

PERCEPTION OF DENTAL PRACTITIONERS REGARDING THE USE OF ANTIOXIDANTS IN ORAL HEALTH

Ravneet Kaur Randhawa*, Nidhi Gupta, Mohit Bansal, Vikram Arora, Preety Gupta, Sahil Thakar

Department of Public Health Dentistry, Swami Devi Dyal Hospital and Dental College, Barwala, Panchkula district, Haryana, India

ABSTRACT

Background. Free radicals play a key role in the development of several pathological conditions. Therefore, antioxidants (AOs) are the first line of defense against free radical damage and are critical for maintaining optimum health and well-being.

Objectives: To assess the perception of dental practitioners regarding use of antioxidants in oral health.

Method. A cross-sectional questionnaire study was conducted among 296 dental practitioners in Tricity (Chandigarh, Mohali, Panchkula, India). A self-structured close-ended questionnaire was used to assess the perception of dentists regarding the use of antioxidants in their patients. It consisted of 12 questions with dichotomous response and five point likert scale ranging from strongly agree to strongly disagree. Descriptive statistics were used to summarize the data, followed by the *Chi-square* test to check significant differences between the responses. Correlation between responses were analysed through the Spearman's rank correlation. Statistical analysis was done using Statistical Package for Social Sciences version 20 (Illinois, Chicago, USA).

Results. A statistically significant difference was observed between genders, with females 181 (61%) having more knowledge than males 115 (39%) regarding the use of antioxidants in their clinical practice. It has been found that dental professionals in academics prescribes more antioxidants to their patients than the private practitioners. Postgraduates 76 (77.6%) had a higher level of knowledge than graduates 86 (43%).

Conclusions. Knowledge about antioxidants should be highlighted in the health sciences curriculum. It is recommended to expand the use of antioxidants in oral health to bring down the burden of chronic diseases like periodontitis and catastrophic diseases like precancerous lesions and oral cancer.

Key words: *antioxidants, free radicals, mouth neoplasms, oral health*

INTRODUCTION

Oxygen is essential for the existence of human beings. Yet, in contradiction, it is also involved in harmful reactions and therefore is a constant threat to the wellbeing. Most of the potentially adverse effects of oxygen is believed to be due to the production and activity of reactive oxygen species. Reactive oxygen species are either free radicals that are molecules containing at least one unpaired electron [6, 8].

In a world in which we live, free radicals can come from many sources and contribute to downturn of our health. Sources of free radicals include pollutants, metal ions, high intakes of polyunsaturated fatty acids, drugs, smoking and radiation. These may lead to cell damage resulting in inducement of cancer, neurological

diseases, diabetes, vascular diseases, autoimmune diseases, lung cancer, aging and eye diseases [12].

Free radicals are very much reactive and have the ability of destroying almost all types of biomolecules. When there are too many free radical molecules in the body, the imbalance is called "oxidative stress". In the oral cavity, oxidative stress is associated with inflammation of the gums (gingivitis) and other soft tissues (periodontitis). But factors including dental procedures, bleaching agents, dental cements, exposure to nicotine, alcohol consumption, composite fillings and metals used in dentistry also lead to oxidative stress [20].

The role of antioxidants (AOs) in the oral tissues is becoming an issue of budding interest. Recent studies have indicated the need for AO supplementation for prevention and effective treatment of disorders associated

*Corresponding author: Ravneet Kaur Randhawa, Department of Public Health Dentistry, Swami Devi Dyal Hospital and Dental College, Barwala, Panchkula, Haryana, India, tel. +91 8968045451; e-mail: ravneetkaurran@gmail.com

with gingival tissues and other supporting structures of the teeth.⁵Antioxidants are available from different sources, including vitamins, hormones, minerals and enzymes, as well as food and herbal supplements [3].

Various studies [1, 7] prove that antioxidants play major role in the prevention of oral cancer as well as in premalignant lesions like Leukoplakia, Oral Sub Mucous Fibrosis and also helps in delaying the onset of cancer. A study showing the effect of Lycopene, a commonly used antioxidant in oral cancer has proved that high doses of Lycopene (8mg/day) are useful in improvement of oral health [16].

Despite of playing such an important role, in preventing various major oral health diseases like Oral Cancer, Periodontal Problems And Dental Caries they are still in the back step and still not being prescribed by dental professionals. Therefore this study is conducted to know the perception of dental professionals regarding antioxidants and their knowledge towards antioxidants that whether they are important for the betterment of oral health or not.

