

☐ smoked >100 cigarettes /bidi/ both together ☐ chewed local pan >100 times

☐ chewed >100 grams of thumpak◆ ☐ dipped snuff >100 times

(◆This is 10 packets of Sambhu or 25 small packets of Panparag or equivalent)

Note : If yes to any one of the above, fill the tobacco section (see next page)

General section (to all participants)

8. Tobacco habit is injurious to health..... ☐ Yes ☐ No

9. Which tobacco product(s) is/are related with the given diseases.(yes/no/don't know)

	Diseases	cigarette	bidi	chewing pan	thumpak	snuff
9.1	Hypertension					
9.2	Heart disease					
9.3	Asthma					
.4	Lung Cancer					
9.5	Mouth Cancer					
9.6	any other					
9.7	Diseases in persons around					
9.8	Any benefits					

10. Do you agree with any legal restrictions on tobacco use or sale ..... ☐ Yes ☐ No

11. If yes, which of these are effective methods to reduce the tobacco use.
(if agrees put '✓' ; if don't agrees put '✖'; if don't know put '?')

☐ **total** ban of **sale** of tobacco ☐ prohibition of tobacco sale to **children**

☐ ban of advertisement of tobacco ☐ reduction in the toxin content

☐ prohibition of smoking in all public places

☐ write 'tobacco is injurious to health' on tobacco packets

12.1 Name the tobacco products known to you .....

12.2 Name the packets known to you, which are used for chewing

.....

.....

13. Remarks of the respondent (if any) .....

14. Remarks of the interviewer .....

Date ..... Interviewer .....

Tobacco Users Section

Ward No..... HH No..... Individual No.....

			smoking				chewing		thumpak	snuff	
			filtered cigarett	nonfilt cigarett	bi di	oth ers	local pan only	localpan + tobacco	company packets	nasal	oral
14	age started										
15	duration of use in years										
16	pattern of use♠	Now									
17		1 year back									
18	quantity per day	Now									
19		1 year back									
20	money spent per day	Now									
21		1 year back									
22	age stopped, if stopped										
23	Duration after the last use										

♠ a) daily b) some days of a week c) some days in 2 weeks d) some days in 3weeks e) some days in a month f) still rarely g)stopped

24. Does your use follow any variation with season / work /others .....☐ Yes ☐ No
If yes, how ?

		smoking	chewing	thumpak	snuff
24.1	seasonal variation				
24.2	variation with work				
24.3	others				

	Select a /b /c / d or e	smoking	chewing	thumbak	snuff
25.1	When will you use tobacco for the first time after waking up in the morning? **a)** within 5 minutes **b)** between 6 to 30min **c)** between 31 to 60 min **d)** after 60 min				
25.2	When do you use maximum quantity in a day **a)** 1st hour in the morning **b)** in the subsequent hours				
26.1	Can you stop tobacco use ?				
26.2	If no, can you manage to avoid smoking in places where smoking is prohibited?				
27.1	Have you been severely sick after starting smoking / chewing/ thumpak use / snuff dipping				
27.2	If yes, have you used tobacco, when severely sick				
27.3	If no, do you use tobacco, even when severely sick				
28	What would you hate the most to give up? tobacco use / any thing else	smoking/ others	chewing/ others	thumpak/ others	Snuff/ other
29.1	Would you like to stop tobacco use?				
29.2	Why? (for both yes & no)	1. smoking 2. chewing 3. thumpak 4.snuff			
30.1	Have you ever tried to stop using tobacco?				
30.2	Why? (for both yes & no)	1. smoking 2. chewing 3. thumpak 4.snuff			
30.3	If yes, tick the symptoms experienced then a)increased appetite or weight gain b) anxiety c) depressed mood d) insomnia e) difficulty in concentrating f) restlessness g) craving for tobacco h) increased anger i)others (specify)				

30.1. Details of previous stopping experience (no of times, period, why restarted.....)

Annexure – 2

Guideline for the interviewer

1. Include people of age 15 years and above only.
2. Interview each individual separately. Youngsters should not be interviewed in front of parents or close relatives.
3. Though there are separate columns for smoking, chewing, khaini use and snuff dipping use only the column(s) relevant for the individual.
4. For question number 1 : The family income should include the individual income from occupation of all members of the family and income from other sources, if any, like agriculture, poultry, cow, goat, rented houses, deposited money etc....
5. For question number 4 : Write the exact occupation which may be grouped later.
6. For question number 4 : Monthly income is the income of that particular person for one month. If he/she is not a salaried person, calculate the monthly income by asking the wage per day and the average number of days of work available per week / month.

   E.g.; if the wage per day is Rs.100- and he /she gets job for 5 days of a week, then the number of days of work in a month = 5 x 4

   Monthly income = (5 x 4) x 100 = Rs.2000-
7. For question number 4 : In the column of tobacco habit, write the corresponding alphabet as given at the bottom of the question 4. (**a** for smoking, **b** for pan chewing, **c** for khaini use, **d** for snuff dipping and **e** for none (total abstinence from any tobacco product).
8. For Individual form, Individual No is the Serial No in question number 4 e.g.: 4.1, 4.2, ...
9. Thampaku is the local common name for the khaini products which is a mixture of lime and tobacco usually and sometimes it may contain aracu nut also. The popular brands ***are Shambu, Pan parag, Hans & Tulsi*** and less popular ones are ***ARR, Tiger brand & Udma patta***. People use it in 2 ways : Chewing along with betal quid instead of tobacco or by putting in between gum and lip

