

Areca Nut Consumption Patterns Among Primary School Children of Karachi

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ABSTRACT

Background: Areca nut is consumed extensively throughout the world with significant public health and oral implications. This study aimed at determining the prevalence and pattern of areca nut consumption in primary school children of Karachi city.

Methodology: A cross-sectional survey was conducted amongst schoolchildren (age = 6 to 12 years) of Karachi city employing two-stage sampling technique. Information regarding participants' demographics and areca nut chewing pattern were collected and recorded by a single trained examiner. SPSS 17 was used for descriptive and univariate logistic regression analysis.

Results: Results showed that out of the total [N= 600; male (52%), female (48%)] areca nut chewing was found more prevalent in males (64.6%) throughout the range of 6-12 years. Almost half of these children adapted this habit under peer influence (47%). Negative media influence [p-value <0.001, OR=28.981, CI=14.543-57.750] was identified as the most influencing factor for these children in taking up the habit of areca nut chewing. Other factors identified were low maternal education [p-value <0.001, OR=3.920, CI=1.731-8.875], poor awareness of the children [p-value <0.001, OR=2.414, CI=1.620-3.598], no restriction in school premises [p-value <0.006, OR=2.012, CI=1.224-3.310] and the sweet pleasant taste of areca nut [p-value <0.006, OR=1.97, CI=0.062-0.629].

Conclusion: Majority of primary school children are in the habit of regular use of areca nut which is known to have public health implications. Health policies targeted towards an increase in public awareness particularly for the high-risk groups such as the school children through educational means is urgently needed for control of this risky practice early in life.

Key words: areca nut, chewing patterns, schoolchildren.

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INTRODUCTION

Areca nut is consumed extensively throughout the world and public health implications of its chewing habit are significant where oral health is no exception. Not only oro-pharyngeal and esophageal cancers have largely been associated with areca nut chewing but also a number of systemic diseases such as diabetes mellitus, hypertension, cardiovascular diseases and systemic inflammations have been found to occur in connection with areca nut consumption.¹⁻⁵ According to epidemiological data, this habit is more prevalent

amid communities belonging to South-East Asia.⁶ However, it may become widespread in other parts of world as a result of expanded relocations of people from the Indian sub-continent.⁷ In past few decades, prevalence based surveys have reported that prevalence of consuming areca nut irrespective of tobacco additives (paan, paan masala, gutka) has reached 20 - 40% among 15-years and older population of South-East Asia.^{6,8}

Areca nut is predominantly chewed alone in younger age; however it may serve as an initiating habit progressively leading to tobacco, nicotine and alcohol consumption.⁹ This may be a reason why studies have shown more areca nut chewing preferences amongst smokers and alcohol consumers.^{10,11} Additionally, inclusion of tobacco with areca nut exacerbates health risks as compared to areca nut used alone, subsequently increasing the incidence of oral cancer by 123-folds amongst alcohol, betel quid and cigarette (ABC) consumers.¹¹

Unfortunately, not much awareness prevails concerning unfavorable outcomes of areca nut consumption⁹ and that too specifically in younger age school-going

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children. The plausible reason may be insignificant knowledge regarding epidemiology of areca nut chewing habits among this particular group. Taking the above in account, current study aimed at determining the epidemiology of areca nut consumption in primary school children of Karachi city including its prevalence, patterns and any associations found between the consumption patterns and socio-demographic factors.

METHODOLOGY

A cross-sectional survey was conducted over a period of four months (August 2012 - December 2012) in Karachi city. A two-stage sampling technique was employed where the sampling frame was the school children (both genders) ranging from grade-one to grade-six, attending subsidized government and private schools.

