

Oral Self Care Behavior and Utilization of Dental Care among Rural Older Adults Using Trans-Theoretical Model of Behavior Change in Sathnur, Karnataka

Nikhil Ahuja^{1*}, Pramila.M^{2**}, Umashankar G.K^{3**}, Nitya Sharma^{4**}, Nirmal Ahuja⁵

¹Senior Lecturer, ²Professor and HOD, ³Reader, ⁴Post Graduate Student,

*Department of Public Health Dentistry, Vaidik Dental College and Research Centre, Daman, India

**Department of Public Health Dentistry, M.R. Ambedkar Dental College and Hospital, Bangalore, India

⁵Faculty, Prin. L.N. Welingkar Institute of Management Development and Research, Mumbai.

Corresponding Author: Nikhil Ahuja

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ABSTRACT

Objectives: Self-care is one means by which older adults actively engage themselves in managing their oral health without access to professional care. This study aims to assess oral self care behavior and utilization of dental care among rural older adults using Trans- theoretical model of behavior change.

Methods: A cross sectional study was conducted among 215 people aged 60 years and above in Sathnur, Karnataka. Four villages were selected at random for the purpose of the study. A 13 item questionnaire representing Trans-theoretical model was developed, placing individuals in different stages of behavior change. Data regarding demographic and socio-economic factors was obtained. Descriptive, Chi- square and Fischer exact tests were used to analyze the data.

Results: Overall, 33.5% participants were in pre contemplation stage while 66.5% went into contemplation stage. About 35.8% and 30.7% of participants stopped at the preparation and action stage with only 14.9% going till the maintenance stage. 27.2% participants visited the dentist for their oral health problems while 72.7% participants used a variety of self care behaviors, with majority using complementary therapies. Oral health problems showed significant association with use of self care behaviors and dental visit.

Conclusion: Understanding the extent, to which older adults choose self care behavior in addition to professional dental care, is paramount for a comprehensive approach to meeting their health care needs.

Key words: oral health, self care, utilization, behavior, Trans theoretical model.

INTRODUCTION

Oral health is increasingly being seen as essential for maintaining general health and well-being for the elderly. ^[1,2] Health authorities worldwide are now confronting an increasing public health problem, including a growing burden of oral disease among older people. Oral health for older

people is a priority action area in the WHO Global Oral Health Programme. ^[3] Aging is a universal process and a normal inevitable biologic phenomenon. ^[4] One of the major criteria of successful ageing is maintaining a natural healthy functional dentition throughout life, including social and biological benefits such as aesthetics,

comfort and ability to chew, taste and speak. [5]

Worldwide there are 600 million people aged 60 years and above. This will double by 2025 and is projected to reach 2 billion by 2050. India is one of the largest democracies in the world, with a population of one billion. Considering the fact that a sizeable population of India is graying, it is predicted that the elderly population of the country shall be among the highest in the world by the year 2025, i.e. 177 million (80% of them residing in rural areas). [4,6] The rural aging population in contrast to their urban counterparts is illiterate, poor, and ignorant. The standard of living and economic status is low and dental treatment is therefore obviously neglected till tooth loss is the final result. [6-9]

Older adults have an increased likelihood of having physically, medically or pharmaceutically compromising conditions that will affect their oral health. They usually experience higher rates of tooth loss, dental caries, periodontal disease, xerostomia and oral cancer. Oral health problems can be considered chronic diseases because their prevalence and duration; besides, risk factors are common with those of other chronic diseases, such as diabetes or cardiovascular problems. [2,6,10,11] Dental problems in the elderly are also associated with modifications in food selection, changes in nutrient intake leading to malnutrition resulting in limited mobility. [6]

Self-care is one means by which older adults can actively engage in managing their oral health without access to professional care. Dental self-care behaviors include changes in diet and regular mouthwash use to prevent oral health problems (toothache pain, bleeding gums, tooth loss), and the use of over-the-counter pain relievers, over-the-counter topical medication, and a wide variety of home and complementary therapies to treat toothache and bleeding gums. Complementary

therapies are known to be used widely among older adults; however, few studies have examined the use of complementary therapies for oral health in the general population or specifically among older adults. [12,13]

There is a gross disparity in oral health care utilization among urban and rural population, especially among the elderly. As age increases, dental care utilization decreases from 51.1% to 35.5% as dependency on mobility and financial constraints increase. [6,7] There has been a lot of interest in understanding oral health care utilization behavior as it is important for the delivery of effective oral health care. [14] Thus, Utilization of dental services and its barriers are important parameters in oral health care planning. [6]