MATERIALS AND METHOD

A cross-sectional study was conducted among 296 dental practitioners in Tricity (Chandigarh, Mohali, Panchkula, India). List of dental practitioners was obtained from the state I.D.A branches. The protocol of the study was approved by Institutional ethical and review board. Subjects were randomly approached to participate in the study and only those (296) who agreed to participate were included in the study. A written, informed consent was obtained from the study subjects, after explaining them about the aim and objectives of the study, as well as the fact that participation was totally on a voluntary basis and was completely anonymous.

Details of the dental practitioners were recorded and the questionnaire was divided into two sections. Section A included questions regarding sociodemographic profile like age, gender, and number of years of practice, and whether they are teaching in any educational institution or into private practice or both and section B includes the questions related to the perception of dentists regarding the role of antioxidants in the dentistry using a two page, self-structured closed ended questionnaire.

The responses were obtained using a 5-point likert scale ranging from strongly agree to strongly disagree. The questionnaire was in English and its respective psychometric properties (validity) was assessed. Content validity was assessed by a panel of experts consisting of staff members of the Swami Devi Dyal Hospital & Dental College, Panchkula, India. The purpose was to depict those items with a high degree of agreement among experts.

High knowledge among dental practitioners was assessed by determining the mean of responses which served as a cutoff point for the same (3.4). A pilot study

was performed on 30 subjects to determine the test-retest reliability of survey question. The respondents were also asked for feedback on the clarity and whether there were any difficulty in answering the question or ambiguity to what sort of answer was required. Few modifications were made based on the response given by the study subjects to improve the understanding of the questionnaire. Face validity was also assessed and it was observed that 92% of the participants found the questionnaire to be easy. Cronbach's *alpha* (α) of the questionnaire was found to be good (0.82).

The participants of pilot study were not included in the final analysis.

Descriptive statistics were used to summarize the data, followed by the Chi square test to check significant differences between the responses. Correlation between responses were analyzed through the Spearman's rank correlation. Statistical analysis was done using Statistical Package for Social Sciences version 20 (SPSS 20). All significant test were two tailed and p value of less than 0.05 was considered to be statistically significant.

RESULTS

A total of 296 subjects were enrolled in present study comprising of 115 (39%) males and 181 (61%) females. A higher number of subjects 157 (53%) belonged to the age group of 20-29 years whereas the lowest number of subjects 24 (8%) belonged to the age group of 40 years & above. Considering their working status, 193 (65%) of the subjects were teaching in a dental college, 15 (5%) were practicing in dental clinics and 88 (30%) were doing both academics as well as practicing dentistry. Based on the level of education, 98 (33.1%) were post graduates and 198 (66.9%) were graduates (Table 1).

Table 1. Socio-demographic profile of study subjects

Variables	Respondents	
	Number	%
<i>Gender</i>		
Male	115	39
Female	181	61
<i>Age groups</i>		
20-29 yrs	157	53
30-39 yrs	115	39
40+ yrs	24	8
<i>Working status</i>		
Teaching	193	65
Private practice	15	5
Both	88	30
<i>Level of education</i>		
Post Graduates	98	33.1
Graduates	198	66.9
Total	296	100

Table 2. Responses of the study subjects regarding their knowledge about antioxidants

Items	Male n (%)	Female n (%)	p-value
<i>Do you know what antioxidants are?</i>			
Yes	115 (100)	181 (100)	1.0000
No	0 (0)	0 (0)	
<i>Do you know about the natural antioxidants present in our diet?</i>			
Yes	112 (97.44)	181 (100.00)	0.0295**
No	3 (2.56)	0 (0.00)	
<i>Do you know about the antioxidants present in human body?</i>			
Yes	92 (79.49)	137 (75.41)	0.04131**
No	23 (20.51)	44 (24.59)	

Test applied: *Chi square test*, **statistically significant $p < 0.05$

Table 2 shows the responses of the subjects based on the dichotomous scale (yes or no). It was seen that both the genders were well aware of antioxidants. A statistically significant difference along with a strong correlation was seen among both the genders with females 181 (100%) being more knowledgeable when asked if they knew about natural antioxidants present in our diet ($p=0.02$, $r=0.84$). No significant differences were seen in the knowledge of the genders when they were asked about the antioxidants present in the human body.