Karachi, a metropolitan city and an economic hub of Pakistan, consists of 18 towns. In first stage, nine out of these 18 towns were selected through simple random sampling. Later, from each of the nine towns, two schools (one each from subsidized public school and private) were selected on convenience basis after seeking formal permission to the school heads. In total 18 schools were managed to be included in the study. Information about the study and consent letters for parents and their child were sent through the school teachers and in second stage, through purposive sampling, students of both genders, enrolled in grades one-to-six from these selected schools (age= 6-12 years) were included in the study. Only those children whose parents consented to participate and accompany their child were included. Children un-accompanied by even their one parent were excluded from the study. Information regarding participants' demography such as parental socio-economic status (SES) and educational level was collected by the child parent(s). Socio economic level was assessed and classified as Low, Middle and High SES on the basis of area of residence, monthly income, occupation of the family earner(s), type of house, means of transportation and number of house hold electrical appliances. All variables were based on as presented by Durkin and Islam et al.¹² On the other hand, information regarding areca nut chewing habit and patterns were assessed through a questionnaire. Each child was asked, in native language, a combination of structured 27 open-ended and close-ended type questions by a single trained Examiner. The questions were adapted from a study conducted previously on Bangladeshi population¹³ that explored the participants' areca nut chewing habits, forms in which they use areca nut, frequency, duration, sources and reasons of obtaining areca nut and their awareness towards its harmful effects. All these information and responses were assessed and recorded by a single examiner.

Statistical Package of Social Sciences (SPSS) version 17 was used for data entry and analysis. Descriptive analysis was performed to determine means, frequencies and percentages of study variables. Univariate Logistic Regression was performed to determine associations between areca nut consumption (independent) and dependent variables, namely, demographic factors and their chewing patterns. Significance level was preset at p-value <0.05.

RESULTS

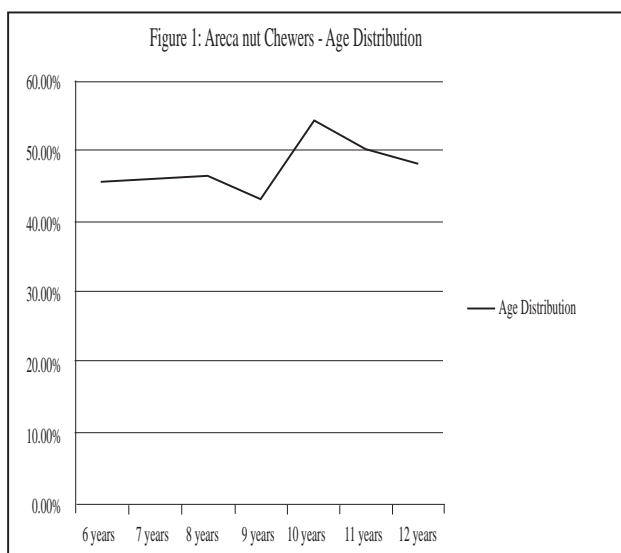
Out of total 650 schoolchildren 600 children participated in this study giving a response rate of 92%. Gender and age distribution was almost equally distributed amongst the total sample where (52% were boys and 48% were girls) with a Mean age of 8.78 ± 0.80 years (age range = 6-12 years). The participants were found evenly distributed in terms of SES with 50% belonging to Middle and 50% to Low SES. None with High SES was found.

According to this study, overall 48.5% schoolchildren consumed areca nut irrespective of the form with males (64.6%) outnumbering females (35.3%). Fifty-four percent children belonging to low socio-economic strata habitually consumed areca nut while amongst middle socio-economic strata the prevalence of this habit was 45.7%. In terms of frequency of consumption, 47% of areca nut chewers consumed it on daily basis whereas rest of the participants consumed occasionally. A momentous consistency was observed in relation to age of the children, that is, habit of chewing areca nut was found to be prevalent throughout the range of 6-12 years with a slightly higher prevalence in the 10-year age children (see Figure 1).

Regarding the forms of areca nut, amongst total areca nut chewers, 51.5% consumed it in sweetened form, 28.1% in combination with paan masala, 12.3% consumed areca nut in raw dried form, while 6.8% consumed in combination with betel quid and 1.3% mixed with gutka. The reasons reported by the participants for consuming areca nut were: 70.4% due to its pleasant taste, 17.7% were influenced by advertisement, 10.8% felt mature among peers while 1.1% reported it as a stress reliever. As for the acquisition of this habit, 46.6% responded that they adapted this habit under peer pressure, 34.3% adapted from their family members, and 19.1% acquired it under the influence of media. In terms of outlets from where areca nut is purchased, 69.9% procured it from general stores located in their residential vicinities, 18.2% from road-side tobacco vendors, 6.5% from school canteens, while 5.4% obtained this product from friends. An additional but very important finding reported by 16 out of 18 school administrations was