   Some people think it as an areca nut preparation and does not contain tobacco. There are some other preparations available in the market viz., Roja pak & Nija pak which are arache nut preparations with out tobacco. If using anyone of ***Shambu, Pan parag, Hans , Tulsi, ARR, Tiger brand or Udma patta*** then include as a khaini user. If using Roja pak or Nija pak, don't include as a khaini user.
10. For question number 6 : If the person had used any of the tobacco products at least once in the life time, put '✓' in the corresponding box.
11. For question number 7 : Put '✓' in the corresponding box , only if the person had used the quantity mentioned along with each product.
12. For question number 9 : Each column has 3 options –Yes / No / Don't know. If the person thinks that particular tobacco habit will produce the mentioned disease then write 'Y' or 'Yes' in the corresponding column. If he/she don't think that particular tobacco habit will produce the mentioned disease then write 'N' or 'No". If he/she don't know the relationship between the tobacco habit and disease write 'D.K'.
13. For question number 11 : If agrees with the opinion put '✓' ; if doesn't agree put '✖'; and if unable to form an opinion or don't know put '?'. If he is not willing to

13. For question number 11 : If agrees with the opinion put '✓' ; if doesn't agree put '✖'; and if unable to form an opinion or don't know put '?'. If he is not willing to express the opinion, then don't mark anything. Consider each one as a separate question.
14. Question number 12 : This is to find whether the people know that the cigarette, bidi & khaini are tobacco products. This will also help to find the different brand names of khaini products available in the market.
15. For tobacco users section, for each question, there will be 4 major columns, one for each tobacco habit. Fill the column(s) relevant for the particular person.
16. For question number 14 : Age started is the age of onset of this behaviour.
17. For question number 14 : Duration may not be the difference between present age and the age of onset. He/she might have stopped some periods in between.
18. For question number 15 &16 : Write a/b/c/d/e/f or g as the case may be .
19. For question number 17 : Calculate the expense per day and write in rupees.

    E.g.: He buys 2 packets of bidis (28 bidis), 1packet cigarettes (10 cigarettes) and 1 match box once in 2 days. The cost of bidi is Rs.2 – per packet, of cigarette is Rs. 8 – per packet and of match box is Rs. 0.5- per packet. Total cost is Rs. 12.5- for 2 days. So write as 6.25 or 12.5 / 2. (if difficult to work out)
20. For question number 25 to 30 : Write a /b /c /d as per the instructions given in the questionnaire.

Message

" Tobacco is injurious to Health

Shambu, Pan parag, Hans , Tulsi, ARR, Tiger brand and Udma patta
contain Tobacco ."

Convey the message to all participants after the completion of the survey.

ANNEXURE -3

Results of regression of some occupation groups not included in the text.

Table-3.22b. Regression results by occupation (House wives - all tobacco users) *.

Dependent variable: total expenditure (in Rs) on smokeless tobacco products.
R square : 0.232 **n = 21**

Variables	β	SE β	Significant p value
Age	0.083	.057	0.160
Education	-.221	.176	0.223

* All housewives were females. So removed the sex variable from regression.

Table Smokers among Laborers
Dependent Variable: total expenditure in Rs on smoking
R square: 0.016 n = 352

No female smoker among this group. So removed the sex variable from regression.

Dependent Variable: total expenditure in Rs on smoking
R square: 0.044 n = 199

Variables	β	SE β	P value
Age	.027	.012	0.027
Education	-.021	.040	0.601
Income	0.0003	0.0002	0.158

Smokeless tobacco users among Laborers (+sex)
Dependent variable total expenditure (in Rs) on smokeless tobacco products.
R square : 0.034 **n = 144**

Variables	β	SE β	P value
Age	.012	.017	0.497
Education	.029	.057	0.614
Income	0.0005	0.0003	0.128
Sex	-.762	-.079	0.375

Smokers among self-employed group.

There was no female smoker among this group. So removed the sex variable from regression.

Dependent Variable: total expenditure in Rs on smoking
R square: 0.001 n = 90

Variables	β	SE β	P value
Age	.008	.136	0.954
Education	-.163	.607	0.789
Income	0.0006	.002	0.803

Smokeless tobacco users among Self Employed group.(+sex)
Dependent variable total expenditure (in Rs) on smokeless tobacco products.
R square : 0.22 n = 65

Variables	β	SE β	P value
Age	.075	.468	0.000
Education	.174	.089	0.055
Income	-0.0008	0.0003	0.011
Sex	2.207	.176	0.117

Smokers among Salaried group.

Dependent Variable: total expenditure in Rs on smoking
R square: 0.032 n = 26

Variables	β	SE β	P value
Age	.265	.297	0.380
Education	.249	1.138	0.828
Income	0.000008	.004	0.998

Smokeless tobacco users among Salaried group.
Dependent variable total expenditure (in Rs) on smokeless tobacco products.
R square : n = 6

NOT DONE

Smokers among Unemployed

There was no female smoker among this group. So removed the sex variable from regression

Dependent Variable: total expenditure in Rs on smoking

R square: 0.160 n = 26

Variables	β	SE β	P value
Age	-.410	.438	0.358
Education	.291	1.877	0.878

Smokeless tobacco users among Unemployed – including sex variable

Dependent variable total expenditure (in Rs) on smokeless tobacco products.

R square : 0.022 n = 43

Variables	β	SE. β	Significant P value
Age	-.013	.022	0.557
Education	-.036	.098	0.716
Sex	.325	.896	0.718

Smokeless tobacco users among Unemployed – excluding sex variable

Dependent variable total expenditure (in Rs) on smokeless tobacco products.

R square : 0.019 n = 44

Variables	β	SE. β	Significant P value
Age	-.016	.020	0.431
Education	-.041	.096	0.669