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Original Research Article

Knowledge, attitude, and practices of chewing areca nut among rural based community of Kadapa district, Andhra Pradesh: a cross-sectional study

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ABSTRACT

Background: Chewing areca (betel) nut ranks among the top five traditional oral habits worldwide. It contains several alkaloids from the pyridine group, with arecoline being the most significant. Nitrosated derivatives of arecal alkaloids are linked to cancer risk. Globally, it is the fourth most prevalent psychoactive substance and is classified as a group-1 carcinogen. Objectives were to assess the knowledge, attitudes, and practices related to betel nut chewing among residents in and around Putlampalli village in the Kadapa district.
Methods: A questionnaire, developed by Khan et al along with informed consent, was used as the instrument. A cross-sectional study was conducted with 285 participants, featuring 28 questions to investigate the knowledge, attitudes, and practices of betel nut chewing in the rural areas of the Kadapa district.
Results: Among the 285 participants, 84.9% were females. The 26% believed that chewing betel nut is not harmful to health, while 30% acknowledged that it can cause throat cancer. Additionally, 17% did not consider betel nut chewing addictive, 71% were willing to quit the habit, whereas 29% were not. Furthermore, 63% reported using betel nut once every four weeks, and 3% chewed it daily. A significant 70% learned to chew betel nut from family members, while 20.7% and 2.1% learned from advertisements and tradition, respectively.
Conclusions: A higher percentage of women consume betel nut compared to men. Most individuals learn the habit from family members. The risk of oral cancer increases when the quid contains tobacco. Periodic screening and awareness programs are recommended.

Keywords: Arecanut, Women, Knowledge, Attitude

INTRODUCTION

Chewing areca (betel) nut is one of the top five traditional oral habits worldwide. This practice is widespread in countries such as Taiwan, Sri Lanka, India, and other parts of Southeast Asia.[1,2] Typically, betel nut are consumed raw with betel leaves, sometimes accompanied by slaked lime. Beyond its religious significance, many in South Asia consider the areca nut an astringent, post-meal mouth freshener, flavor enhancer, purgative, intoxicant, and remedy for indigestion, impotence, gynecological issues, parasitic intestinal infections, and morning sickness during pregnancy.[3] Often chewed in a betel quid, the areca nut serves as a mild euphoric stimulant because of its high content of psychoactive alkaloids. Chewing boosts work capacity, induces a warming sensation in the

body, and increases alertness. Additionally, it is used by the economically disadvantaged to stave off boredom and suppress hunger.[3-5]

On a worldwide scale, arecanut ranks as the fourth most commonly used psychoactive substance.[6] The International Agency for Research on Cancer has categorized betel quid as a group-1 carcinogen.[7,8] In Asian populations, a meta-analysis of 12 case-control studies found that areca nut chewing was independently linked to an increased risk of esophageal squamous cell carcinoma.[9]

Betel quid, in its simplest form, consists of a mixture of betel leaf, areca nut, and slaked lime, which is a paste made from aqueous $Ca(OH)_2$. This combination has both relaxing and stimulating effects by influencing the body's autonomic nervous system. Areca nut contains several alkaloids from the pyridine group, with arecoline being the most significant.[10] Nitrosated derivatives of these areca alkaloids have been linked to a heightened risk of cancer.[11] In the 1960s, surveys conducted door-to-door in India, involving over 50,000 individuals aged 15 and above, revealed that the prevalence of betel quid use among males and females in five districts across four states Andhrapradesh, Bihar, Gujarat, and Kerala ranged from 3.3% to 37%.[12] In Andhra Pradesh, the prevalence of areca nut chewing was 2.3% with tobacco and 0.5% without tobacco, based on a sample size of 10,1699. According to the global adult tobacco survey (GATS) conducted in 2016-17, the overall prevalence of smoking tobacco use in India is 10.38%, whereas of that smokeless tobacco use is 21.38%. Among all adults, 28.6% currently use tobacco in either smoked or smokeless forms, including 42.4% of men and 14.2% of women.[13]

Although it has psychoactive properties and cultural importance, this practice poses significant health risks to the users. In Andhra Pradesh and other regions of India, initiatives are underway to investigate and tackle this problem, especially in rural areas such as the Kadapa district. This study focused on understanding the prevalence, knowledge, attitudes, and practices associated with areca nut chewing. This study specifically examined the knowledge, attitudes, and practices regarding areca nut chewing among residents of rural areas of the Kadapa district. Since no prior studies have been conducted on areca nut chewing in Kadapa, this research could serve as a crucial step towards prevention and raising awareness about the practice.