Table 1: Socio-demographic distribution of study participants and associations with areca nut consumption:

Areca nut Chewing Variables	Present (n= 291)	Absent (n= 309)	p-value	Odds Ratio	95% Confidence Interval
Gender:					
Male	64	124	reference	reference	reference
Female	227	185	0.058	1.195	(-0.023)-0.231
SES Condition:					
Low SES	158	142	reference	reference	reference
Middle SES	133	167	0.846	1.190	(-0.014)-0.202
Father's Educational Status:					
Primary	24	8	reference	reference	reference
Secondary	60	93	<0.001	3.920	1.731-8.875
Intermediate	108	89	0.073	2.072	0.933-4.598
Graduate	99	119	0.010	2.832	1.279-6.269
Mother's Educational Status:					
Primary	73	37	reference	reference	reference
Secondary	97	111	<0.001	0.396	0.243-0.645
Intermediate	92	105	0.010	0.517	0.313-0.855
Graduate	31	54	0.069	0.548	0.287-1.047



that they had restrictions on selling areca nut containing products in their school premises.

To establish associations between areca nut consumption (independent variable) and dependent variables, univariate logistic regression analysis using forward step-wise method was performed. Detailed description regarding demographic associations of study participants with their respective areca nut consumption are described in Table 1 and Figure 1.

A significant association [p-value <0.006, OR=1.97, CI=0.062-0.629] was established between the sweetened form of areca nut and respective consumption indicating that children prefer flavored areca nut readily available in packed sachets instead of unsweetened form. Similar significant relationship was developed between areca <0.001, OR=4.008, CI=2.154-7.460] as well as gutka

nut usage and consumption of paan masala [p-value [p-value <0.001, OR=88.389, CI=28.400-275.096].

Children who were not aware of the harmful effects of areca nut consumption were 2.5 times more likely to adapt this habit of using areca nut [p-value <0.001, OR=2.414, CI=1.620-3.598] while children enrolled in schools which have imposed restrictions on selling and consuming areca nut products in their premises are twice less likely to acquire this harmful habit [p-value <0.006, OR=2.012, CI=1.224-3.310] in comparison to children studying in schools which do not have such restrictions. A significant association [p-value <0.001, OR=28.981, CI=14.543-57.750] was also established between consumption of areca nut and influence of display and advertisement in persuading children to adapt such habit of using areca nut.

DISCUSSION

Based on evidences showing strong dose-response relationship for frequency and duration of areca nut, the World Health Organization (WHO) and International Agency for Research on Cancer has classified areca nut as Group-I carcinogen for causing pre-cancerous and cancerous conditions pertinently in oral cavity.¹⁴ Areca nut chewing habit is widespread in South East Asian and Pacific Island Regions where a high prevalence of areca nut consumption has been reported.¹⁵ Additionally, according to this global epidemiology the overall prevalence of areca nut consumption is rising in India and Taiwan. Although this habit is equally distributed among all population age groups, a generally higher proportion of school going children are observed of consuming areca nut on daily basis in one or the other form. A recent study

from India has reported that 27% of school children habitually consume areca nut,¹⁶ unlike the present study results where almost half of the similar age group consumes this harmful product. On the other hand, high-school children from Micronesia are still considered having the highest prevalence (63 %) of consuming areca nut.¹⁷

It is observed that frequency of areca nut chewing increases with age and an increased consumption is seen amongst males than females showing obvious gender specificity.¹⁸ While there was no significant over representation of any gender in the total sample of our study, the results are in accordance with the previous observation.¹⁸ So far to our knowledge only one study¹⁹ is available that observed more females consuming areca nut than males. However, our study results did not concur to these findings probably because their study subjects suffered from psychiatric disorders and it is a known fact that any kind of substance abuse is majorly linked to stress and psychiatric problems.²⁰ Moreover, in relation to the socio-economic status and areca nut consumption habit, earlier studies^{16,19} have suggested that prevalence of this habit is existent amongst children belonging to low SES. However, in present study no significant association could be ascertained probably because our study sample comprised mainly of middle to low socio-economic status children. In current study, parental education had a significant influence on children' habit of chewing areca nut since low education is closely related to poor awareness and illiteracy concerning harmful effects of areca nut. This finding is in accordance to previous studies²¹⁻²³ in which a strong correlation between children' areca nut consumption and low parental education was clearly evident.

