

Is Chaalia/Pan Masala harmful for health? Practices and knowledge of children of schools in Mahmoodabad and Chanesar Goth, Karachi

Sameena Shah,¹ Riaz Qureshi,² Iqbal Azam³

Department of Family Medicine,^{1,2} Department of Community Health Sciences,³ Aga Khan University and Hospital, Stadium Road, Karachi.

Abstract

Objective: To determine the practices and knowledge of harmful effects regarding use of Chaalia and Pan Masala in three schools of Mahmoodabad and Chanesar Goth, Jamshed Town, Karachi, Pakistan.

Methods: To achieve the objective a cross-sectional design was used in three government schools of Mahmoodabad and Chanesar Goth, Jamshed Town, Karachi. Students of either gender drawn from these schools fulfilling the inclusion and exclusion criteria were interviewed using a pre-coded structured questionnaire. Along with demographic data, questions regarding frequency of Chaalia and Pan Masala use, practices of this habit in friends and family and place of procurement of these substances, were inquired.

Knowledge was assessed about harmful effects and its source of information. In addition, practices in relation to that knowledge were assessed.

Results: A total of 370 students were interviewed over a period of six weeks, of which 205 (55.4%) were boys. The ages of the students were between 10 and 15 years. Thirty one percent of the fathers and 62% of the mothers were uneducated. The frequency of use of any brand of Chaalia was found to be 94% and that of Pan Masala was 73.8%. Eighty five percent of them were regular users. A large majority (88%) procured the substances themselves from near their homes. Ninety five percent of the children had friends with the same habits. Eighty four percent were using the substances in full knowledge of their families. Chaalia was considered harmful for health by 96% and Pan Masala by 60%. Good taste was cited as a reason for continuing the habit by 88.5% of the children and use by friends by 57%. Knowledge about established harmful effects was variable. Knowledge about harmful effects was high in both "daily" and "less than daily users".

Conclusion: The frequency of habits of Chaalia and Pan Masala chewing, by school children in lower socio-economic areas is extremely high. The probable reasons for this high frequency are taste, the widespread use of these substances by family members and friends, low cost and easy availability (JPMA 59:550; 2009).

Introduction

It is a known fact that Areca nut is the fourth most commonly used psychoactive substance in the world being chewed regularly by at least 10% of the world population in different forms.¹ Areca nut chewing, by itself or in combination with scents, condiments or sweeteners is an accepted practice in parts of the Western Pacific and many South and South East Asian countries, including India and Pakistan.²⁻⁴

In Urdu, Areca nut is called 'Chaalia' or 'Supari'. Its use is deeply ingrained in the socio-cultural practices of our nation. In Pakistan, the traditional method of use is the pan or quid. It is assembled by smearing a betel leaf with catechu paste/Kattha, slaked lime/Choona, chopped areca nut, a variety of condiments, sweeteners, spices, flavourings and folding it up in the shape of a quid).²⁻⁵ Tobacco flakes are often added by users to enhance its flavour and potency.¹² Areca and catechu has become available as plain or sweetened Chaalia/Supari and as an ingredient of 'Pan Masala' in brightly colored little sachets. Pan Masala is a dry mixture of areca nut, lime, catechu, spices, other unspecified ingredients and often tobacco. Originating in India, it became available in the sub-continent in the 1970's.^{3,6,7}

The habit of Sweetened Supari and Pan Masala chewing are becoming increasingly popular among school-going children, some as young as four to five years of age.²

A greater concern is the evidence that oral submucous fibrosis presents at younger ages in habitual chewers of areca nut, quid and Pan Masala.^{8,12} Areca, catechu and smokeless tobacco have been established to cause one of the ten leading cancer i.e. oral cancer, irreversible gingival recession, oral submucous fibrosis, other oral pathologies, worsening of asthma, nicotine addiction, cardiovascular diseases, accidental inhalation and its consequent complications in children.^{1,2,4-7,10,11} Many people believe that consuming sweetened or plain Chaalia is not harmful in comparison to its use in combination with betel leaf, slaked lime and tobacco. In addition, their promotion by sports-people and pop-singers in advertisements affect adolescents' perceptions and behaviour. They appear on television and Pakistani/ Indian video films and are playing a major role in promoting their use in all age groups, including children.