In the recent oral health literature, behavior is considered as a determinant of oral health. There are many theoretical models of behavior change. In the context of dental behavior, one of the models of behavior change that seems to be relevant is the Trans theoretical Model (TTM). In the early 1980's, James O. Prochaska and Carlo C. DiClemente began work on the TTM in an attempt to understand how people intentionally modify a behavior. [15] The Trans theoretical model describes behavior change as a process. It occurs stepwise in several stages of change. The stages are precontemplation (not intending to change), contemplation (considering a change), preparation (actively planning a change), action (actively engaging in a new behavior), and maintenance (taking steps to sustain change and resist temptation to relapse). The stages of changes can often be moved through in a cyclical pattern, and thus individuals may regress to one or more stages before moving forward; it is not necessarily a permanent linear progression. [8,15-17]

Although trans-theoretical model of behavior change has been widely applied to

a wide range of problem behaviors (like increasing exercise, modifying diet, changing high-risk behaviors like smoking etc.), there is not a great deal oral health literatures, particularly in India, which discuss the trans-theoretical model of behavior change as a framework to assess self care behavior and utilization of dental care among elderly. In the present study, however, this model was used to assess the stages of change that older adults went through in seeking out dental care for their oral health problems in the past 12 months. Thus, the aim of the present study was to assess oral self care behavior and utilization of dental care among rural older adults using Trans -theoretical model of behavior change in Sathnur, India.

MATERIALS AND METHODS

Study Setting and Population: A cross sectional study was carried out from January to March 2014 to assess the self care behavior and utilization of dental care among rural older adults using Trans theoretical model of behavior change. The study was conducted in Sathnur, one of the Hoblis in the Kanakapura taluk of Ramnagaram district, 80kms from the main city of Bangalore, India. Ethical clearance and approval to conduct the research was obtained from the institutional ethical committee.

There are total 18 PHCs in Kanakapura taluk, among which, Sathnur has one of the upgraded Primary Health Centres (PHC's). There are 30 villages under this PHC. To obtain a representative sample of population, 4 villages were selected at random for the purpose of the study. The total number of older adults in Sathnur is 2868 as per the survey of census during 2011 by Government of India. A house to house survey was conducted to identify individuals aged 60 yr and above with oral health problems. Those with communication difficulties, psychiatric

disease or severely ill on the day of interviewing were excluded from the study. Since there was no previous literature measuring oral self care and dental utilization in rural older adults, a pilot study was conducted on 30 randomly selected individuals from the sample population. However, these subjects were excluded from the main study. Based on prevalence of dental utilization (16%) from the pilot study, using confidence level of 95% and design effect 1, sample size was estimated to be of 193. Final sample size was taken as 215 after considering 10% non- response rates.

Study instrument measures: The data was collected by personal interviews using a structured questionnaire with a good reliability (Cronbach's α 0.83). It consisted of two sections. The first part included informed consent and information on basic socio-demographic variables (age, gender, marital status and socioeconomic status). BG Prasad scale was applied for classifying individuals into different socioeconomic categories. The participant's self reported general health conditions, medications used daily and oral health problems were recorded.

The second part consisted of a 13 item questionnaire representing Tran's theoretical model (TNM) that placed the individuals in different stages of behavior change. In the present study, however, this model was used to assess the stages of change that older adults went through in the past 12 months in seeking out dental care for their oral health problems (**Figure 1**). Individuals who were not thinking about getting treatment done were designated at pre contemplation stage while those who thought about getting treatment done were considered in the contemplation stage. Preparation stage included individuals who planned to do something for their oral problems. The individuals using either self care behavior or dental visit were placed at the action stage. In the maintenance stage,

were individuals who continued using either self care behavior or dental visit for their oral health problems. Relapse occurred in those individuals who failed to maintain their health seeking behavior in the form of self care or dental visits. The responses were recorded as Yes or No for each item. The stages of change follow the cyclic pattern, and thus individuals may regress to one or more stages before moving forward.

Questions to assess self care behavior included medications from

friends/relatives, OTC medications, OTC dental products and complementary therapies. Dental utilization was also measured along with the reported reasons for not visiting dentist.