Considering that the value of any commodity can be enhanced by changing the form of the product and packing in small sachets. Similarly, value of areca nut may also be enhanced by selling it in scented and sweetened form in small packets and this is evident through current study results where more than 50% of total areca nut consumers were using areca nut in commercially available sweetened form. Another study carried out in Karachi representing children of fishermen showed similar results where all children were consuming areca nut in sweetened packet form.²²

Evidently, a significant association was established between sweetened areca nut and prevalence of chewing habit in the present study. The above statistics supports the notion that sweetened form of areca nut is a preferred choice among children of chosen age and this finding is supported by another study¹⁶ which reported that sweetened areca nut is becoming increasingly popular among school going children.^{16,24} A significant association of areca nut consumption with usage of

paan and gutka was also observed which may highlight the idea that children who start consuming areca nut gradually progress towards adapting the habit of paan and gutka as their severity of addiction increases with these products.

According to the results of our study, majority of children consumed areca nut primarily due to its pleasant sweet taste and this is in accordance to a local study by Shah S et al,²⁴ which reported that most common reason for using areca nut amongst schoolchildren was its good taste. These findings further reinforce the fact that sweetened flavor is prime cause behind consuming areca nut becoming common amongst young children population. An additional reason highlighted by current study was the revelation by study participants regarding influence of open advertisement on the psyche of young children by promoting areca nut products packed in attractive sachets with sweetened additives.

As for the acquisition of areca nut chewing habit, almost half of the participants reported that they adopted this habit under peer influence. A similar pattern was also observed in an earlier study²⁴ conducted on the same age group children only in Mahmoodabad and Chanesar Goth localities of Karachi. It is noteworthy that school children from these same two localities were also included in our study. Therefore, similar results observed may be subsequent to our expectations. However, the plausible explanation regarding this observation would be that during childhood, lifestyle of children is in a developing phase and during school hours they are in constant contact with their peers. Hence, children are most prone to acquire addictive habits if their peers are involved in such harmful behaviors and this would ultimately lead to lifetime practices of areca nut as well as tobacco abuse. Influence of parents in adoption of this habit amongst children was also reported to be significant although at a lesser percentage, but in other studies it is quite evident that familial areca nut habit has a significant impact on children' behavior and areca nut consumption practices.¹⁶

It is very crucial to understand the dynamics related to the development of this habit. Most significant factors that cause or influence this habit as shown by study results are the psycho-social factors. These include sweetened and pleasant taste of areca nut which is mostly preferred by children of this age group. Moreover, the significant peer influence, the lack of parental education and most importantly the easy and unrestricted availability of this substance in residential vicinities make young children descend into this habit.

As long as such habits do not become a norm in a culture, it is not a tougher mission for public health authorities to curtail it. Therefore, it is necessary to deal directly with the concerned issue and immediate

concrete steps should be taken to pertinently cease areca nut consumption practices amongst our children. In this case, addressing the prime issue and related social factors may be the best route to a solution. Health policies targeted towards an increase in public awareness particularly for the high-risk groups through educational means is urgently needed so that the prevalence of this risky practice could be reduced. Factors which persuade children to quit areca nut habit should also be further investigated through qualitative research to promote better understanding and the derived information should be incorporated in health promotion programs to encourage them to quit.