Few studies have been done in children to determine prevalence and characteristics of this harmful and addictive habit. This study was done to find the practices of using these substances and knowledge about harmful effects of Chaalia and Pan Masala in children of schools in Mahmoodabad and Chanesar Goth, Jamshed Town, Karachi.

Methods

Mahmoodabad and Chanesar Goth are low socio-economic areas with an average income of Rs5000-6000 per month and a multi-ethnic population. The cross-sectional study was conducted in one girl's and two boy's government schools, over a period of four weeks. These schools were selected as majority of their students are from Akhtar Colony, Chanesar Goth, Mahmoodabad and other adjoining areas that fall within the jurisdiction of Jamshed Town and are representative of other schools in the area. Prior to conducting the interviews, permission was taken from the Principals of each school. The average number of students in each school was 700 with 140 students in each grade divided into 4-5 sections. A total of 370 students comprising of a representative sample from each section, of both sexes were included. Students over ten years and below sixteen years of age present at the time of the survey were interviewed using a pre-coded questionnaire after taking verbal consent. Children from different classes were interviewed each day to avoid re-interview.

Knowledge of Chaalia and Pan Masala being harmful for health was assessed in two categories of 'present' or 'not present'. Information of ten established harmful effects was collected along with an open ended question. Inquiring regarding practices, users were grouped into 'daily', 'once', 'twice' or 'thrice a week' and 'less than weekly' users of Chaalia and Pan Masala. Time passed since starting the habit was also assessed. Practices and knowledge about harmful effects were compared between "Daily users of Chaalia and Pan Masala" and "less than daily users of Chaalia and Pan Masala."

Data about the number of packets consumed daily was collected across a range of 'one per day' to 'more than five per day'. The place of procurement of these substances was also recorded in terms of proximity to school or home, along with reasons for starting the habit.

The SPSS software was used for data analysis. Mean and standard deviation was computed for age and frequencies and percentages for categorical variables like source of knowledge about harmful effect, type of harm including correct or incorrect responses. Practice of use of Chaalia and Pan Masala including frequency of use, source of money and reasons for use by the two groups. Frequencies of multiple response variables by the two groups were obtained.

Results

A total of 370 students were interviewed. Most 97.3% (95% C.I.: 95.6%, 98.9%) were Chaalia-Pan Masala users. Their ages ranged between 11-15 years with an overall mean age of 12.71 ± 1.27 years. Females were

44.6% (n=165) of the total sample. More than two thirds of the fathers and one third of the mothers had ever gone to school. Two hundred and sixty nine (72.7%) were "daily users", while the remaining students 91 (27.3%) were using the substances at a less than daily frequency. Of these periodic users, 62% (n=167) were boys. More than 80% in each group were using the substances in full knowledge of their family (Table-1). Two hundred and sixty-one (97%) of the "daily users" and 90% (n=82) of the "less than daily users" procured the substances themselves. The majority (88%) of both groups bought the substances from shops located near their homes while a little over 58% bought them from shops near their schools. Good taste 114 (88%), because of friends 202 (57%), because of family members 88 (25%), due to a craving for it 149 (42%), convenient availability 47 (13%) and low cost, 48 (13%) (Table-1) were the reasons for using the substances.

A large proportion (98%) of both "daily users" and

Table-1: Practices of use of Chaalia and Pan Masala products as reported by students in "daily" and "less than daily users."