Statistical analysis: Data were analyzed using SPSS version 22. Descriptive statistics (frequencies) were produced to summarize the data whereas chi square and Fischer's exact test was used for comparison of categorical data. Level of statistical significance was set at $P < 0.05$.

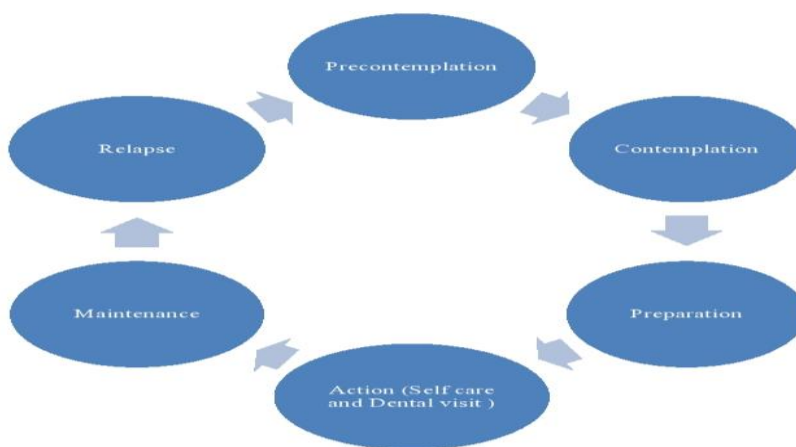


Figure 1. Trans- theoretical model of behavior change

RESULTS

A total of 215 rural older adults were approached to participate in the study. The participants had a mean age of 68.8 yrs. There was more number of males than females. Majority of participants belonged to lower middle category of socio-economic status (75.8%). Most of them were married (84.7%). (Table 1)

More than half of the participants did not report any general health problems and use of medications. Tooth pain (26%), loose teeth (16.7%) and edentulousness (21.4%) were the main oral health problems. About

27% of participants reported having more than one oral health problems. (Table 2)

When different stages of change model were considered, 33.5% of the participants were in the pre contemplation stage and the remaining 66.5% went into contemplation stage. About 35.8% of the participants stopped at the preparation stage, which also included those who neglected and got use to the oral problems (5.1%). About 30.7% of the participants went into the action stage. Finally, a total of 14.9% participants were in the maintenance stage with relapse occurring among 15.8% participants. (Table 3)

Table1. Distribution of Socio demographic characteristics of the respondents (n=215).

Characteristics	n (%)
Gender	
Male	125 (58.1)
Female	90 (41.9)
Socioeconomic status category	
Upper	0
Upper middle	2 (0.9)
Middle	2 (0.9)
Lower middle	163 (75.8)
Lower	48 (22.4)
Marital status	
Married	182 (84.7)
Unmarried	0
Widowed	33 (15.3)

Table2. Distribution of General and Oral Health characteristics of the respondents (n= 215).

Characteristics	n (%)
Number of general health problems	
None	131 (60.9)
1-2	70 (32.6)
3-4	10 (4.7)
≥5	4 (1.8)
Number of medications used daily	
None	135 (62.8)
1-2	68 (31.6)
3-4	8 (3.7)
≥5	4 (1.9)
Oral health problems	
Tooth pain	56 (26)
Bleeding gums	10 (4.7)
Loose teeth	36 (16.7)
Food lodgment	6 (2.8)
Stained teeth	3 (1.4)
Edentulousness	46 (21.4)
More than one oral problems	58 (27)

Majority of participants (72.7%) were engaged in a variety of self care behaviors. More than half (54.5%) of the older adults used the complementary therapies. Only 27.2% of them visited the dentist for their oral health problems. (Table 4)

Table3. Distribution of rural older adults in different stages of change model. (n= 215)

STAGES OF CHANGE	n (%)
I) Pre contemplation	72 (33.5)
II) Contemplation	143 (66.5)
III) Preparation	77 (35.8)
IV) Action	66 (30.7)
Self care behavior	48 (22.3)
Dental visit	18 (8.37)
V) Maintenance	32 (14.9)
Self care behavior	20 (9.3)
Dental visit	12 (5.6)
VI) Relapse	34 (15.8)
Self care behavior	28 (13)
Dental visit	06 (2.8)

Table4. Distribution of Self care behaviors used for oral health and utilization of dental care among rural older adults (n= 66).

