SMOKELESS TOBACCO USE AMONG RURAL KADAZAN WOMEN IN SABAH, MALAYSIA

Chong-Ying Gan

Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, 59100 Kuala Lumpur, Malaysia

Abstract. A survey was conducted to document and bring attention to the use of smokeless tobacco among rural Kadazan women in Sabah, East Malaysia. Of the 472 women interviewed, 59.5% had used tobacco among the ingredients that they habitually chewed. Women with low education were more likely to be chewers. The chewing habit was usually acquired during the teenage years and the practice was perceived mainly as a cultural norm. 73.3% of these smokeless tobacco users were unaware of any adverse health effect of this type of tobacco use as compared to 53.9% of the non-tobacco users. The high prevalence of smokeless tobacco use is easily maintained as tobacco is cheap, locally produced and its use is socially accepted. The low level educational status of the women compounds the problem and intervention programs to curb this form of tobacco use is warranted.

INTRODUCTION

The use of smokeless tobacco occurs worldwide (IARC, 1985). The product used and the customs associated with its use varies. In the USA and in Europe, the smokeless-tobacco products used are predominantly snuff and "chewing tobacco". In many Asian countries, tobacco is often chewed with betel quid which is a mixture of areaca nut lime and other ingredients all wrapped in a betel leaf for chewing (Muir and Kirk, 1960; Dayal *et al*, 1978; Bhousle *et al*, 1979). Information on smokeless tobacco use are available in industrialized countries such as the USA, Sweden and Canada (WHO, 1988). Among the developing countries of Asia, smokeless tobacco usage is well studied in India and Pakistan but documentation of these practices are limited in the Southeast Asian countries (IARC, 1985; WHO, 1988). As the estimation of the magnitude of tobacco usage in a country is usually through using parameters such as per capita manufactured cigarette consumption, there can be a great underestimation of the tobacco threat in communities where locally grown tobacco is smoked or chewed and prevalence data of these habits remain unknown.

In the state of Sabah in East Malaysia, tobacco is often grown as a cash crop and tobacco chewing (with betel quid) is a habit commonly practised among some indigenous groups particularly among the women. Apart from one study conducted in the district of Kota Belud which documented tobacco usage in rural Sabah (Gan, 1991), there has been no study to describe or to ascertain the prevalence of the practice. This study was conducted to document the prevalence and the practice of betel chewing with tobacco among one of the major indigenous groups in Sabah, the Kadazans. The study focuses on rural Kadazan women as women were more likely to chew tobacco (Gan, 1991). The health knowledge of these women is also assessed. The study hopes to bring attention to the usage of smokeless tobacco among the indigenous people of Sabah so that anti-tobacco measures can be directed to the communities which need health education most.

MATERIALS AND METHODS

The survey was conducted in the district of Tambunan in the interior of Sabah, a state of East Malaysia on the island of Borneo (Fig 1). The 1984 census showed 21,180 persons living in the district, the majority being Kadazans (90.4%). Agricultural activities (rice, coffee, vegetable and tobacco growing) form the occupation of 95% of the working population.

The people reside in the town of Tambunan and 103 villages in the district. All the villages were listed and clusters of villages were identified: some clusters were villages served by static health clinics (villages nearer the town) and some clusters were villages served by mobile clinics (remote villages). Four clusters of villages were selected: 2 from the

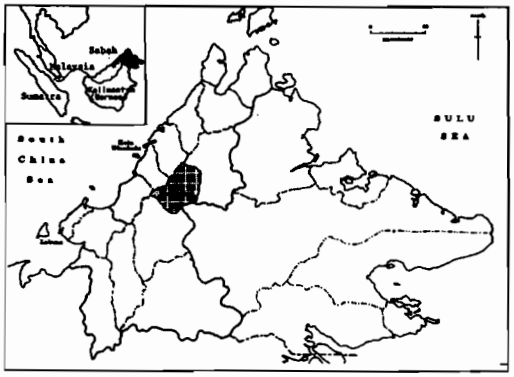

Fig 1–Tambunan District, Sabah, Malaysia.

clusters of remote villages and 2 from the clusters of nearby villages. This selection ensured that villagers near the town as well as those in the remote areas were represented. The number of households and the population size of each village in these 4 clusters were noted. Twenty-three villages were selected from these 4 clusters after an estimation was made that they would yield at least 800 households and a minimum of 400 women 18 years and above would be included in the sample.

A house to house survey was not feasible as farm houses were widely scattered and were usually accessible by foot only. The headman of each village sent word to every household to participate in the survey and an appointed date and venue (usually the village community hall) was fixed for the interview. The villagers were known to respond positively to the headman's requests but it is expected that a small proportion of women would not participate for various reasons. The interviewers included 3 medical technologists experienced in community surveys and 2 local public health nurses. A structured questionnaire was used in the survey. The survey was conducted within a 3 week period in March 1992.

RESULTS

A total of 472 Kadazan women with an age range of 18 to 90 years participated in the survey. 41.3% of these women have had no formal education, 31.4% have had 6 years or less schooling, 26.9% have had up to 11 years of schooling while the educational level of 0.4% was not recorded.