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REFERENCES

- 1 Javed F, Al-Hezaimi K, Warnakulasuriya S. Areca-nut chewing habit is a significant risk factor for metabolic syndrome: a systematic review. 2012; 16:445-8.
- 2 Heck JE, Marcotte EL, Argos M, Parvez F, Ahmed A, Islam T, et al. Betel quid chewing in rural Bangladesh: prevalence, predictors and relationship to blood pressure. *Int J Epidemiol* 2012; 41:462-71.
- 3 Tsai WC, Wu MT, Wang GJ, Lee KT, Lee CH, Lu YH et al. Chewing areca nut increases the risk of coronary artery disease in Taiwanese men: a case-control study. 2012; 7:162-8.
- 4 Muttagi SS, Chaturvedi P, Gaikwad R, Singh B, Pawar P. *Ind J Med and Paed Oncol* 2012; 33:32-5.
- 5 Shafique K, Mirza SS, Vart P, Memon AR, Arain MI, Tareen MF, et al. Areca nut chewing and systemic inflammation: evidence of a common pathway for systemic diseases. 2012; 9:22-9.
- 6 Gupta PC, Ray CS. Epidemiology of Betel quid usage. *Annals Academy of Medicine Singapore* 2004; 33:31-6.
- 7 Warnakulasuriya S. Areca nut use following migration and its consequences. *Addiction Biology* 2002; 7:127-32.
- 8 International Agency for Research on Cancer: IARC Monographs on Betel quid and Areca-nut chewing. International Agency for Research on Cancer: Lyon. 1984; 41-80.
- 9 Gunaseelan R, Sankaralingam S, Ramesh S, Datta M. Arecanut use among rural residents of Sriperambudur Taluk: a qualitative study search 2007; 18:11-4.
- 10 Ko YC, Chiang TA, Chang SJ, Hsieh SF. Prevalence of betel quid chewing habit in Taiwan and related socio-demographic factors. *J Oral Pathol and Med* 1992; 21: 261-4.
- 11 Guo SE, Huang TJ, Huang JC, Lin MS, Hong RM, Chang CH, et al. Alcohol, betel-nut and cigarette consumption are negatively associated with health promoting behaviors in Taiwan: A cross-sectional study. *BMC Public Health* 2013;13:257.
- 12 Prabhu NT, Warnakulasuriya K, Gelbier S, Robinson PG. Betel quid chewing among Bangladeshi adolescents living in East London. *Int J Paed Dentistry* 2001; 11: 18-24.
- 13 Pankaj C. Areca nut or betel nut control is mandatory if India wants to reduce the burden of cancer especially cancer of the oral cavity. *Int J Head and Neck Surgery* 2010; 1:17-20.
- 14 Gupta PC, Wamakulasuriya S. Global epidemiology of areca nut usage. *Addiction Biology* 2002; 7:77-83.
- 15 Khandelwal A, Khandelwal V, Saha MK, Khandelwal S, Prasad S, Saha SG. Prevalence of areca nut chewing in the middle school going children of Indore, India. *Contemporary Clinical Dentistry* 2012; 3:155-7.
- 16 Oakley E, Demaine L, Wamakulasuriya S. Areca (betel) nut chewing habit among high-school children in the Commonwealth of the Northern Mariana Islands (Micronesia). *Bulletin of the World Oral Health Organization* 2005; 83:656-60.
- 17 Pobutsky AM, Neri EI. Betelnut chewing in Hawai'i: Is it becoming a public health problem? Historical and socio-cultural considerations. *Hawai'i J Med and Public Health* 2012; 71:23-6.
- 18 Velayudhan A, Kumar S, Benegal V. Betel Nut: A socially sanctioned drug of abuse. [http://www.hawaii.edu/hivandaids/Betel Nut A Socially Sanctioned Drug of Abuse.pdf](http://www.hawaii.edu/hivandaids/Betel%20Nut%20A%20Socially%20Sanctioned%20Drug%20of%20Abuse.pdf). Accessed 5th May 2013.
- 19 Buijnzeel AW. Tobacco addiction and the dysregulation of brain stress systems. *Neuroscience and Bio behavioural Reviews* 2012; 36:1418-41.
- 20 Ho CS, Gee MJ. The parental influence of betel-chewing behavior among junior high school students in Taiwan. *Substance Abuse* 2002; 23:183-9.
- 21 Shah MA, Marchant AT, Luby SP, Chotani RA. Addicted schoolchildren: Prevalence and characteristics of areca nut chewers among primary school children in Karachi, Pakistan. *J Paed and Child Health* 2002; 38:507-10.
- 22 Rozi S, Akhtar S. Prevalence and predictors of smokeless tobacco use among high school males in Karachi, Pakistan. *La Revue de Sante de la Mediterranee orientale* 2007; 13:916-24.
- 23 Shah S, Qureshi R, Azam I. Practices and knowledge of school children regarding chaalia/ paan masala in Mehmoodabad and Chanesar Goth, Karachi. *J Pak Med Assoc* 2008; 58:678-83.

