

Study on Effects of Tobacco (Smoked and Chewed) and Areca Nut on Oral Health and Quality of Life in Indian Population Not Having Overt Oral Malignancy

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Abstract

Background: Tobacco dependence is a major public health problem that results in significant morbidity and mortality. Approximately, 5 million people are killed annually by tobacco use. In this study we wanted to assess the oral health status and quality of life among adult tobacco users (smoked and chewed) and areca nut users.

Methods: This was a longitudinal case control study. Each one of the study subjects (tobacco users of more than one year duration, n = 296) & healthy subjects (non-users, n = 150) were interviewed by a questionnaire based on 5-point Likert scale. Questionnaire consisted of 11 questions of different quality of life aspects in Hindi (vernacular), each question having 5 options. Minimum score was 11 depicting good quality of life and highest score was 55 representing significantly poor quality of life.

Result: The greater duration of usage of gutka, gutka and bidi, gutka, bidi and cigarette, bidi and cigarette, areca nut and pan masala have attained higher scores and there was a fall in percentage of individuals with lower scores when the duration of usage was increased. Minor oral cavity problems were present in the subjects who used tobacco and areca nut. Study subjects with lower scores were less when compared to healthy subjects i.e., 14.48 % study subjects were between 11 - 20 compared to 65 % of healthy subjects. This was also statistically significant with p value of < .001.

Conclusion: The study concludes that duration of tobacco usage correlated with individual's quality of life and as evident from this work, study subjects with duration of usage of tobacco/areca nut for > 15 years attained higher scores and the percentage of study subjects with lower scores increased for duration of < 5 years.

Keywords: QoL, tobacco

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Introduction

It is well evident that use of tobacco either smoked or smokeless leads to development of oral, pulmonary, genitourinary, and gastrointestinal cancers. Prolonged tobacco use also contributes to various

cardiovascular disorders. However, usage of tobacco, smoked or smokeless and areca nut leads to certain quality of life issues related to taste, staining of teeth, opening of mouth, bad breath, and certain

psychological issues. In a recently published world health organization (WHO) global review of oral health^[1] which suggested oral health and hygiene is still a major problem especially in third world countries.^[1] Poor oral health may have a profound effect on general health. Prolonged use of tobacco leads to poor oral health and hygiene to an extent that individuals experience recurrent pain, difficulty in chewing and eating due to loose tooth, tooth decay or decreased mouth opening. People with stained, discoloured, or missing teeth have problems in socializing and smiling in public. Prolonged tobacco use can produce change in sensitivity for various taste sensations. All these factors have a negative effect on the quality of life of an individual. Furthermore, oral diseases restrict activities at work and at home causing millions of work hours to be lost each year throughout the world. The carcinogenic potential of tobacco and its adverse effect on cardiovascular health has been variously studied and reported. In this paper, we address the various local oral effects of

tobacco which adversely affect the quality of life of an individual.

The purpose of the present article is to summarize current concepts of such local effects, especially the non-malignant changes in the mouth such as dry mouth, halitosis, tooth staining, difficulty in opening of mouth, recurrent oral ulcerations, changes in taste acuity & psychological issues associated with tobacco use & in turn their effect on the quality of life of the individual.

Methods

It was a longitudinal case control study. Each of the study subject (tobacco users of more than one year duration, n = 296) & healthy subjects (non-users, n = 150) were interviewed by a questionnaire based on 5 point Likert scale. Questionnaire consisted of 11 questions of different quality of life aspects in Hindi (vernacular), each question having 5 options. Minimum score was 11 depicting good quality of life and highest score was 55 representing significantly poor quality of life.