Behaviors	n (%)
Self care behaviors	48 (72.7)
Medications from friends/family	7 (10.6)
OTC Medicine	15 (22.7)
OTC Dental products	0
Complementary therapies	36 (54.5)
Salt water gargling	16 (24.2)
Placing herbs on the tooth	7 (10.6)
Wrapping something around the head tightly	1 (1.5)
Pulling the tooth themselves	3 (4.5)
Ayurvedic medications	6 (9.2)
Multiple use of complementary therapies	3 (4.5)
Utilization of dental care	
Dental visit	18 (27.2)

Table5. Association of socio demographic characteristics and general/oral health problems with self care behavior (medication from friends/family and OTC medicine) among rural older adults.

General/oral problems	Self care behavior n (%)			
	Medications from friends/family (n=7)	p-value	OTC medicine (n= 15)	p-value
Number of general health problems				
None	3 (42.8)		13 (86.7)	
1-2	3 (42.8)	0.37	2 (13.3)	0.02*
3-4	1(14.2)		0	
≥5	0		0	
Number of medications used daily				
None	3 (42.8)		13(86.7)	
1-2	3 (42.8)	0.172	2 (13.3)	0.01*
3-4	1(14.2)		0	
≥5	0		0	
Oral health problems				
Tooth pain	1(14.2)		8 (53.3)	
Bleeding gums	0		0	
Loose teeth	2 (28.6)		2 (13.3)	
Food lodgment	0	<0.001**	0	<0.001**
Stained teeth	0		0	
Edentulousness	0		0	
More than one oral problems	4 (57.1)		5 (33.3)	

Statistical evaluations by using Fischer's exact test. *p<0.05 significant, **p<0.001 highly significant

Table6. Association of socio demographic characteristics and general/oral health problems with self care behavior (complementary therapies) among rural older adults.

Characteristics and general/oral problems	Self care behavior (complementary therapies) n (%)						
	Salt water gargling (n=16)	Placing herbs (n=7)	Wrapping head tightly (n=1)	Pulling the tooth themselves (n=3)	Ayurvedic medications (n=6)	Multiple use of CT (n=3)	P-value
Socioeconomic status category							
Upper	0	0	0	0	0	0	
Upper middle	0	0	0	0	0	0	
Middle	0	0	0	0	0	0	0.03 *
Lower middle	14 (87.5)	5 (71.4)	1 (100)	1 (33.3)	6 (100)	2 (66.6)	
Lower	2 (12.5)	2 (28.6)	0 (0)	2 (66.6)	0 (0)	1 (33.3)	
Oral health problems							
Tooth pain	6 (37.5)	5 (71.4)	0	0	2 (33.3)	0	
Bleeding gums	1 (6.25)	0	0	0	0	0	
Loose teeth	4 (25)	1 (14.3)	1 (100)	0	2 (33.3)	1 (33.3)	0.02 *
Food lodgement	0	0	0	0	0	0	
Stained teeth	0	0	0	0	0	0	
Edentulousness	0	0	0	0	0	0	
More than one oral problems	5 (31.2)	1 (14.3)	0	3 (100)	2 (33.3)	2 (66.6)	

Statistical evaluations by using Fischer's exact test. *p<0.05 significant; **p<0.001 highly significant

Table7. Association of socio demographic characteristics and general/oral health problems with dental visit among rural older adults (n=18)

Characteristics and general/oral problems	Dental visit	
	n (%)	P value
Gender		
Male	14 (77.7)	0.19
Female	4 (22.2)	
Socioeconomic status category		
Upper	0	
Upper middle	0	0.55
Middle	0	
Lower middle	16 (88.8)	
Lower	2 (11.1)	
Marital status		
Married	16 (88.8)	
Unmarried	0	0.43
Widowed	2 (11.1)	
Number of general health problems		
None	10 (55.5)	
1-2	7 (38.8)	0.51
3-4	1 (5.5)	
≥5	0	
Number of medications used daily		
None	10 (55.5)	
1-2	7 (38.8)	0.31
3-4	1 (5.5)	
≥5	0	
Oral health problems		
Tooth pain	5 (27.7)	
Bleeding gums	1 (5.5)	
Loose teeth	8 (44.4)	
Food lodgment	0	<0.001*
Stained teeth	0	*
Edentulousness	1 (5.5)	
More than one oral problems	3 (16.7)	

Statistical evaluations by using Chi-square test, **p<0.001 highly significant

Table 8. Reasons for not visiting dentist among rural older adults. (n=48)

