A comparative study to assess general health status and oral health score of tobacco users and nonusers in geriatric population in central India

Rashmi Bhujade¹, Tarique Ibrahim², Arun Kumar Wanjpe³, Dharampal Singh Chouhan⁴

¹Department of Community Medicine, Index Medical College Hospital and Research Centre, Indore, ²Department of Health, Medical Officer, Civil Hospital Siwan, Uttar Pradesh, ⁴Department of Community Medicine, R. D. Gardi Medical College and Hospital, Ujjain, Madhya Pradesh, India, ³Professor Department of Community Medicine, Universal College of Medical Science and Teaching Hospital, Siddharth Nagar Bhairahawa, Nepal

Abstract

Background: Globally about 5 million deaths every year can be ascribed to tobacco use. It leads to many systemic and oral diseases. These diseases in geriatric population are common and more hazardous. **Methods:** Cross-sectional study was conducted in rural area of a teaching hospital to assess general health status and oral health scores of 500 geriatric age group tobacco users and non users. Data analysis was done with SPSS version-20. Chi square test and Mann Whitney U rank test were applied. **Results:** Poor self assessed health status was found in tobacco users as compared to nonusers. Significant limitation was found among the tobacco users as compared to nonusers. Significant association was found between the presence of diabetes, COPD, and tobacco use. Tobacco use was found to be significantly associated with poor oral health. **Conclusion:** Statistically significant poor general and oral health was found in tobacco users than nonusers.

Keywords: General health, geriatric population, non tobacco users, oral health, tobacco user

Introduction

Tobacco use is a reprehensible habit and became an epidemic. Each year an estimated seven million deaths are attributed to the use of tobacco.[1] Mortality due to tobacco use in India is around 1.3 million.[1,2] Smoking will become the main cause of death with > 10million death per year.[3] Nonsmokers have higher life expectancy than a smoker.[4] It is an important risk factor for many systemic and oral diseases. Smokers have poorer general health than nonsmokers.[5] Current study had objectives to compare the general health and oral health of tobacco users and nonusers.

Materials and Methods

After obtaining the ethical clearance from the Institutional ethical committee of above-mentioned teaching hospital, study was conducted in a block of rural field practice area. Block was consisting of 20 villages. Study population was geriatric population. Who were permanent resident and were present at the time of data collection was included in the study, while elderly who were not willing to participate were excluded from study. As the prevalence of smoking in rural geriatric cannot be found, prevalence of 45%[6] of tobacco

Address for correspondence: Dr. Rashmi Bhujade,
EWS-396/596, Indra Nagar, Near Pani Ki Tanki,
Agar Road, Ujjain - 456 001, Madhya Pradesh, India.
E-mail: drbhujaderashmi@gmail.com

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use was utilized to calculate the sample size, by applying the formula $(1.96)^2 pq/l^2$, taking 45% prevalence of tobacco use in elderly, relative error 10% with 95% confidence limit; the estimated sample size was worked out to be 470 persons. $N = (1.96)^2 pq/l^2$ {where, N = Sample size, P = Prevalence = 45, q = 100-prevalence, l = Relative error of prevalence 10%}. Therefore $N = (1.96)^2 \times 45 \times 55/4.5 \times 4.5 = 470$. So the calculated sample size was 470 with adding nonresponse rate of 5% sample size was calculated as 494 which was rounded to **500.** Study participants were selected by simple random method. We visited along with the representative village medico social worker to identify and locate the selected individual. After explaining the purpose of the study informed written consent was taken. The participants were assured of confidentiality of information given by them. Then face-to-face interview was conducted by using semi structured proforma. Data analysis was done by using statistical software SPSS 20 Version. For all the tests 'P' value of < 0.05 is considered as statistically significant at 95% C.I.

For assessing the general health of individual we have utilised the selected[7] measures suggested to assess general health status for US population. According to which it can be assessed by various measures but we have selected feasible measures like self-assessed health status, limitation of activities and the presence of chronic diseases for present study.