Table 3. Level of knowledge regarding antioxidants among study subjects

	Low level of knowledge n (%)	High level of knowledge n (%)
<i>Gender</i>		
Male	69 (51.47)	46 (28.66)
Female	65 (48.53)	116 (71.34)
<i>Age groups</i>		
20-29 yrs	69 (51.4)	88 (54.27)
30-39 yrs	44 (33.09)	71 (43.90)
40+ yrs	21 (15.44)	3 (1.83)
<i>Working status</i>		
Academics	99 (73.53)	94 (57.93)
Private practice	12 (8.82)	3 (1.83)
Both	23 (17.65)	65 (40.24)
<i>Level of education</i>		
Postgraduates	22 (22.4)	76 (77.6)
Graduates	112 (56.6)	86 (43.4)
Total	134 (45.3)	162 (54.7)

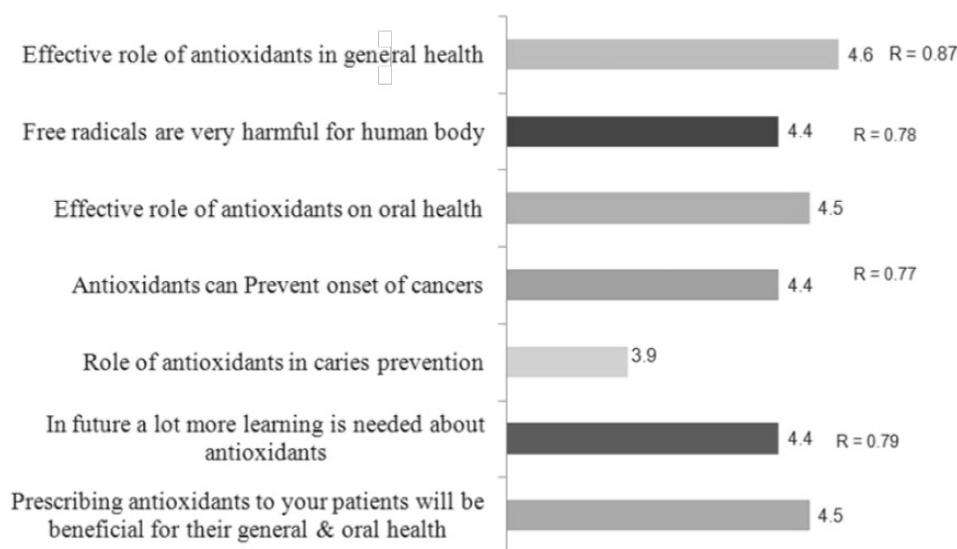


Figure 1. Mean response of participants about antioxidants

The level of knowledge among different study variables is presented in Table 3. Total questions regarding perception of antioxidants among dental practitioners were 16 out of which 10 questions have high knowledge. Females 116 (71.34%) were more aware when they were asked different questions regarding the antioxidants than males 46 (28.66%). The young dentists 88 (54.2%) with age group of 20-29 yrs were having higher level of

knowledge regarding antioxidants from the other age groups. Considering their working status, the dental professionals 94 (57.9%) who were academically involved were having higher level of knowledge from their other counterparts. Based on the level of education, the dental professionals who attain master degree 76 (77.6%) were having higher level of knowledge than bachelor ones.

Table 4. Sources of information about antioxidants

Source of information	Responses (%)
Newspaper	4
Articles	48
Internet	32
Books	15
Any other source	1

Table 4 shows the source from where the dental practitioner got information about the antioxidants and it was revealed that in 48% of dental healthcare personnel's main source of information were articles, followed by internet 32%. Only 15% of the oral health care personnel referred books.

Figure 1 describes the mean of the responses and correlation values of subjects on a 5-point likert scale. The highest mean value (4.6) was observed when the dental professionals were asked if antioxidants have effective role in general health, whereas the lowest mean value was acquired when asked whether antioxidants plays role in caries prevention (3.9) of the ten questions that revealed high knowledge only seven showed significant responses and were included in the analysis. Upon applying *Spearman's* correlation in respect to the above mentioned responses, it was observed that responses having a high mean (above 4.4) had a strong correlation as compared to other responses.

DISCUSSION

It is a well-known fact that antioxidants present in our body and diet are very essential in conserving good health. With growing awareness among people about health and preventing diseases, usage of antioxidants is ever-increasing. Dental Healthcare professionals play an enormous role in moulding the public opinions and beliefs regarding health-related issues and hence, it is crucial that the prescribing fraternity should be well-informed about nutrition and antioxidants present in our diet and its role in maintaining the good oral health [4, 14, 18].