METHODS

Type of study

Study is a cross-sectional study.

Study period

Study conducted from January to May 2025.

Procedure for data collection

A total of 285 participants were selected among patients visiting the dental institute in the rural areas in and around Kadapa district. Individuals with a history of chewing betel nut, regardless of race, sex, education, occupation, or marital status, were selected. A convenient sampling technique was employed to individuals attending a dental hospital with a history of betel nut chewing. Written informed consent was taken from participants who were willing to participate in the study.

Inclusion criteria

Individuals who were chronic arecanut chewers, individuals >20 years of age and participants with proper informed consent were included.

Exclusion criteria

Mentally retarded individuals, individuals who are unable to communicate with the investigator and individuals having hearing difficulties were excluded.

Instrument

A questionnaire, accompanied by informed consent, was used as a tool, as described by Khan et al.[14] The study recorded demographic details such as age, gender, communication address, education, occupation, and income using a total of 28 questions to investigate the knowledge, attitudes, and practices related to chewing betel nut. Participants were assured that their information would remain confidential and would be used solely for research purposes. The questionnaire, originally in English from Khan et al study, was explained to the participants in Telugu. The questionnaire was divided into three sections: knowledge, attitudes, and practices related to betel nut chewing. The knowledge section covers potential harmful effects, such as oral cancer, throat cancer, oral diseases, miscarriage, kidney damage, and effects on the central nervous system.

The attitude section addressed the participants' views on quitting betel nut. The practice section included the frequency and duration of betel nut chewing. After completing the questionnaire, the participants were informed about the consequences and adverse effects of chewing Betel nuts. All collected data were entered into Microsoft excel.

Statistical analysis

Data were analyzed using the statistical package for the social sciences (SPSS) version 22 software (Armonk, NY, USA).

Statistical significance was set at $p<0.05$. Continuous variables are expressed as mean and SD, and descriptive statistics were applied to the data.

Ethical consideration

Ethical approval was obtained (IEC 014/IEC/GDCH/2024-25/90. Written informed consent was obtained, and participants who agreed to participate completed the questionnaire.

Informed consent

Consent was obtained through signatures from literate participants and thumb impressions from illiterate participants.

RESULTS

Table 1 represents the age and gender distribution of participants. The 84.9% are females and only 15.1% are males. Descriptive statistics among the individuals who participated in the study are represented in Table 2. The 41% don't know the dangerous health risks of chewing arecanut. 52% don't know that chewing betelnut causes throat cancer 57% reported increased work capacity on chewing betelnut (Table 3). In participants' attitudes towards betel nut usage, the majority acknowledged the addictive nature of betel nut chewing (83%). The 17% did not find chewing betel nut addictive, 71% expressed willingness to quit habit, whereas 29% weren't willing to quit the habit (Figure 1). The practice of betel nut among the participants represents 63% reported using betel nut once every four weeks, and 3% chewed betel nut every day (Figure 2). Of those who consume betel nut, the age of onset of chewing, 59% falls within 21-40 age range, 19% between 10-20 years, and <10 years for 9% (Figure 3). A striking 96% use between 1 to 5 packets daily, and 3% consumed around 6-10 packets daily. (Figure 4). Regarding the duration of their betel nut usage, 69% had a habit >10 years,1% had been chewing for less than a year, 11% (7-10 years), 10% (3-6 years), 9% (1-2 years), respectively (Figure 5). The 70% of the individuals learn to chew betelnut from family members, 21% and 2.1% from advertisements and tradition respectively (Figure 6). Regarding the duration of placing betel quid in the mouth, 53.7% practice for more than 5 minutes, 26.3% practice 2-5 mins respectively. The 98.2% swallowed quid after chewing. In form of consumption, 59.6% chew betel quid with tobacco, 15.4% chew betel quid without tobacco.