69.5% of these women revealed that they had a chewing habit. A number of products in various combinations were chewed: pinang (the fruit of Areca catechu L), sireh (the leaf of the vine Piper betel L), kapur (lime from boiled sea-shells), gambir (a preparation from the leaves and twigs of the shrub Uncaria gambir) and tobacco. A detailed history of what combinations were chewed revealed that 59.5% of the women had included tobacco as an ingredient while 10% of the women had excluded tobacco. Table 1 shows the various combinations of products chewed. Of those who used tobacco as an ingredient in their chewing habit, all other ingredients were often chewed together first and tobacco was added last. The resultant quid was then kept in the mouth or between the lips.

The overall prevalence of those involved in smokeless tobacco use was 281 (59.5%). The age-specific prevalence rates of those who chewed tobacco showed an increase in the practice with increasing age as shown in Table 2. This trend was both linear and significant (chi-square for trend: 5.05, $p = 0.02$). Prevalence rates by level of education (Table 3) showed that the better educated were less likely to chew. A trend which was linear and significant was found (chi-square for trend: 8.64, $p = 0.003$). When the women were grouped into those with low education (6 years of education or less) and those with

Table 1

Combinations of ingredients chewed by Kadazan women.

Ingredients used	No. with chewing habit	% (n = 472)
Tobacco, betel leaf, areca nut, lime, gambir	148	31.3
Tobacco, betel leaf, areca nut, lime	108	22.9
Tobacco, lime, and areca nut	1	0.2
Tobacco and lime	11	2.3
Tobacco and areca nut	8	1.7
Tobacco only	5	1.1
Various combinations of above ingredients but without tobacco	47	10.0
Total No. with a chewing habit	328	69.5

Note: 281 (59.5%) of the women included tobacco as an ingredient (tobacco chewers)

secondary school education, it was found that women with low education level were 1.8 times more likely to be chewers (odds ratio = 1.82, confidence interval: 1.19-2.82). After adjustment for age, those with low education were 1.56 times more likely to be chewers than those with secondary education (Mantel-Haenzal weighted odds ratio : 1.56, Cornfield 95% confidence limits : 0.97-2.51). However, this did not quite reach statistical significance.

Table 2

Age-specific prevalence rates of smokeless tobacco users.

Age (years)	Tobacco users	Prevalence rate (%)
< 20	7	43.8
20-29	89	53.3
30-44	111	63.8
45-64	57	64.0
65 and above	17	65.4
Total	281	

Table 3

Prevalence of smokeless tobacco users by educational level.

Educational level	Total women	Tobacco users	Prevalence rate (%)
No formal education	195	128	65.6
Primary (1 to 6)	148	90	60.8
Secondary (7 to 11)	127	62	48.8
Not recorded	2	1	50.0
Total	472	281	59.5

It was difficult to determine the amount of tobacco used per day by the chewers as most users said that they used "a small amount" or "a pinch" of tobacco in each preparation for chewing. The frequency of fresh preparations chewed per day gave an idea of the amount of tobacco used per day. As shown in Table 4, the majority of chewers used 3 or 4 fresh preparations per day. The chewed quid was usually kept in the mouth from 10 minutes to 2 hours. Two retained

Table 4

Number of fresh preparations used per day.

Fresh preparations used per day	No. of tobacco users	%
1 or 2	81	28.8
3 or 4	130	46.3
5 to 10	4	14.9
More than 10	1	0.4
Varies daily	27	9.6
Total	281	100.0

Table 5

Duration a fresh preparation was kept in mouth.

Duration	No.	%
Less than 10 minutes	38	13.5
10 min to < 1 hour	105	37.4
1 to 2 hour	126	44.8
3 to 4 hour	10	3.6
Throughout the day	2	0.7
Total	281	100.0

the chewed quid in their mouths throughout the day (Table 5). The chewed quid was mainly kept between the upper or lower lip and gum (80.4%) but 15.7% kept the chewed quid between the lips and 3.9% kept it in the cheek.

The main source of each chewers's tobacco supply was noted. 73.7% of chewers purchased tobacco from the "tamu" (the local market held biweekly in an open space) where numerous tobacco stalls are found. 22.1% grew their own tobacco while some 6% received their supply from friends who either grew or bought the tobacco. All tobacco used were locally grown and processed.

The majority (54.8%) of smokeless tobacco users acquired the habit during their teenage years (Table 6). 62.6% had been chewing tobacco for more than 10 years as shown in Table 7.

The reasons given for chewing among those who used tobacco (Table 8) indicate that the practice is perceived as a cultural norm.

Table 6

Age the habit was acquired.

Age (years)	No.	%
< 10	14	5.0
10-19	154	54.8
20-29	77	27.4
30-39	20	7.1
40 and above	5	1.8
Unable to recall	11	3.9
Total	281	100.0

Table 7

Duration of habit at time of survey.