Variable	Daily Number of subjects 269 (72.7%) n (%)	Less than daily use 91 (27.3%) n (%)	Total 360 n (%)
Use in full knowledge of family			
Yes	224(83.3)	80(87.9)	304(84.4)
No	38(14.1)	8(8.80)	46(12.8)
Do not know	7(2.6)	3(3.3)	10(2.8)
Purchase of substance/s him/herself			
Yes	263(97.8)	82(90.1)	345(90.8)
No	6(2.2)	9(9.9)	15(4.2)
*Proximity of place of procurement of substances			
Near Home	234(88.3)	77(88.5)	311(84.0)
Near school	168(63.4)	49(56.3)	217(58.6)
Inside School	21(7.9)	8(9.2)	29(7.8)
Far away	2(0.8)	1(1.1)	3(0.8)
Relative with a habit* including cigarette smoking			
At least one relative	236(87.7)	83(91.2)	319(88.6)
No one	33(12.3)	8(8.8)	41(11.4)
Use by teachers			
Yes	47(17.5)	28(30.8)	75(20.8)
No	215(79.9)	62(68.1)	277(77.0)
Did not specify	7 (2.6)	1(1.1)	8(2.2)
Use by friends			
Yes	264(98.1)	89(97.8)	353(98.1)
No	5(1.9)	2(2.2)	7(1.9)
Sharing the substances with friends			
Yes	238(88.5)	85(93.4)	323(89.7)
No	12(4.5)	3(3.3)	15(4.2)
Did not specify	19(7.0)	3(3.3)	22(6.1)
*Reasons for consuming these substances			
Taste	239(89.2)	75(89.3)	314(84.9)
Use by Friends	166(61.9)	36(42.9)	202(54.6)
Easy availability	140(52.2)	33(39.3)	173(46.8)
Craving	116(43.3)	33(39.3)	149(40.3)
Use by Family members	71(26.5)	15(17.9)	86(23.2)
Relieves hunger	36(13.4)	10(11.9)	46(12.4)
Low cost	33(12.3)	15(17.9)	48(13.0)

*multiple responses from some respondents

"less than daily users" of Chaalia believed that Chaalia consumption was harmful and 60% of both "user" groups were of the opinion that Pan Masala use was harmful for health. Self reported harmful effects in descending order of frequency caused by Chaalia and Pan Masala use ranged from stone formation (site not specified) 44% (n=161), cancer 37% (n=136), illness (unspecified) 26% (n=95), sore throat 25% (n=90), kidney pain 13.8% (n=51), respiratory problems 9% (n=32), accidental inhalation 6.8% (n=25), teeth problems 6% (n=22) each, cough 5.7% (n=21) and Oral Submucous Fibrosis (OSMF) 4% (n=13) each. Four percent did not know any harmful effects of the habits. (Table-2).

The types of harmful effects believed to be caused by the use of these substances were almost similar in the

Table-2: Knowledge of harmful effects of Chaalia and Pan Masala products in "daily users" and "less than daily users."

Variable	Daily 269 (72.7%) n (%)	Less than daily use 91 (27.3%) n (%)	Total 360 n (%)
Use of Chaalia harmful for health			
Yes	266(98.9)	89(97.8)	355(98.6)
No	3(1.1)	2(2.2)	5(1.4)
Use of Pan Masala harmful for health			
Yes	154(57.2)	61(67.0)	215(59.7)
No	102(37.9)	27(29.7)	129(35.8)
Do not know	13 (4.8)	3 (3.3)	16(4.4)
Friends believed that use of Chaalia and Pan Masala is harmful for health			
Yes	162(60.2)	56(61.5)	218(60.6)
No	99(36.8)	34(37.4)	133(36.9)
Do not know	8(3.0)	1(1.1)	9(2.5)
Most harmful substance for health			
Chaalia	20(7.4)	4(4.4)	24(6.7)
Pan Masala	4(1.5)	1(1.1)	5(1.4)
Tobacco	194(72)	61(67)	255(70.8)
Tobacco containing products	51(19)	25(27.5)	76(21.1)
*Harmful effects of the habit as reported by the students			
Stone formation	139(51.7)	41(45.1)	180(48.6)
Cancer	114(42.4)	44(48.4)	158(42.7)
Illness (unspecified)	79(29.4)	30(33.0)	109(29.5)
Sore throat	82(30.5)	25(27.5)	107(28.9)
Kidney pain	42(15.6)	9(9.90)	51(13.8)
Respiratory Disease	34(12.6)	13(14.3)	47(12.7)
Accidental inhalation	17(6.3)	8(8.8)	25(6.8)
Tooth problems	15(5.6)	5(5.5)	20(5.4)
Cough	12(4.5)	9(9.9)	21(5.7)
OSMF	10(3.7)	3(3.3)	13(3.5)
Source of knowledge of harmful effects			
Mother	180(67.4)	46(51.7)	226(61.1)
Father	156(58.4)	43(48.3)	199(53.8)
Other family members	60(22.5)	22(24.7)	82(22.2)
Television	53(19.9)	18(20.2)	71(19.2)
Teacher	48(18)	9(10.1)	57(15.4)
Somebody with harmful effect	30(11.2)	17(19.1)	47(12.7)
Did not specify	28(10.5)	13(14.6)	41(11.0)
Neighbour	22(8.2)	17(19.1)	39(10.5)
Doctor	27(10.1)	8(9.0)	35(9.5)
Newspaper	14(5.2)	3(3.4)	17(4.6)

