

# Prevalence of areca nut chewing in the middle school-going children of Indore, India

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## Abstract

**Objectives:** To assess areca nut chewing habit among middle school-aged children in Indore, India. Areca nut is chewed by itself, and in various scented preparations. It is associated with carcinogenesis, foreign body aspiration in children, and oral submucous fibrosis and may aggravate asthma. **Materials and Methods:** A retrospective collection of data to evaluate the prevalence of areca nut chewing among 3896 children was done. A simple random sampling was done. Children of both sexes were included in this study. **Results:** 27.06% of the school-going children (1054/3896) had areca nut chewing habit. More boys chewed areca nut than girls (2:1). 45.42% of school going children of rural area pander to areca nut chewing habit, whereas in urban area 20.09% children are indulged. Government school children are more involved in areca nut chewing habit. 81.02% of the children used sweetened and flavoured form of areca nut. The majority of the users were not aware of harmful effects that the use of areca nut might be harmful for health **Conclusion:** To diminish the use of areca nut, the Indian Government should consider limiting trade, advertising, and actively communicating its health risks to the public and should deem heavy taxes on it.

**Keywords:** Areca nut, prevalence, school-going children

## Introduction

Areca nut chewing habit is common in India. Areca nut is the fourth most commonly used social drug, ranking after nicotine, ethanol, and caffeine.<sup>[1]</sup> It is chewed by itself, in various scented preparations and in betel quid in various parts of India.<sup>[2]</sup> Commercially, areca nut is marketed in the form of sweetened areca nut (locally known as sweet supari) to target young children. A high proportion of school children used areca nut daily in some form. We conducted this study to assess the prevalence of areca nut use, in middle school-going children of Indore, India.

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## Materials and Methods


A retrospective collection of data was done to evaluate the prevalence of mesiodens conducted, for which the study was carried out on 3896 middle school-going children aged 8–17 years in Indore. A simple random sampling was done; school-going children belonging to different zones of Indore were randomly selected. Children of both sexes were included in the study.

Prior to the study, a letter of permission to examine the school children was given to the concerned head of the schools and the permission was obtained. A letter of information to the parents regarding the examination was sent through the concerned class teachers.

## Result

Out of 3896 children surveyed, 2147 were boys and 1749 were girls. 1054 children had areca nut with the mean prevalence of 27.06%. Out of total children who had chewing habit, 743 were boys and 311 were girls. It was observed that the prevalence of areca nut chewing is more in boys than in girls with a ratio of 2:1. The overall prevalence of areca nut among the boys was 34.6%, whereas the overall prevalence among the girls was 17.8% [Table 1].

45.42% of school-going children of rural area pander to areca nut chewing habit, whereas in urban area 20.09% children are indulged. Government school children are more involved in areca nut chewing habit [Table 2]. Most of the children are non-regular users [Table 3]. 854 (81.02%) out of 1054 use sweetened areca nut; only 36 used children used unsweetened betel nut alone and most striking was 146 used

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**Table 1: Age and prevalence of areca nut chewing among school students**

Children screened (N = 3896)	Boys (n = 2147)	Girls (n = 1749)
Habit present (n = 1054)	743	311
Percentage mean = 27.06%	34.6%	17.8%

**Table 3: Frequency of use among current users**

Total cases observed	Gender	
	Boys	Girls
Regular user	246	86
Non-regular user	514	208

**Table 5: From whom school children learned to use areca nut**

Habit acquired	%
Themselves	124 (11.76)
Friends	582 (55.21)
Siblings	216 (20.50)
Parents	49 (4.64)
Relatives	83 (7.87)
Other	-

pan masala [Table 4]. Most of the children used one packet of areca nut per day. "Chanchal" and "Ritik gold" are the common local brand and favorite brand of sweetened and flavored areca nut among the children.

More than half of the users of areca nut reported learning the habit from their friends or siblings [Table 5]. The majority of the users (742; 70.4%) were not aware of harmful effects that the use of areca nut might be harmful for health but few were aware that it may cause cancer or reduced mouth opening [Table 6].

