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Perceptions of preventive dentistry's economic value: A study among Jeddah's dental professionals and the general population

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ABSTRACT

Background: A main concern in preventive dentistry is the lack of awareness of the importance of preventive oral health care and the economic influence of applying these measures when compared to seeking treatment only when needed. This study aimed to assess the level of awareness and knowledge of dental professionals and the general population regarding the economic value of preventive dentistry. **Materials and Methods:** A survey questionnaire was distributed to assess the respondents' socioeconomic attributes, dental health knowledge, awareness of the cost of dental care services, and attitude toward preventive dental treatment. The level of knowledge was measured using an additive method, and the reliability of the variables was analyzed using Cronbach's Alpha Model. The relationships of the variables were measured using the Chi-square test, independent t-test, and one-way analysis of variance with the Least Significant Difference test as *post hoc* analysis. **Results:** The knowledge scores with respect to education levels, types of residency, income, employment status, and involvement in the dental field were all found to have statistically significant differences. Those in high socioeconomic standing and those associated with the dental field agree that regular dental visits can save more money than visiting dentists only when needed. **Conclusion:** This study defined the relationship between the respondents' socioeconomic status and their knowledge of the economic cost of preventive dentistry and their subsequent attitude toward it. The general population is well-informed on the economic value of preventive dentistry; however, the problem lies with the application of this knowledge.

Keywords: Awareness, knowledge, oral health care, preventive dentistry

Introduction

According to the World Health Organization, prevention includes measures not only to avert the occurrence of a disease and reduce risk factors but also to deter disease progression and lessen its consequences once the disease is established.[1] In the dental field, prevention is achieved through the application of multiple methods, such as scaling, administration of pit and fissure sealants, and fluoride application.[2,3] Lack of awareness about these preventive measures represents a challenge for preventive dentistry.[4] This is evident throughout the Middle East, especially in Saudi Arabia. For example, a study in Jeddah, Saudi Arabia, demonstrated that more than half of the participants lacked knowledge about fluoridated toothpaste or the correct way to use it.[5] In another study, only 37% of parents in the western region of Saudi Arabia were aware of the importance of fissure sealants.[6] Prevention is clearly of critical concern, as a systematic review on the determinants of dental caries in the Middle East reported that the prevalence of dental caries in children in Saudi Arabia ranged from 49% to as high as 91.3%.[7]

Another challenge to preventive dentistry is maintaining regular dental visits. Routine dental visits are recommended to determine the necessary dental requirements as well as to prevent further dental problems.[8] However, numerous studies found that more patients tend to visit the dentist irregularly than those who observe regular dental care.[9,10] The most common barriers to seeking regular dental care include

dental anxiety and fear, belief that treatment is not necessary, financial issues, and problem-oriented visiting, which is when the patient only seeks treatment when experiencing acute pain or a hindrance that is interfering with daily life.[10,11] In this regard, it is relevant to note that those from high socioeconomic standing are more likely to regularly visit dentists, as low personal income, limited budgets, lack of insurance coverage, and the high costs of treatment prevent many from low socioeconomic backgrounds from committing to regular dental visits.[3,8] However, this retroactively harms those from low financial standing, as delaying treatment risks disease progression or exacerbation into more serious oral health problems, which will ultimately cost more than the initial expense of treatment or prevention.[12,13] Therefore, it is imperative to raise awareness on the cost-effectiveness of routine dental visits and preventive dental care.

The cost-effectiveness of preventive care has been demonstrated in numerous studies.[14-17] Recently, a study in the United States reported that participants with regular preventive dental care had 43% reduced cost over 5 years compared to those with no regular preventive dental visits.[18] Furthermore, due to the bidirectional relationship between oral health and systemic diseases, preventive oral care can also lower health-care costs in general by reducing the risk of chronic illnesses such as diabetes and cardiovascular disease.[19-21]

Given the important nature of preventive dentistry, it should be a focal point in dental care, and yet that is not the case in many parts of the world, including Saudi Arabia.[3,7] Is this a result of a lack of awareness among the treating dental physicians, the general population receiving the treatment, or both? To the best of our knowledge, there are still no studies in Saudi Arabia concerning the evaluation of the level of knowledge of dental professionals – who identify themselves as workers in the dental field – and the general population regarding the economic value of preventive dentistry. The aim of the study is to provide insight into the perception of the economic value of preventive dentistry and identify where the lack of knowledge is.