Activity of daily living (bathing, showering, dressing, eating, getting in and out of the bed, walking, using toilet), instrumental activities of daily living (using telephone, doing light/heavy house work, preparing meals, shopping of personal items, managing money), inability to do job work and difficulty in remembering all mentioned domains were assessed to know the limitation of activity.

Result and Observation

Table 1 is showing maximum 53% participants were from 60 to 69 year age group, 33% belonged to 70–79 year age group and 14% were from >80 year age group. Almost equal male and female participants were there in study group. Maximum, 97%, participants were hindu. Approximately 71% participants were literate, 56% participants were not doing any job at the time of study, 67% were married, 83% were from joint family. Around 93% participants were from lower socio-economic status, and 51% were smokers.

Table 2 shows general health status of study participants about 2%, 27%, 29% study participants graded their health status as excellent, very good, and good, respectively, while 22.8%, 19.2% participants assessed their health status as fair and poor, respectively. Among study participants 3.4% did not experienced limitation in any type of activity, while 25.6%, 17.4%, 36.2%, and 17.4% study participants experienced limitation in daily activities, instrumental daily living activities, work/job activities, and remembering, respectively.

Table 1: Characteristics of participants

Variables	Category	Frequency (%)
Age	60-69	267 (53.4%)
	70-79	164 (32.8%)
	>=80	69 (13.8%)
Total		500
Gender	Male	251 (50.2%)
	Female	249 (49.8%)
Total		500
Religion	Hindu	485 (97.0%)
	Muslim	15 (3.0%)
Total		500
Literacy	Illiterate	356 (71.2%)
	Literate	144(28.8%)
Total		500
Occupation	Farming	171 (34.2%)
	Other than farming	49 (9.8%)
	Earlier farming now not working	280 (56%)
Total		500
Marital status	Living with spouse	337 (67.4%)
	Living alone (Widow/Widower/Never married)	163 (32.6%)
Total		500
Family type	Nuclear	87 (17.4%)
	Joint	413 (82.6%)
Total		500
SES	1	0
	2	6 (1.2%)
	3	31 (6.2%)
	4	242 (48.4%)
	5	221 (44.2%)
Total		500
Smokers	Yes	255 (51%)
	No	245 (49%)
Total		500

Table 2: General Health status of participants

		Frequency (%)
Self assessed health status	Excellent	10 (2%)
	Very good	135 (27%)
	Good	145 (29%)
	Fair	114 (22.8%)
	Poor	96 (19.2%)
	Total	500
Limitation of activity	No	17 (3.4%)
	Daily living	128 (25.6%)
	Instrumental daily living	87 (17.4%)
	Work /job	181 (36.2%)
	Remembering	87 (17.4%)
Presence of chronic disease	Cardio vascular disease	180 (36%)
	Arthritis	191 (38.2%)
	Diabetes	211 (42.2%)
	Asthma	55 (11%)
	COPD	272 (54.4%)

Approximately 36%, 38.2%, 42.2%, 11%, and 54.4% had known cardio-vascular diseases, arthritis, diabetes, asthma, and

COPD, respectively. Figure 1 is showing general health status of study participants, self assessed health status, limitation of activity and presence of chronic disease.

Table 3 shows statistically significant association was found between self assessed health status, limitation in all selected domains of activities and tobacco use. The presence of diabetes and COPD was found to be statistically significantly associated with tobacco use, as after applying chi square test *P* value for all mentioned above was <0.05.

Figure 2 box plot shows the oral score for tobacco users& non users.The median oral health score for tobacco users was 13 and for non users it was 5. This shows there was big difference in their scores. Figure 3 box plot shows the oral health score for the different type of tobacco users.The median oral health score was 13, 12 and 11 for combined form of tobacco user, smoked & smokeless form respectively.

Table 4 shows after applying Mann Whitney U rank test statistically significant higher mean rank (Oral health score) was found in tobacco user as compared to non users. Among smokers statistically significant higher mean rank (oral health score) was found in smoked form of tobacco users as compared to smokeless form of tobacco users. In dual form of tobacco users statistically higher mean rank was found as compared to either form of tobacco users alone. Higher the mean rank (oral health score) poor the oral health.