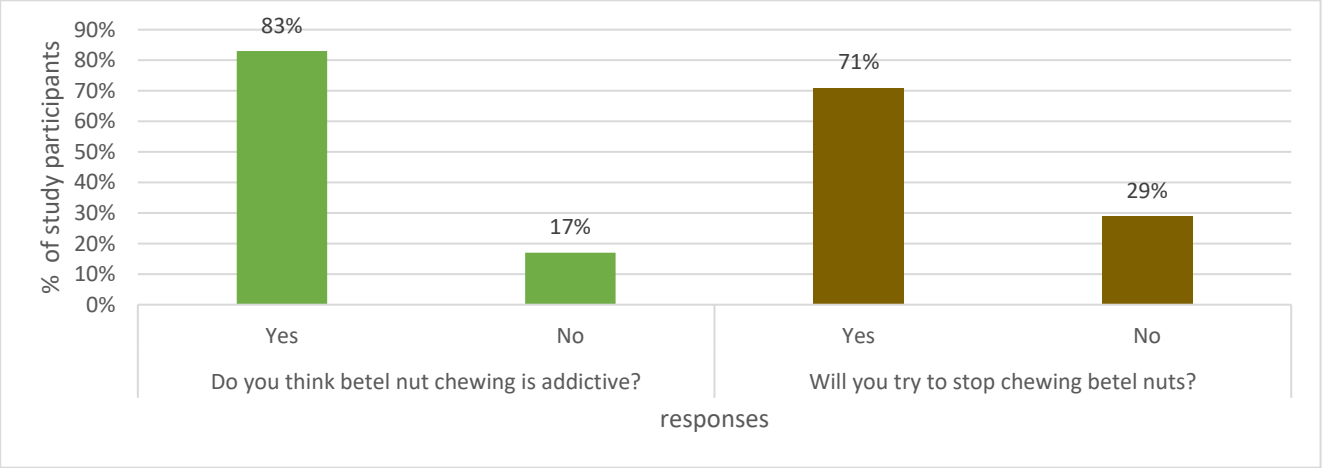

Figure 1: Illustration of betel nut addiction and cessation of habit.