*10 most frequently reported harmful effects.

two groups. Parents were the main source of knowledge about harmful effects of Chaalia and Pan Masala followed by relatives and media (Table-2).

Approximately 44% knew or knew about someone with a harmful effect caused by the habit yet 77.5% continued the habit. Parents were the most commonly reported people to advise against the habit (Table-3).

Table-3: Practices in relation to Knowledge as reported by respondents in “daily” and “less than daily users” of Chaalia and Pan-Masala.

Variable	Daily 269 (72.7%) n (%)	Less than daily use 91 (27.3%) n (%)	Total 360 n (%)
Worry following knowledge about harmful effects			
Yes	162(60.2)	56(61.5)	218(60.6)
No	106(39.4)	32(35.2)	138(38.3)
Do not know	1(0.4)	3(3.3)	4(1.1)
Wish to stop this habit following knowledge about harmful effects			
Yes	214(79.9)	66(72.5)	280(78.0)
No	54(20.1)	22(24.2)	76(21.2)
Do not know	0(0.0)	3(3.3)	3(0.8)
Knowledge about somebody who got a harmful effect from using these substances			
Yes	110(40.9)	48(52.7)	158(43.9)
No	159(59.1)	43(47.3)	202(56.1)
Action regarding habit after finding out about harmful effects			
Continued the habit	214(79.6)	65(71.4)	279(77.5)
Stopped habit	35(13)	17(18.7)	52(14.4)
Stopped and restarted habit	20(7.4)	9(9.9)	29(8.1)
*Reasons for stopping or restarting habit			
Difficult to stop	20(7.4)	12(13.2)	32(8.9)
Friends	11(4.1)	7(7.7)	18(5.0)
Enjoyable habit	46(17.1)	8(8.8)	54(15.0)
Do not know	157(58.4)	47(51.6)	204(56.7)
Harmful Habit	35(13)	17(18.7)	52(14.4)
Anyone advising to stop habit			
Yes	267(99.3)	88(96.7)	355(98.6)
No	2(0.7)	3(3.3)	5(1.4)
*Person advising to stop habit			
Parents	248(92.9)	81(92)	329(88.9)
Teachers	250(93.6)	77(87.5)	327(88.4)
Doctor	223(83.5)	71(80.7)	294(79.5)
Other family members	168(62.9)	57(64.8)	225(60.8)
Siblings	71(26.6)	33(37.5)	104(28.1)
Friends	73(27.3)	25(28.4)	98(26.5)
Dentist	25(9.4)	22(25.0)	47(12.7)
Doctor	27(10.1)	8(9.0)	35(9.5)
Others	7(2.6)	5(5.7)	12(3.2)
Do not know	0(0.0)	2(2.2)	2(0.5)

Discussion

The frequency of use of Chaalia in our study subjects was 94% and most of them were daily users. Similar results were obtained from a study in primary school children in Baba Island (74%), a fishing community of 7,000 individuals of Karachi and in Asian immigrant school students aged between 11 and 15 years in the United Kingdom (77%).^{2,4} In our study the parents belonged to a

low income group with lack of education and indulging in the habit of betel chewing. This proves that environmental influences play a major role in moulding practices as studies have found that about 50% of users started the habit with their families.^{2,4,10} Sweetened Chaalia was the most commonly used variety, similar to that found by Shah et al.² and this is the likely explanation for taste being the most frequently 84.9% reported reason for the habit in our study.