Reasons	N (%)
Financial	8 (16.7)
Time availability	2 (4.2)
Fear of dentist	0
Language barriers	0
Problems with transportation	9 (18.8)
Problems with dentist availability	8 (16.7)
In relation to medical problems, dental problems are not so important	16 (33.3)
Not aware of dentist	17 (35.4)

Highly significant association between oral health problems and use of OTC medicines and medications from friends/family (P <0.001) was seen. No significant differences were reported when gender, socioeconomic and marital status were compared with OTC medicines and medications from friends/family (p >0.05). (Table 5). However, only socioeconomic status and oral health problems were found to be statistically significant with the use of complementary therapies among older adults (P <0.05) whereas other variables showed no significant association. (Table 6)

Significant association between dental visit and oral health problems was reported (P<0.001). No statistical difference was found when other variables were

compared with dental visit. (Table 7) When asked about the reasons for not visiting the dentist, most of the participants were not aware of the dentist (35.4%) and did not consider dental problems as important in relation to medical problems (33.3%). (Table 8)

DISCUSSION

Older people may be more reliant on self care behavior to manage the oral conditions associated with ageing. Members of rural communities share beliefs and experiences that affect their willingness to use different forms of health care. ^[18] The present study was the first study that used a cross-sectional design to explore the oral self care behavior and utilization of dental care among rural older adults based on the TTM frame work.

In the present study, however, TNM model was used to assess the stages of change that older adults went through in seeking out dental care for their oral health problems in the past 12 months. It was found that 33.5% and 66.5% of the participants were in the pre contemplation and contemplation stages respectively. When assessed further, about 35.8% of the participants stopped at the preparation stage. There were only 45.6% of the participants in the late stage of change (action and maintenance). These findings are in contrast to a study done by Hricko G ^[17] in an adolescent orthodontic population regarding oral self care behavior, where only 21% of the participants were in the early stage of change, 20.6% were in the preparation stage and about 58% of the participants were in the late stage of change. Thus, it can be noted that smaller number of participants in our study in the late stages of change may be because many of them cannot afford dental care or may not be motivated enough to seek out dental care.

Relapse was seen among 15.8% of the participants, among which 13% of

participants didn't want to continue using self care behavior which indicates that use of self care behavior may have provided temporary relief from oral problems instead of complete relief. Even few participants didn't want to continue dental visit, which may be because of bad experience with the dentist in terms of treatment provided to them. Thus, according to TTM model, participants who underwent relapse may again start from the pre contemplation stage and the stages of change can be moved through in a cyclical pattern again. It can now be noted that thinking and doing processes are important throughout all stages of behavior change when it involves adopting a positive behavior. Furthermore, if and once we are able to identify what stage individuals are in, then we can design stage-specific intervention strategies to help individuals progress through the stages of change toward adopting a positive behavior of seeking dental care which can be of utmost importance for clinicians and policy makers.

In our study, 72.7% subjects were engaged in a variety of self care behavior. Majority of participants used complementary therapies in which the most widely used was the salt water gargling followed by placing herbs on the affected area, wrapping something around the head tightly, pulling the tooth themselves and Ayurvedic medications. The results support the idea that the participants generally delayed seeking care from a dentist for as long as possible and were mostly dependant on self care strategies. These findings are similar to the studies done by Cohen LA ^[19] and Au et al, ^[20] where most of the participants used complementary therapies in the form of acupuncture/massage and Chinese herbal medications in solving their problem of orofacial pain. Additionally, the use of temperature, salt, baking soda, vinegar, vitamins or minerals, placing aspirin on affected areas and rinsing the

mouth with toxic products (rubbing alcohol, chlorine bleach) for those with oral pain, bleeding gums, and dry mouth were also seen in a study done by Arcury TA et al. [12] The use of medicinal plants for curing oral health problems was also seen as important in a study done by Gambhir RS et al. [21]

However, in our study, no significant association was seen when gender, marital status, number of general health problems and number of medications used were compared to the use of complementary therapies whereas significant differences were seen with respect to socioeconomic status and oral health problems. These findings are similar to a study by Arcury TA et al [12] where significant differences were seen for oral health problems like oral pain, bleeding gums, stained teeth, dry mouth and the use of complementary therapies. Sex and age, ethnicity, culture and education were seen as the predictors of complementary therapy use among older adults in a study done by Corwin P. [22]