Discussion

Main results of the current study are general health was significantly compromised in smokers of geriatric population as compared to non smokers. Oral health of geriatric smokers was also found to be poor as compared to non smokers. As studies with the similar objectives as current study could not be found so the studies with partial similar objectives were considered for discussion.

Several studies[8-10] arrived at conclusion that smoking is associated with poor health status, and these findings are having resemblance with our study findings. One study[11] revealed that the prevalence of tobacco related chronic diseases among smokers was higher than nonsmokers for hypertension, coronary diseases, and chronic bronchitis. Evidences also supports that prevalence of COPD,[12] asthma,[13] premature development of microvascular complications in type 2 diabetes,[14] hypertension, cardio vascular diseases, COPD, limitation physical health and pain[15] are more commonly found to be associated with smoking. John W. *et al.*[16] concluded that as compared with never smoked, adjusted hazard ratios was more in current smokers for all-cause cardiovascular disease. Recent study[11] also concluded that smokers had more chronic disease. As the presence of chronic disease reflect poor general health, but above-mentioned study was done on the participants of age group more than 18 years of age. Another investigation[17] revealed that smoking can reduce both aerobic and anaerobic fitness. Study[18] showed that there was no significant association of smoking with all type of osteoarthritis as found in current study also. While current study documents that statistically significant association was found between smoking, diabetes and COPD. Yingying Yi*et al.*[19] found that as compared to nonsmokers, current smokers had decreased self-evaluated memory, daily living activities and cognitive function. In recent years, researchers pay more attention to the negative impacts of smoking on working memory.[20,21] In Comparison with non-smokers, smokers have weaker performance in cognition and memory.[22-25]

| Table 3: Association of General health variables with tobacco use							
		Tobacco use		**Total**	**df**	**Chi square value**	**P**
		Yes	**No**				
Self assessed health status	Poor	196 (76%)	13(5.3%)	209	1	262.98	0.000
	Reasonable	59 (23.13%)	232 (94.7%)	291			
	Total	255	245	500			
Limitation of activities	Inability to do daily activity Yes	175 (68.62%)	90 (36.73%)	265			
	No	80 (31.37%)	155 (63.36%)	235	1	51.02	0.000
	Inability to do instrumental Yes	188 (73.72%)	124 (50.61%)	321			
	daily living activity No	67 (26.27%)	121 (49.38%)	188	1	28.45	0.000
	Inability to do work /job Yes	216 (86.4%)	180 (73.46%)	396			
	No	39 (15.29%)	65 (26.53%)	104	1	9.57	0.002
	Inability in remembering Yes	161 (63.13%)	68 (27.75%)	229			
	No	94 (36.86%)	177 (72.24%)	271	1	63.01	0.000
	Total	255	245	500			
Presence of chronic disease	Diabetes Yes	119 (46.66%)	92 (37.56%)	211			
	No	136 (53.33%)	153 (62.44%)	289	1	4.25	0.03
	Total	255	245	500			
	COPD Yes	170 (66.66%)	102 (41.63%)	272	1	31.56	0.00
	No	85 (33.33%)	143 (58.36%)	228			
	Total	255	245	500			
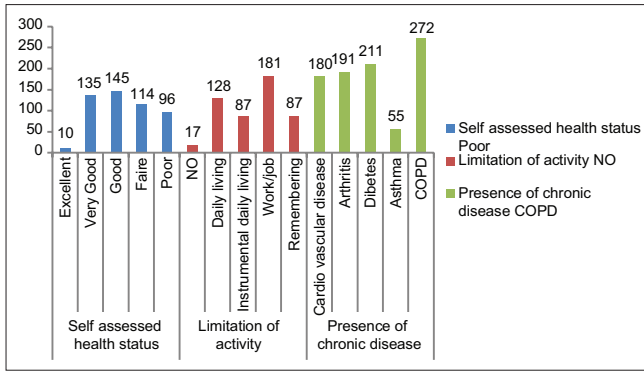
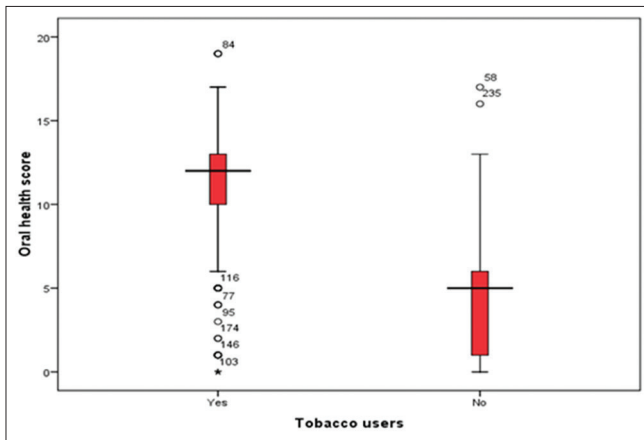**Figure 1:** General health status of study participants