Results

Table 1: Gutka

Scores	1 - 5 Years (n = 27)	> 15 Years (n = 30)	Z Value (DF = 55)	p Value
11 - 20	13 (48.15 %)	3 (10.00 %)	2.91	P < 0.01
20 - 30	7 (25.93 %)	11 (36.67 %)	0.59	P > 0.05
30 - 40	5 (18.52 %)	10 (33.33 %)	0.97	P > 0.05
40 - 55	2 (7.41 %)	6 (20.00 %)	0.99	P > 0.05

P > 0.05- not significant, p < 0.01- moderate significant

Subjects who have used gutka up to 5 years (n = 27). Out of these 27 subjects, 13 are in score group 11 - 20, 7 lie in 20 - 30, 5 lie in 30 - 40, 2 lie in 40 - 55 score group. Subjects who have used gutka for more than 15 years (n = 30). Out of these 30, 3 subjects lie in group 10 - 20, 11 lie in group 20 - 30, 10 lie in 30 - 40 group, 6 lie in 40 - 55 score group. There was a non-significant

correlation between duration of gutka usage and minor oral cavity problems which was evident by the fact that individuals with greater duration of usage gutka have attained higher scores and there was a fall in percentage of individuals with lower scores when the duration of usage was increased.

Table 2: Gutka + Bidi + Cigarette

Scores	1 - 5 Years (n = 8)	> 15 Years (n = 34)	Z Value (DF = 40)	p Value
11 - 20	3 (37.50 %)	1 (2.94 %)	2.33	P < 0.05
20 - 30	2 (25.00 %)	13 (38.24 %)	0.29	P > 0.05
30 - 40	3 (37.50 %)	13 (38.24 %)	0.37	P > 0.05
40 - 55	0 (0.00 %)	7 (20.59 %)	0.88	P > 0.05

P > 0.05 - not significant, p < 0.05- significant

Subjects who have used gutka with bidi and cigarette for up to 5 years (n = 8). Out of these, 3 lie in 10 - 20 score group, 2 lie in score group 20 - 30, 3 lie in score group 30 - 40 and 0 lie in score group 40 - 55. Subjects who have used gutka, bidi and cigarette for more than 15 years (n = 34). Out of these, 1 lie in score group 10 - 20, 13 lie in score group 20 - 30, 13 lie in score group 30 - 40, 7 lie in score group 40 - 55.

There was a non-significant correlation between duration of gutka with bidi and cigarette usage and minor oral cavity problems which was evident by the fact that individuals with greater duration of usage gutka with bidi and cigarette have attained higher scores and there was a fall in percentage of individuals with lower scores when the duration of usage was increased.

Table 3: Bidi + Cigarette

Scores	1 - 5 Years (n = 22)	> 15 Years (n = 26)	Z Value (DF = 46)	p Value
11 - 20	5 (22.73 %)	1 (3.85 %)	1.53	P > 0.05
20 - 30	12 (54.55 %)	9 (34.62 %)	1.10	P > 0.05
30 - 40	5 (22.73 %)	7 (26.92 %)	0.00	P > 0.05
40 - 55	0 (0.00 %)	9 (34.62 %)	2.69	P < 0.01

P > 0.05 - not significant, p < 0.01- moderate significant

Subjects who have used bidi and cigarette for up to 5 years (n = 22). Out of these, 5 lie in 10 - 20 score group, 12 lie in score group 20 - 30, 5 lie in score group 30 - 40 and 0 lie in score group 40 - 55. Subjects who have used bidi and cigarette for more than 15 years (n = 26). Out of these, 1 lie in score group 10 - 20, 9 lie in score group 20 - 30, 7 lie in score group 30 - 40, 9 lie in score group 40 - 55.

There was a non-significant correlation between duration of bidi and cigarette usage and minor oral cavity problems which was evident by the fact that individuals with greater duration of usage bidi and cigarette have attained higher scores and there was a fall in percentage of individuals with lower scores when the duration of usage was increased.

Table 4: Areca Nut + Pan Masala

Scores	1 - 5 Years (n = 10)	> 15 Years (n = 17)	Z Value (DF = 25)	p Value
11 - 20	3 (30.00 %)	2 (11.76 %)	0.67	P > 0.05
20 - 30	3 (30.00 %)	1 (5.88 %)	1.14	P > 0.05
30 - 40	3 (30.00 %)	5 (29.41 %)	0.40	P > 0.05
40 - 55	1 (10.00 %)	9 (52.94 %)	1.82	P > 0.05