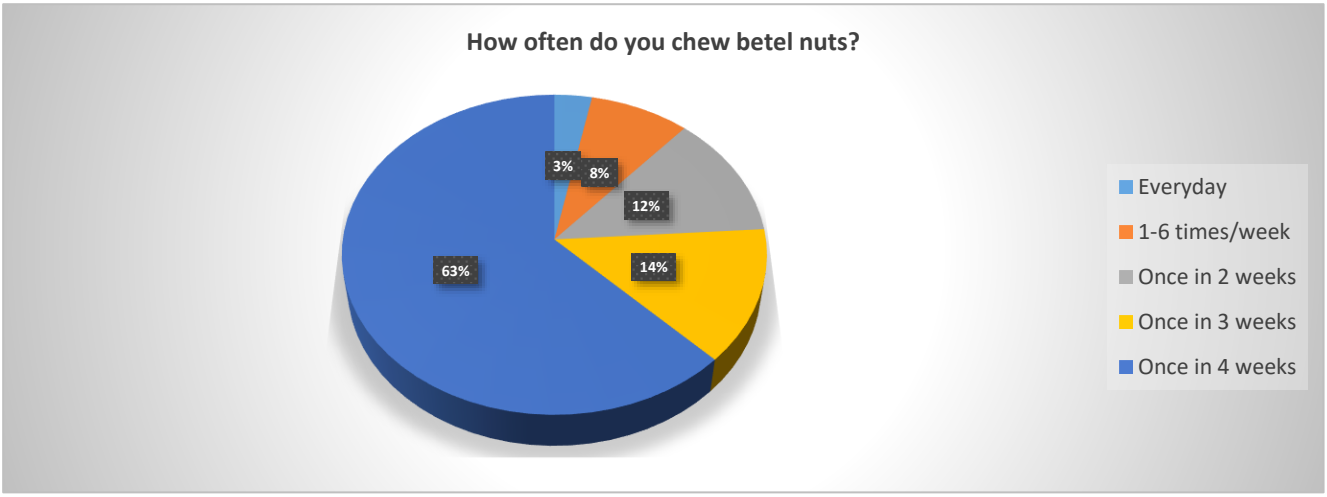

Figure 2: Illustration of frequency of betel nut chewing.

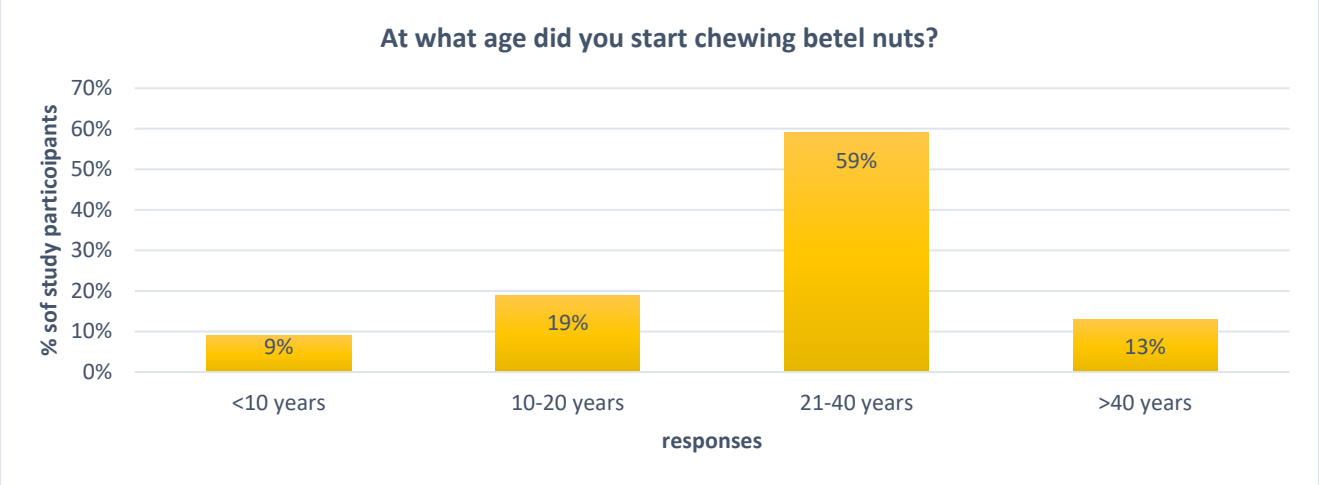

Figure 3: Illustration of age of onset of chewing betel nut.