Years of chewing	No.	%
< 1	2	0.7
1 to 4	33	11.7
5 to 9	59	21.0
10 to 20	91	32.4
> 20	85	30.2
Unable to recall	11	4.0
Total	281	100.0

When asked whether they knew of any health problems associated with tobacco chewing, 73.3% of the chewers compared to 53.9% of non-chewers of tobacco were unaware of any adverse health effects. Analysis showed that chewers were less likely to be aware of associated health problems (odds ratio = 0.43, confidence interval : 0.28-0.64, chi-square = 18.9, p value < 0.001). Table 9 shows the type of ill effects named by the respondents. A total of 22 (7.9%) chewers were able to name mouth cancer or ulcers as an associated problem compared to 13.6% of non-chewers.

Table 8

Reasons for chewing among those who included tobacco.

Reasons for chewing	No.	%
Cultural norm, socialising and peer pressure	199	70.8
For fun	45	16.0
Craving during pregnancy	22	7.8
Postnatal craving/strengthens teeth	11	3.9
Relieve toothache	1	0.4
No clear reason given	3	1.1
Total	281	100.0

Table 9

Awareness of the adverse effects of tobacco chewing.

Adverse effects of chewing	Percentage of tobacco chewers (n = 281)	Percentage of non-tobacco users (n = 191)
Not aware chewing is associated with health problems	73.3	53.9
Mouth ulcers	4.7	5.2
Mouth cancer	3.2	8.4
Dental caries	3.5	7.3
Toothache	0.4	1.6
Adverse effects to pregnancy	1.4	0.5
Others: teeth and lips stained, lung problems, giddiness	15.9	26.7

Except for those unaware of adverse effects more than one response can be given.

DISCUSSION

The findings of this cross-sectional survey warrants attention and concern. There is a very high prevalence of tobacco chewing among rural Kadazan women and very little knowledge among them regarding health risks. Evaluation of the carcinogenic risk of chemicals to humans by the International Agency For Research On Cancer (1985) concludes that there is sufficient evidence that the habit of chewing betel quid containing tobacco is carcinogenic to humans. There is however inadequate evidence that the habit of chewing betel quid without tobacco is carcinogenic to humans. Numerous studies conducted in India (WHO, 1988; Jusswalla and Deshpande, 1971; Pindborg, 1972; Gupta *et al*, 1986a, b; 1980; Mehta *et al*, 1972), have associated oral cancers with tobacco chewing. Oesophageal cancer (Jussawalla and Deshpande, 1971; NIH, 1986), pharyngeal cancer (Sangvi *et al*, 1955), laryngeal cancer (Jussawalla and Deshpande, 1971), cancer of the pancreas and urinary tract cancers (Heuch *et al*, 1983; Bennington and Laubscher, 1968) have all been associated with such smokeless tobacco use. At the habitual sites of placement of the chewed tobacco, oral leukoplakia and other oral lesions have been found as reported in many studies including, cross-sectional studies (Mehta *et al*, 1969; Gupta, 1984) which confirmed a dose response relationship for oral leukoplakia and smokeless tobacco. Gingival recession and related oral mucosa pathology have also been reported at the site of tobacco placement (Poulson *et al*, 1984). Dental caries and degenerative changes in the salivary glands (WHO, 1988) have also been reported. Nicotine in smokeless tobacco produces cardiovascular effects as seen in cigarette smokers (Cryer *et al*, 1976; Squires *et al*, 1984). Stillbirths (Krishna, 1978) and low birthweight (Verma *et al*, 1983) have been associated with those who chewed tobacco during pregnancy.

The problem of a high prevalence of smokeless tobacco use in this study is compounded by the facts that the women have had little or no schooling, are mostly unaware of the associated adverse health risks and can sustain the habit since tobacco is cheap and easily available. Most women start the habit when young which means that the majority will chew throughout their lifetime. Although the age-specific rates increased with age, as high as 43.8% of those below 20 years have already acquired the habit. This means that chewers have many years of accumulated exposure for cancers and other pathological lesions to develop. Of the current chewers, as high as 62.6% had been practising the habit for more than 10 years. In this study, about half the chewers had kept the chewed tobacco in the mouth for more than one hour to the entire day. This practice is certainly conducive to pathological changes in the buccal mucosa. It was difficult to measure the exact amount of tobacco used per day as each chewer had her own special concoction. The number of fresh preparations used suggest that the amount of tobacco used is enough to cause concern. The nicotinic effects of this type of smokeless tobacco use is undoubtedly a threat. That all the women continue the habit during pregnancy means that fetal toxicity is a likely consequence. Available evidence concludes that some users of smokeless tobacco are unable to abstain permanently from their habit despite the fact that ill health had resulted from it (Connolly 1986). The community studied would not be exempted from this fact.

Tobacco chewing is a common practice among women and is a practice socially accepted by the community. The reasons given for chewing tobacco indicate that it is perceived as a 'cultural' norm among Kadazan women. In the developed countries, it has been found that the prevalence of smoking decreased with increasing education (Pierce, 1989) and that the rate of decline in smoking was also greater among the better educated in nearly all developed countries. The community studied has little understanding of risks in smokeless tobacco use. A vigorous system to deliver health information to the community is warranted.

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