P > 0.05- not significant

Subjects who have used areca nut and pan masala for up to 5 years ($n = 10$). Out of these, 3 lie in 10 - 20 score group, 3 lie in score group 20 - 30, 3 lie in score group 30 - 40 and 1 lie in score group 40 - 55. Subjects who have used areca nut and pan masala for more than 15 years ($n = 17$). Out of these, 2 lie in score group 10 - 20, 1 lie in score group 20 - 30, 5 lie in score group 30 - 40, 9 lie in score group 40 - 55. There

was a non significant correlation between duration of usage of areca nut and pan masala and minor oral cavity problems which was evident by the fact that individuals with greater duration of usage of areca nut and pan masala have attained higher scores and there was a fall in percentage of individuals with lower scores when the duration of usage was increased.

Table 5: Control vs. Cases

Scores	Healthy Subject (n = 150)	Study Subject (n = 296)	Z Value (DF = 444)	p Value
11 - 20	98 (65.33 %)	42 (14.19 %)	10.89	P < 0.001
20 - 30	52 (34.67 %)	111 (37.50 %)	0.48	P > 0.05
30 - 40	0 (0.00 %)	94 (31.76 %)	7.65	P < 0.001
40 - 55	0 (0.00 %)	49 (16.55 %)	5.12	P < 0.001

P > 0.05- not significant, p < 0.001- highly significant

Shows healthy subjects who have not used tobacco or areca nut ($n = 150$). Out of these healthy subjects, 98 lie in 10 - 20 score group, 52 lie in score group 20 - 30, 0 lie in score group 30 - 40 and 0 lie in score group 40 - 55. Study subjects are those who have used one or many forms of tobacco products or areca nut ($n = 296$). Out of these study subjects, 42 lie in 10 - 20 score group, 111 lie in score group 20 - 30, 94 lie in score group 30 - 40 and 49 lie in score group 40 - 55. Study subjects had higher score range 31 % and 16 % in 30 - 40 and 40 - 55 score groups respectively. No healthy subject had score above 30 that was statistically significant with p values of < .001 for both groups calculated by Chi-square test. Study subjects with lower scores were less when compared to healthy subjects i.e. 14.48 % study subjects were between 11 - 20 compared to 65 % of healthy subjects. This was also statistically significant with p value of < .001.

Discussion

Tobacco use is one of the greatest burdens to the health and well-being of male and female. Tobacco kills nearly 6 million

people every year, of which nearly 5 million die due to the direct use of tobacco.^[2] In the present study, we found that tobacco (smoked or smokeless) & areca nut use have a negative effect on quality of life of an individual. Since the data regarding the present study objective is limited we could not compare with the literature studies.

The prevalence rate of smoking and chewing tobacco has found to be significantly high among males (89.8 %) as compared to females (10.2 %) in Ahsan et al., study which is comparable to study done by Sarkar et al. where (21.5 %) of the women population either smoked or chewed tobacco.^[3] Similar results were also found study done by Petkar et al.^[4] where 92.8 % of the tobacco users were males while 7.2 % were females. This could be due to that it is not seen socially acceptable for women to consume tobacco in any form.

Socio-economic status is one of the risk factors for tobacco users and poor oral health outcomes. Majority of tobacco users in the Ahsan et al., study were from the upper lower socio-economic class (33.5 %)

and upper middle class (27.0 %). This is comparable to the study done in Barabanki^[5] where study subjects were from the upper lower 25.8 % and lower class (39.6 %). This could be due to lower socio-economic class people are more likely tobacco consumption because lack of knowledge and awareness.

Effective self-care oral hygiene practices such as tooth brushing, use of inter-dental cleaning are the key means of preventing and controlling periodontal diseases. In the Ahsan et al. study, the overall prevalence of the oral mucosal lesions was higher among tobacco users (76 %) as compared to non-tobacco users (6.2 %). This is in accordance with the findings of the epidemiological study carried out by Vellappally^[6] in the selected Indian population to assess the oral health status in relation to different type of tobacco habits. This may be due to smoking and gutka consumption which has betel and tobacco as main ingredient. The tobacco users had high prevalence of dental caries (88.0 %) as compared to non-tobacco users as found in Ahsan et al., study, Vellappally.^[6] This is due to decreased buffering effect, possible lower pH of smoker's saliva and higher number of Lactobacilli and Streptococcus mutans group may indicate an increased susceptibility to caries in smokers and a biologically reasonable explanation for an association between chewing tobacco use and dental caries may be the presence of high levels of fermentable sugar in chewing tobacco products, which can stimulate the growth of cariogenic bacteria.