Majority of the students, 90.8%, were purchasing the substance themselves as were 94% in the study by Shah et al and this appears to be another major contributory factor for continued use in our study. The reason for such a high frequency in these areas is the easy availability and the fact that this habit is a socio-culturally accepted practice amongst Pakistani or Ex-Pakistani adults.^{2,4} In our study the low cost and hence within reach of the smallest amount of pocket money and easy accessibility are additional factors promoting continued use.

There was no parental or school/teacher supervision or sanctions on the buying of these substances although parental belief that the substances were harmful and advice against using the substances was reported by 98% in our study, and by over 50% in the study by Shah et al. It is alarming to note that even though most children reported that their parents considered the habit harmful and advised against it, they continued the habit for the good taste, due to peer pressure, family culture and a craving for it, besides the convenient availability and low cost. The fact that taste is reported as the most common reason for starting or continuing the habit indicates that the strongest compulsion for the habit is taste which is perhaps secondary to the fact that areca catechu is addictive. Correspondingly, 42% reported a craving for the substances as a reason for continuing the habit, implying that the habits of Chaalia and Pan Masala use are addictive.^{2,9} There is increasing evidence that areca products produce dependency.³ Furthermore, Areca catechu as a substance of abuse is included in the category of "substance induced disorders" in DSM IV.¹¹

Awareness about medically established harmful effects was present to a varying degree although many other unrelated diseases and conditions were also believed to be caused by these habits. The risk of OSMF is increased hundred folds in habitual users of areca nut as repeatedly shown in literature^{2-4,12,13} In users of Pan Masala/Gutka, it has been shown that OSMF develops after an average of 2.7 ± 0.6 years of use whereas in pan chewers it develop after 8.6 ± 2.3 years.^{5,10,14} Although Oral cancer and OSMF are well established hazards of this dangerous habit, only 4% of the respondents reported OSMF as a harmful effect as compared with 44% of the respondents who stated that stone formation (site not specified), is a harmful effect.¹⁵⁻²⁰

Incorrect harmful effects reported by the students included kidney pain, anaemia, tuberculosis, worms, AIDS, blood diseases, diabetes mellitus and appendicitis. This reveals the extent and range of erroneous knowledge regarding harmful effects of these habits.

The source of knowledge ranged from parents, teachers, television, newspapers, doctors and others. Although the large majority of the students reported that doctors advised against using these substances, few said that knowledge about harmful effects came from doctors. It appears that doctors are actively advising against the habit without educating/giving information to the patient or family, whereas parents are doing both, yet the students are continuing the habit. Although more than 70% wished to stop the habit following the acquisition of knowledge about harmful effects, almost the same number continued to use the substances and 56% could not give a reason for continuing the habit.

Steps need to be taken at the administrative level by creating awareness among the general public about the hazardous nature of these products by appropriate health messages in newspapers and the electronic-media and through passing legislation to ban the sale of Supari and Pan Masala to young children.¹⁹ Restriction of advertisements and sponsorship by the manufacturers of the various brands on television and video films would also prevent the promotion of these habits as harmless and desirable.

In addition, school health education programmes regarding these substances involving trained teachers and school doctors should be developed and incorporated into existing school curricula.

Dentists and Oto-Rhino-laryngologists see patients after the harm has been done and are well aware about the consequences of these habits. The family physician or general practitioner as the first contact doctor can be an effective instrument in decreasing the use of these harmful substances and in decreasing the high incidence of oral cancer in Pakistan.

Limitations:

The study sample was largely drawn from children coming from poor socio-economic backgrounds attending government schools in a low socio-economic area, so the results cannot be generalized to the whole population.

Conclusion

The frequency of use of Chaalia and Pan Masala is high in children of lower socio-economic areas. Although the majority of the children believed that the habits were

hazardous, they continued to use these substances for the taste, followed closely by the low cost and convenient availability. The habit amounts to paediatric substance abuse and is widespread across all socio-economic groups in Pakistan, particularly the lower socio-economic strata who constitute the large majority.