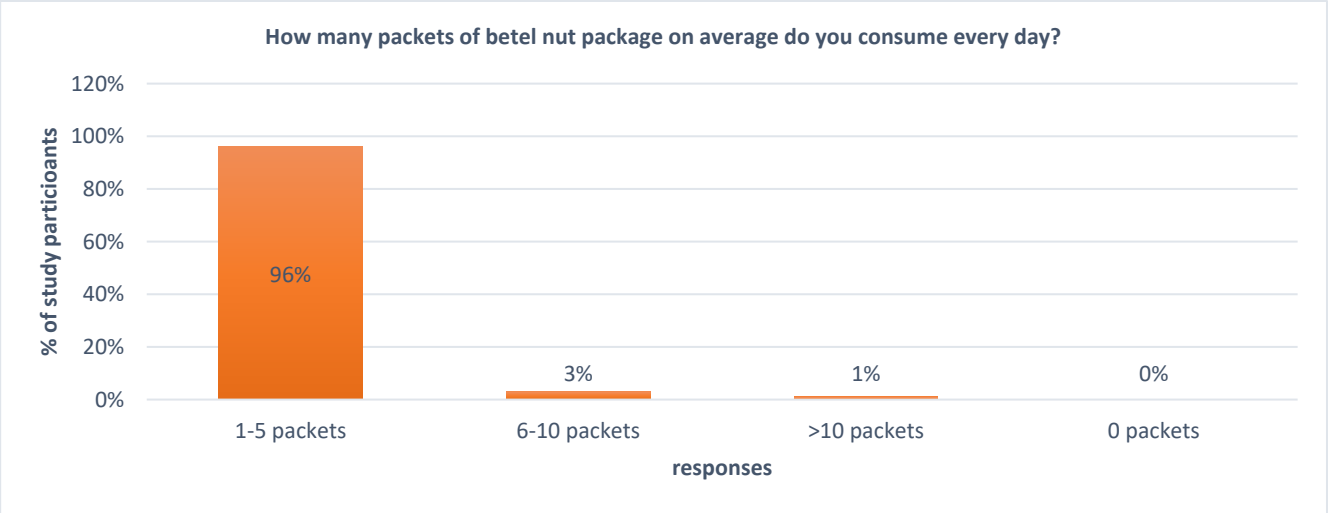

Figure 4: Illustration of packets of betel nut consumption.

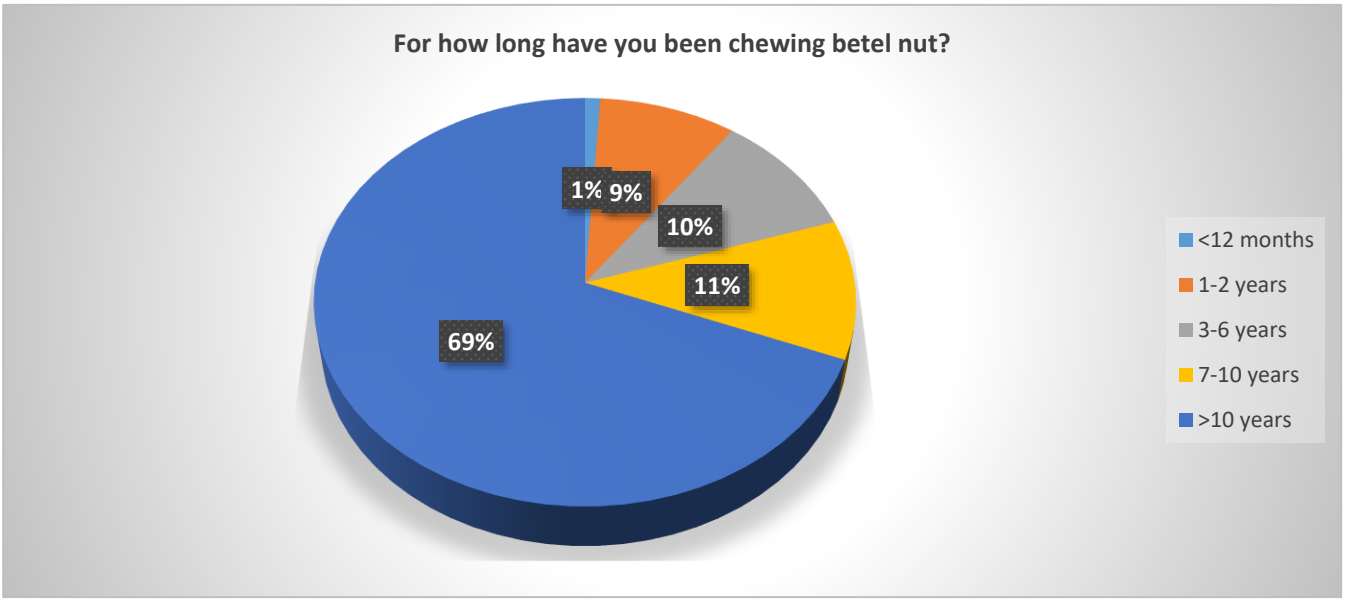

Figure 5: Duration of chewing betel nut among participants.