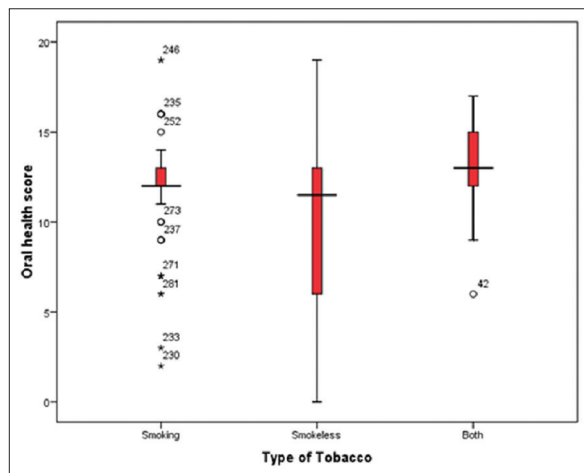**Figure 2:** Oral health score of tobacco users and nonusers

Figure 3: Oral health scores of tobacco users according to type of tobacco use

Many studies[26-29] confirmed that smokers have poor oral health. One study[28]concluded that tobacco consumption in both forms caused poor periodontal status, with smokeless tobacco users having more amount of attachment loss than smokers. This study's[28] results are partially similar to current study as poor oral health was found in smokers but in this study more poor health was found in smokeless form of tobacco users while current

Table 4: Association of oral health with tobacco use

Variable	Category	Frequency	Mean rank	*P*
Oral health score	User	223	338.33	0.000
	Nonuser	277	141.40	
	Total	500		
Oral health score	Smoking	99	137.63	0.000
	Smokeless	134	101.76	
	Total	223		
Oral health score	Smoking	99	69.65	0.000*
	Combine form	66	103.02	
Total	Total	165		
Oral health score	Smokeless	134	80.47	0.000*
	Combine form	66	141.17	
Total	Total	200		

study concluded that more poor oral health was found among the smoked form of tobacco users.

Conclusion

Tobacco use has been proven to be an important determinant of general health status of individuals. Tobacco use was found to be associated with poor health perception, various activity limitation and the presence of chronic diseases. Along with the various physical discomforts tobacco was also associated with poor oral health. Morbidity in geriatric age group can be hugely attributed to tobacco use. If we can reduce/stop tobacco use we can help in reducing the morbidity and mortality because of tobacco-related diseases, thus we can contribute in healthy aging.

Key message: Physical health and freedom disability is the single most important asset for elderly and closely linked to their functional ability. Primary care can be made more responsive, if we can figure out the factors influencing the health status (may be general or oral) of elderly. Current study collected the evidence that tobacco use is the risk for general as well as oral health of elderly. Results of this study can be used as a tool/source for policy makers, stake holders, and healthcare providers to modify services provided, updating the training content for healthcare providers and design age friendly interventions to better fit to health needs and health problems of elderly population, and can prevent/delay the disease process. Ultimately the quality of life of elderly people can be improved by a cost sensitive risk management approach, and thus contributing in healthy aging.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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