The prevalence of tooth wear in the Ashan et al., study was high (89.2 %) as compared to non-tobacco users (69.0 %). The finding was similar to the study by Patil et al.^[7] the mechanism through which tobacco cause tooth wear lesion may be through local frictional and vascular effects. Smoking and quality of life (QoL) was found to have a negative association. This negative relationship has been described across populations of diverse socio-economic and

cultural groups from around the world.^[8-22] The magnitude of the association appears to be dose dependent on number of cigarettes smoked and is maintained up to 3 years after an individual achieves smoking cessation.^[11,12,23]

Differences between smokers and non-smokers domain and subscale scores uncover specific factors, which influence the relationship between QoL and smoking. The physical domain score represents the smoker's perception of their health. As expected, smokers consistently report lower physical domain scores than non-smokers.^[23,24-30] Smokers also report suffering from greater disability, impairments in mobility, and self-care.^[10,14] The differences in physical domain scores may be slightly larger in men.^[24]

Social functioning, role-emotional, and vitality domain scores have also been found to be negatively associated with smoking.^[12,19,25-29] However, the largest number of studies reported a negative relationship between smoking and the mental domain of QoL.^[16-19,31-35]

Within dentistry, clear links exist between tobacco and health (both general and oral). Dentists routinely come into contact with patients who use tobacco in order to provide the primary care in dental issues; they can contribute to tobacco control programmes through a range of public health interventions. Dentists have a 'potential target' while carrying out work on a patient, and as such have an excellent opportunity to advise patients and encourage tobacco cessation. Dentists are the only healthcare professionals who frequently see 'healthy' patients and therefore are in a very good position to identify possible tobacco related problems early. The links between tobacco and oral health provide an ideal opportunity for the dental team to become involved in tobacco cessation strategies. Tobacco use is as much an issue for dentists as it is for other healthcare professionals but, if dental patients are to benefit from tobacco cessation interventions, dentists need to be

clear about their roles nationally, locally and within the team in their own practice. If dentists truly want to care for the oral health of their patients, they must take tobacco cessation seriously. According to Final Operational guidelines TCC 2018 the dental health care provider can play an important role in identifying and motivating the individuals while providing the primary care and later can collaborate with an interdisciplinary team to assist the individual to quit the habit.

Smoking cessation is associated with lasting and enduring improvements in QoL. This association has been identified across nations, co-morbid diseases, and diverse socio-economic and cultural groups. The positive effects of smoking cessation on QoL are impressive and should be highlighted for all smokers and especially those who are considering quitting.

QoL data should also be used to counsel patients on smoking cessation treatment options. For example, patients who receive treatments, including varenicline and bupropion, report QoL improvements with increasing length of abstinence, as compared to individuals who do not receive pharmacotherapy. Improving QoL during smoking cessation is important because individuals with low QoL are less likely to successfully quit and unsuccessful quitters are more than two times likely to report frequent mental distress, physical distress and pain (than smokers who never tried to quit). Moreover, if QoL is an independent moderator of smoking cessation outcomes, then picking a treatment option that specifically targets improvement in QoL may also improve smoking cessation rates. Future research should be aimed specifically to further our understanding of how different pharmacotherapies for smoking cessation impact QoL and cessation rates.

Conclusion

Tobacco (smoked or smokeless) & areca nut use have a negative effect on quality of

life of an individual that is statistically significant ($\chi^2 = 138.450$, $p < 0.001$) when compared to non-users. Duration of tobacco usage correlated with individual's quality of life and it was evident from this work that study subjects with duration of usage of tobacco/areca nut for > 15 years attained higher scores and the percentage of study subjects with lower scores increased for duration of < 5 years.

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