In the present study, majority of the participants were females (61%). This was because of the large number of female students opting for the dental course as compared to males. Majority (53%) of them were in the age group of 20-29 years due to the reason that in the last ten years, so many new dental colleges have been established in India [11]. The remaining age groups 30-39 years and 40 or above were 39% and 8% respectively.

In the present study, a significant difference was observed between the age groups of 20-29yrs and 40 or above in their knowledge regarding antioxidants and their role in oral health. More information of antioxidants among young dentists can attributed to

their recent completion of their dental course as well as the use of internet, which is more among younger generation. A significant difference was observed between academicians and those doing private practice regarding knowledge scores ($p=0.001^*$), as dentists in teaching profession have more knowledge than doing private practice. The continued up to date knowledge with the subject may be the reason for this. Similar results were obtained by *Arora et al.* who reported low levels of knowledge among private practitioners as compared to academicians regarding dental floss use in the region of Delhi NCR [2].

Various studies have shown the role of antioxidants in the caries prevention, and a study done by *Shetty et al.* [16] has reported that free radicals in tobacco smoke increase the prevalence of dental caries. Another study done by *Motamayal et al.* [13] revealed that there are association between Total Antioxidant Capacity of saliva and dental caries and this may be helpful in caries prevention. In the present study, the knowledge of antioxidants in caries prevention to dental professional is low. As 35.9% males and 52.46% of the females responded neither agree nor disagree, it can be attributed to lack of knowledge or due to limited studies that shows the role of antioxidants in caries prevention.

Finally, when the dental practitioners were asked from where they got the maximum information regarding antioxidants, it was highlighted that their main source of information was from articles (48%) followed by internet (32%). Whereas usage of books and newspapers for information was only 15% and 4% respectively. Our results are in agreement to *Patil et al.* whose study reported that majority of graduate (40%) and postgraduate dentists (31.3%) gained their knowledge through journal articles only [15]. These statistics confirm our assumption that nowadays, most practitioners prefer to spend their time on their computers and pads, and prefer to read journals online on their devices, leading to increased computer and internet use. A study conducted by *Jali et al.* [9] concluded that computer knowledge was high among dental students but its dental application was limited compared with general purpose. However use of books and newspaper was low it may be due to their busy schedule or lack of interest.

Although dental practitioners in our community displayed positive beliefs in the usefulness of antioxidants and their role in oral health care, further research is needed to extensively appraise their knowledge, practice and extent of awareness about other forms of antioxidants, for which dentists may play a crucial role in counseling society.

Hence to conclude that, dental health personnel have good knowledge and attitudes towards natural antioxidants, but execution of their knowledge in their

profession is inadequate. All dental health personnel teaching in dental institutes in Tricity should consider natural antioxidants as part of the teaching course and heed to the task. Thus, to improve health care provisions, not only dentists, but other professionals should also be exposed to this course. So in order for this to be done, they should start exercising the use of antioxidants regularly in order to acquire, improve or maintain good oral as well as general health, since the results have shown that due to lack of knowledge the use of antioxidants is very finite. Furthermore natural antioxidants should be used in cancer patients to reduce treatment cost and to prevent the onset of cancer in normal person. Patients will tolerate standard treatment better, experience less weight loss, have a better quality of life, and most importantly, live longer than patients receiving no antioxidants. Thus, the burden of cancer and periodontal diseases in India will be reduced [10, 12].

A probable limitation in this study is social desirability bias as it describes the tendency of survey respondents to answer questions in a manner that will be viewed favorably by others [5]. The other limitation is social recall bias as the study includes participants 40 years and above and differences in the accuracy or completeness of the recollections retrieved by study participants regarding events or experiences from the past. Adding on to this it is unlikely that the respondents reacted validly to a short statement on a printed form in the absence of real-life qualifying situation.

CONCLUSION

Our study found that perception of dental health care personnel, regarding the use of antioxidants in oral health and their role in preventing dental caries is insufficient. Hence, it is crucial that knowledge about antioxidants should be highlighted in the health sciences curriculum with the objective of producing well-informed professionals who can later on have a positive impact on the health of society. Efforts to increase the level nutritional education is the basic necessity at the present time in contrast with past as major and deadly diseases like precancerous lesions and conditions, oral cancer can be cured by just acquiring healthy habits & burden of an extravagant treatment could be downsized.

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Conflict of interest

The authors declare no conflict of interest.

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