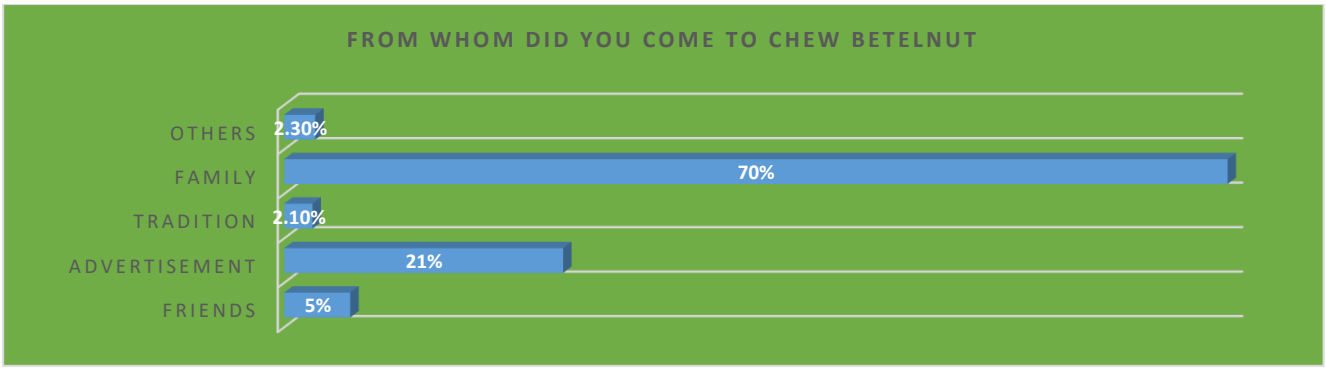

Figure 6: Attitude status of betelnut chewing among participants.

Table 1: Age and gender distribution of participants in the study.

Gender and age (in years)	N	Percentage
Males	43	15.1
Females	242	84.9
Total	285	100
25-35	58	20.4
36-45	98	34.4
46-55	74	26.0
56-65	44	15.4
66-75	11	3.9
Total	285	100

Table 2: Descriptive statistics among the individuals who participated in the study.

Questions	N	Minimum	Maximum	Mean	SD
From whom u learn to chew betel nut?	285	1	3	2.07	0.691
Chewing betel nut-immediate effect	285	1	3	1.50	0.781
Does chewing betel nut cause oral cancer?	285	1	3	1.85	0.808
Is betel nut dangerous to health	285	1	3	1.79	0.884
Does chewing betel nut cause throat cancer?	285	1	3	2.08	0.475
Any advantages of chewing betel nut?	285	1	3	2.07	0.670
Chewing betel nut-oral mucosal rash	285	1	4	2.83	0.987
Any effect on the heart?	285	1	3	1.49	0.620
Any increase in the capacity of work?	285	1	3	1.40	0.618
Increase your salivation?	285	1	3	2.45	0.589
Any effect on pregnancy?	285	1	3	2.48	0.603
Any effect on the kidneys?	285	1	3	2.00	0.460
Is chewing betel nuts a good habit?	285	1	2	1.17	0.375
Is chewing betel nut is addiction?	285	1	2	1.91	0.288
Any consultation with a doctor?	285	1	2	1.29	0.457
Will you try to stop chewing betel nuts?	285	1	3	1.13	0.363
How often do you consume?	285	1	3	1.05	0.225
How many packets do you consume every day?	285	1	5	2.24	0.893
Form of consumption?	285	1	5	4.36	1.074
Duration of having the habit of chewing betel nuts?	285	1	5	1.56	0.544
Does anyone else in your house chew betel nut?	285	1	4	2.63	0.814
At what age did you start chewing betel nuts?	285	1	3	1.72	0.460
Do u chew betel nuts in forbidden areas?	285	1	4	3.31	0.853
How long do you keep betel nut in your mouth?	285	2	3	2.02	0.132
Do you swallow or spit?	285	1	3	2.16	0.512
Any sweating experience while chewing?	285	1	5	1.81	1.303
How often do u brush?	285	1	5	4.16	1.405
The pattern does betel nut you consume in a day?	285	1	5	2.90	1.552

Table 3: Knowledge status of betel nut chewing in rural community population.