## Discussion

Areca nut is an important agricultural product in many regions of the world, which is believed to be native to Sri Lanka, West Malaysia, and Melanesia.<sup>[3]</sup> In India, production of the nut has risen nearly threefold and may reflect the commercialization of areca products since the early 1980s. In 2001, production of areca nut in India was around 330,000 millions of tonnes.<sup>[4]</sup>

Areca nut is known as "supari" in India. It is the basic ingredient of a variety of widely used chewed products. Areca nut products are easily available even in the small shops. It plays an integral part of religious, social, and cultural functions. Areca nut is a psychoactive substance used by several hundred million persons worldwide, predominantly in southern Asia.<sup>[5]</sup> Areca nut is available in processed and unprocessed forms.

**Table 2: School and distribution of school with areca nut chewing habit**

School (%)	Classes	Areca nut (%)
Urban (20.09)	Government (1590)	296 (18.61)
	Private (1236)	272 (22)
Rural (45.42)	Government (494)	299 (28.36)
	Private (576)	187 (17.74)

**Table 4: Form of areca nut variety chewed**

Form of areca nut	%
Unsweetened areca nut	36 (3.41)
Sweetened areca nut only	854 (81.02)
Areca nut and beetle quid	18 (1.70)
Pan masala	146 (13.85)

**Table 6: Health hazards awareness among those who chew areca nut**

Hazard awareness	%
Harmless	201 (19.08)
Don't know	742 (70.4)
Oral submucous fibrosis	22 (2.08)
Cancer	89 (8.45)
Others	-

The major chemical constituents of the nut are carbohydrates, fats, proteins, crude fiber, polyphenols, alkaloids, and mineral matter.<sup>[6]</sup> Polyphenols (flavonols, tannins) constitute a large proportion of the dry weight of the nut. Polyphenols are responsible for the astringent taste of the nut. The nut has been shown to contain at least six related alkaloids, of which four (arecoline, arecaidine, guvacine, and guvacoline) have been conclusively identified in biochemical studies.<sup>[7]</sup> Arecoline is generally the main alkaloid, which is carcinogenic.<sup>[8]</sup> Application of these substances to human fibroblasts induces fibroblast proliferation and collagen production.<sup>[9,10]</sup> Areca nut chewing is strongly associated with oral submucous fibrosis, a crippling and precancerous condition.<sup>[11-13]</sup> Areca nut is implicated in causing oral cancer.<sup>[14,15]</sup> It has been found to be a common cause of airway obstruction in children leading to emergency admissions with potential fatal complications.<sup>[16]</sup> Areca nut chewing causes broncho-constriction and may aggravate asthma.<sup>[17]</sup> Complications of areca nut also include gingivitis, leukoplakia, and staining of teeth and gums.<sup>[18]</sup> Studies have shown that areca nut chewing is an addictive practice, much like the use of nicotine.<sup>[19]</sup> The euphoric effects of areca nuts are due to its alkaloid contents such as arecoline, a cholinergic agent and central nervous system stimulant that increases the amount of acetylcholine in the brain, and arecaidine, a hydrolyzed product of arecoline.<sup>[20]</sup>

Several small surveys conducted in schools and colleges in several states of India have reported that 13–50% of students chew pan masala and gutka<sup>[21]</sup>; we also found similar array in

our study, and the mean prevalence for areca nut chewing among school-going children was found to be 27.06%. More boys chewed areca nut than girls (2:1). 45.42% of school-going children of rural area pander to areca nut chewing habit, whereas in urban area 20.09% children are indulged. Government school children are more involved in areca nut chewing habit. 81.02% of the children used sweetened and flavored form of areca nut. The majority of the users (742) were not aware of harmful effects that the use of areca nut might be harmful for health.<sup>[22]</sup>

## Conclusion

Areca nut use is common among school children in India. Areca nut use by the parents or friends, lack of knowledge on the harmful effects of areca nut products, and elders being indifferent toward this habit affects the younger generation's perception toward high-risk behavior. Areca nut, like cigarettes, is addictive and dangerous. Areca nut use has the potential to cause immense harm to health. Unless effective health actions are undertaken, and known addictive nature, children may carry this insidious habit into adulthood and conceivably to adopt other addictive habits including tobacco use and cigarette smoking.

To diminish the use of areca nut, the Indian Government should consider restraining the trade, advertisements, and should deem heavy taxes on it which would raise its price. Actively communicating its health risks to the public, strategy involving parents, teachers, and local communities could be initiated to discourage areca nut use.

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