References

1. Boucher BJ, Mannan N. Metabolic effects of the consumption of Areca catechu. *Addict Biol* 2002; 7: 103-10.
2. Shah SM, Merchant AT, Luby SP, Chotani RA. Addicted schoolchildren: prevalence and characteristics of areca nut chewers among primary school children in Karachi, Pakistan. *J Pediatr Child Health* 2002; 38:507-10.
3. Winstock AR, Trivedy CR, Warnakulasuriya KAAS, Peters TJ. A dependency syndrome related to areca nut use: some medical and psychological aspects among areca nut users in the UK. *Addiction Biol* 2000; 5: 173-9.
4. Farrand P, Rowe RM, Johnston A, Murdoch H. Prevalence, age of onset and demographic relationships of different areca nut habits amongst children in Tower Hamlets, London. *Br Dent J* 2001; 190: 150-4.
5. Khadim MI. The effects of Pan and its ingredients on oral mucosa. *J Pak Med Assoc* 1977; 27: 353-6.
6. Bagchi M, Balmoori J, Bagchi D, Stohs SJ, Chakrabarti J, Das DK. Role of reactive oxygen species in the development of cytotoxicity with various forms of chewing tobacco and pan masala. *Toxicology* 2002; 179: 247-55.
7. Chaudhry K. Is pan masala containing tobacco carcinogenic? *Natl Med J India* 1999; 12: 21-7.
8. Merchant AT, Haider SM, Fikree FF. Increased severity of oral submucous fibrosis in young Pakistani men. *Br J Oral Maxillofac Surg* 1997; 35:284-7.
9. Maher R, Lee AJ, Warnakulasuriya KA, Lewis JA, Johnson NW. Role of areca nut in the causation of oral submucous fibrosis: a case-control study in Pakistan. *J Oral Pathol Med* 1994; 23:65-9.
10. Babu S, Sesikeran B, Bhat RV. Oral fibrosis among teenagers chewing tobacco, areca nut, and Pan masala. *Lancet* 1996; 348:692.
11. Substance related disorders. In Charles W Mitchell, editor. Kaplan and Sadock's *Synopsis of Psychiatry: behavioral sciences/Clinical psychiatry*. 8th ed. Maryland: Lippincott Williams and Wilkins 1998; pp 375-91.
12. Merchant A, Husain SS, Hosain M, Fikree FF, Pitiphat W, Siddiqui AR, et al. Paan without tobacco: an independent risk factor for oral cancer. *Int J Cancer* 2000; 86:128-31.
13. Lee CH, Ko YC, Huang HL, Chao YY, Tsai CC, Sheih TY, et al. The pre cancer risk of betel quid chewing, tobacco use and alcohol consumption in oral leukoplakia and oral submucous fibrosis in southern Taiwan. *Br J Cancer* 2003; 88: 366-72.
14. Tilakaratne WM, Klinikowski MF, Saku T, Peters TJ. Oral submucous fibrosis: review on aetiology and pathogenesis. *Oral Oncol* 2006; 42: 561-8.
15. Zain RB, Ikeda N, Gupta PC, Warnakulasuriya S, van Wyk CW, Shrestha P, et al. Oral mucosal lesions associated with betel quid, areca nut and tobacco chewing habits: consensus from a workshop held in Kuala Lumpur, Malaysia, November 25-27, 1996. *J Oral Pathol Med* 1999; 28: 1-4.
16. Khawaja MR, Mazahir MR, Majeed A, Malik F, Merchant KA, Maqsood M, et al. Chewing of betel, areca and tobacco: perceptions and knowledge regarding their role in head and neck cancers in an urban squatter settlement in Pakistan. *Asian Pac J cancer Prev* 2006; 7: 95-100.
17. Mazahir S, Malik R, Maqsood M, Merchant KA, Malik F, Majeed A, et al. Socio-demographic correlates of betel, areca and smokeless tobacco use as a high risk behavior for head and neck cancers in a squatter settlement of Karachi, Pakistan. *Subst Abuse Treat Prev Policy* 2006; 1:10.
18. Najeeb T. Clinicopathological presentation of tongue cancer and early cancer treatment. *J Coll Physicians Surg Pak* 2006; 16: 179-82.
19. Patel DR, Greydanus DE. Substance abuse: a pediatric concern. *Indian J Pediatr* 1999; 66: 557-67.
20. Warnakulasuriya S, Trivedy C, Peters TJ. Areca nut use: an independent risk factor for oral cancer. *BMJ* 2002; 324: 799-800.