S.no	Question	Responses	%	SD
1	Is betel nut chewing dangerous to health?	Don't know	41%	0.781
		Yes	33%	
		No	26%	
2	Does chewing betel nut cause throat cancer?	Don't know	52%	0.475
		Yes	30%	
		No	18%	
3	Does chewing betel nut increase your work capacity?	Don't know	7%	0.618
		Yes	57%	
		No	36%	
4	Does betel nut chew affect pregnancy?	Don't know	49%	0.603
		Yes	46%	
		No	5%	

DISCUSSION

In the rural areas of the Kadapa district, areca nut chewing has been the main form of tobacco use among locals, wage earners, and particularly women. To date, no research on arecanuts has been conducted in the Kadapa district of Andhra Pradesh. The use of betel nut has not been given the necessary focus from public health and global health policy perspectives.[15] The WHO reported that tobacco consumption in all forms was 65% among men and 33% among women.[16] A study by Oswal et al found that men were 2.3 times more likely to chew arecanut in any form than women.[17] However, this contrasts with the current study, where 84.9% of women had a higher rate of arecanut consumption than men.

Among those who began chewing betelnut, 59% initiated the habit at a younger age, specifically between 21 and 40 years, which significantly influenced their continued use and addiction to chewing betelnut. In total, 71% of the participants attempted to quit chewing areca nuts. This percentage is comparable to the findings of Oswal et al where 77% of participants expressed willingness to stop if they were made aware that areca nut is carcinogenic. In the current study, 70% of the participants learned to chew areca nut from family members. A school-based study by Hussain et al reported that 82% of areca nut users were influenced by family members who also practiced chewing.[18] This underscores the role of family or peer influence in areca nut consumption. The areca nut habits within a family significantly affect a child's behavior and consumption pattern.

A study by Chadda and Sengupta revealed that 57% of participants attributed the initiation of tobacco use among children and teenagers to peer influence.[19] The primary reason for consumption is the belief that chewing betel nut enhances their ability to work. Regrettably, a larger proportion of participants were unaware that chewing betel nuts can lead to throat cancer. This suggests that awareness programs about the negative effects of tobacco use are currently at a crucial stage in the country.

Areca nut, whether combined with tobacco or not, is a carcinogen for humans. It comprises 11-26% tannins and 0.15-0.67% alkaloids, both of which are recognized for their cytotoxic and genotoxic properties. The likelihood of developing cancer is further increased by the use of smokeless tobacco. The lime used in quid contains a higher level of arsenic, a toxic and carcinogenic.[20] In this study, 59.6% of participants consumed betelnut with tobacco, which has been linked to an increased risk of oral squamous cell carcinoma, particularly when tobacco is included in the quid.

Policy implications

Healthcare professionals, the media, and communities must implement comprehensive strategies. Behavioral interventions have been shown to be significantly effective in decreasing smokeless tobacco consumption.[21,22] Betel nut products should feature prominent pictorial health warning labels. It is essential to conduct awareness campaigns and create social support groups for individuals addicted to chewing betel nuts. Regular oral cavity screenings, coupled with awareness initiatives at the institutional level, are advised, particularly for women's groups, to prevent arecanut use.

Limitations

The limitations of this study include the use of convenience sampling. Employing probability sampling techniques to select participants could help remove any sampling bias and make the findings more generalizable to the population.

CONCLUSION

Female wage workers, were at a higher percentage of betelnut chewers compared to males. Individuals learn to chew arecanut, especially the younger group, from family members. The risk of oral cancer is high when the quid contains tobacco. Periodic screening of the oral cavity with awareness programs at the institutional level is

recommended, especially in women's groups. Extensive measures should be taken by health care workers, the media, and the community to avoid arecanut usage.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee IEC 014/IEC/GDCH/2024-25/90

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