In rural India, practitioners of traditional medicine like Ayurveda, Unani and Homeopathy are easily available. Studies indicate that 90% of Ayurvedic physicians live in rural areas. These alternative forms of health care tend to be cheaper than dental services and are often preferred by the elderly in the lower economic strata. [6] Knowledge about the use of complementary therapy by older rural adults is particularly relevant because older rural residents have been shown to be more independent, engage in more self-care, have less access to allopathic care, and have a higher prevalence of chronic oral health conditions than their urban counterparts. Complementary therapy could have beneficial effects when used alone or in combination with allopathic health care, could have no effect, or could be contraindicated in other situations. Understanding the extent to which older rural dwellers choose complementary care,

in addition to allopathic care, is paramount for a comprehensive approach to meeting their health care needs. [23]

In our study, OTC Medicines and medications from friends/relatives were used by 22.7% and 10.6% of older adults respectively. None of the older adults used OTC dental products. These findings are in contrast to a study done by Arcury TA et al, [12] where around 84.4% used OTC dental products for their oral health problems and only 12.2% participants used OTC medications. In the studies done by Cohen LA, [19] Au et al, [20] McLaughlin et al, [18] many of the participants used over-the-counter products, home remedies and communicated with other individuals in their communities, including spiritual advisers, family members, neighbors, and friends in their quest for pain relief.

In the present study, number of general health problems and number of medications used daily among older adults were significantly associated with OTC Medications. Oral health problems had the most consistent patterns of association with OTC medicines and medications from friends/family. Similar findings have been reported in relation to oral health problems and use of OTC medications in a study by Arcury TA et al. [12] Thus, it is not surprising that older adults in rural areas may be influenced by the environment and culture of their surrounds and trying self treatment when they have dental problem may be due to fact that dental diseases are not life threatening and people have enough knowledge of drugs available over the counter which relieve them of their dental pain or discomfort. [14] Both complementary and other self care strategies in rural settings are suggested to benefit from robust informal community networks and thus dental care providers need to discuss the use of these self care strategies with their patients. [12,18]

The primary reason why people seek health services is their belief that they need health care and that the situation will get worse without professional help. [11] In the present study, only 27.2% participants visited the dentist for their oral health problems, remaining used the self care behavior as described previously. This finding is in line with a study done by Cohen LA. [19] This is because most of the participants were not aware of the dentist, had negative attitudes towards oral health as dental conditions are not serious or life threatening. Financial, time availability, problems with transportation and dentist availability were other reasons reported for not visiting dentist. These findings are consistent with a study done by Thomas S, [6] Parlani S et al, [9] Jain V K et al, [14] Cohen LA, [19] Niesten et al, [25] Poudyal S et al. [24] It is suggested that to motivate people successfully, one not only has to give them information but also has to pay attention to the individual reasons which restrict their behavior. Imparting preventive dental education and strengthening of the primary health centers can go long way in reducing these barriers. [21]

In our study, dental visit among older adults was significantly associated with oral health problems. Similar findings have been reported in a study done by Goel P et al. [4] No significant differences were seen with respect to socio demographic characteristics and general health problems in this study. These findings are in contrast to the studies done by Kiyak HA et al, [11] Castrejón-Pérez et al, [2] Gambhir RS et al, [21] where significant association was found between socio demographic characteristics, general health problems and dental visit whereas significant differences were seen in relation to socioeconomic status, sex and religion in a study done by Poudyal S. [24]

The results of this analysis must be interpreted in light of specific limitations. The research on which this analysis is based

used a cross-sectional survey design. Therefore, it is not possible to document causal relationships. Similar cross-sectional study designs using the TTM framework have recognized that this study design makes it impossible to determine if the differences between the stages are antecedents or consequences of change. Longitudinal designs are therefore recommended. Self-report adds an inherent, yet unavoidable, element of recall bias of the participants. Also, such form of questionnaires using interview method allows possible misinterpretation of questions by subjects and thus it could affect the results.

CONCLUSION

This research shows that most rural older adults engage in a variety of dental self-care behaviors, including the use of OTC products and complementary therapies. The major factor leading to the use of self-care behaviors is need. The results also supported the idea that in order to motivate people successfully to use professional dental care, one has to pay attention to the individual reasons which restrict their behavior. Thus, older patients provide unique challenges and rewards and understanding their needs will be a particularly important aspect of oral care in the future.

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