Materials and Methods

Ethical approval was obtained from the Research Ethics Committee at King Abdulaziz University, Faculty of Dentistry (062–16). An Arabic survey questionnaire was designed to assess the socioeconomic attributes as well as the respondents' dental health knowledge and awareness. The survey questionnaires were distributed through messaging platforms (WhatsApp, Telegram, and Facebook) and emails using Google Forms (Google LLC, Mountain View, CA, USA). To calculate the minimum sample size, the following parameters were followed: a margin of error of 5%, a confidence level of 95%, a population size of 1 million, and a response prevalence of 50%, indicating that knowledge has a normal distribution across the samples. The required ideal minimum sample size was devised to be 384 participants over the age of 18. Consent was implied by agreeing to complete the questionnaire. The survey questionnaire included the demographic characteristics of the respondents, such as their age, gender, and nationality, as well as their socioeconomic status, including their education level and residency. The survey primarily focused on the assessment of the relationship between the respondents' socioeconomic status and their awareness or knowledge on the importance of dental health care.

The results were analyzed using IBM Statistical Package for Social Sciences Version 23 (IBM Inc., Armonk, NY, USA). A simple descriptive statistic was used to define the characteristics of the study variables through the form of counts and percentages for the categorical and nominal variables whereas the continuous variables were presented by the mean and standard deviations. In this study, one domain was defined as "Knowledge" and was represented by the following seven questions:

- Do you know what fluoride is and how it is used?
- Do you know what a preventive filling is and how it is used?
- Do you know how much it will cost you to undergo fluoride treatment?
- Do you know how much it will cost you to have a preventive tooth filling?
- Do you know how much it will cost you to have tooth fillings?
- Do you know how much it will cost you to undergo root canal treatment?
- Do you know how much it will cost you to undergo prosthodontic treatment?

Reliability analysis was subsequently used to measure the scale and provide information about the relationship between the variables in the scale. Cronbach's alpha was used, which is a measure of internal consistency. The model describes how closely related a set of items are as a group. It is considered to be a measure of scale reliability or utilized to test the level of agreement based on the average correlation of the seven variables.

This domain was calculated by adding the variables to obtain a score between 0 and 7 and then converted to a 100-point scale, after which it was correlated to the demographics through the Chi-square test to determine a relationship between the categorical variables. To assess the relationship of more than two variables, an independent *t*-test and one-way analysis of variance test with the Least Significant Difference test as *post hoc* analysis were used. These tests were done with the assumption of normal distribution. Otherwise, if the two comparisons were not normally distributed, Welch's *t*-test was used as an alternative. A $P < 0.05$ was considered statistically significant.

Results

Table 1 illustrates the demographic characteristics of the respondents, with an initial total number of 393; however, after the exclusion of the individuals aged below 18, the total number of respondents was 375. This exclusion was considered since there was an implication that the individuals aged under 18 were dependent on their parents/guardians for their oral health matters. The demographic data revealed that the majority of the respondents (54.1%) were aged 20–30 years, followed by those aged 31–40 years (22.1%), then followed by the individuals aged 40 and above (18.9%), and then finally the individuals aged 18–20 years (4.8%). The data also showed that 66.4% of the respondents were female, and only 33.6% were male. Among all the respondents, 82.9% were Saudi nationals. More than half the respondents (58.9%) had attained their bachelor's degree, whereas 17.6% had attained a postgraduate degree. Only 5.9% of the respondents lived in a traditional house, whereas 58.7% lived in an apartment, and 35.5% resided in a villa. Of those, 53.6% owned their houses, and 46.4% rented their places.

The majority of the respondents earned 10,000 Saudi Arabian Riyals and below per month. With regards to health care, 62.1% availed their medical care in private hospitals, and 37.9% sought treatment in government hospitals. Only 32% visited dental clinics regularly, and almost the same percentage had health insurance. 79.7% of respondents had previously undergone dental scaling. The number of respondents who were employed was relatively equal to the number of unemployed, with 52.0% and 48.0%, respectively. Among the respondents who were employed, 46.7% were working in the dental field.

Table 1: Demographic structure and socioeconomic attributes of the survey respondents

Demography	Count	%
Age		
<20	18	4.8
20–30	203	54.1
31–40	83	22.1
Above 40	71	18.9
Gender		
Male	126	33.6
Female	249	66.4
Nationality		
Saudi	311	82.9
Non-Saudi	64	17.1
Education level		
Elementary level	9	2.4
Intermediate level	5	1.3
High school level	51	13.6
Diploma	23	6.1
Bachelor's degree	221	58.9
Postgraduate	66	17.6
Housing type		
Traditional house	22	5.9
Apartment	220	58.7
Villa	133	35.5
Housing ownership		
Own	201	53.6
Rent	174	46.4
Income		
<5000	136	36.3
5001–10000	96	25.6
10001–15000	54	14.4
More than 15001	89	23.7
Source of medical care		
Private	233	62.1
Governmental hospital	142	37.9
Regular dental visits		
Yes	120	32.0
No	255	68.0
Medical insurance		
Yes	140	37.3
No	235	62.7
Previous dental scaling		
Yes	299	79.7
No	76	20.3
Employment		
Employed	195	52.0
Unemployed	180	48.0
Place of employment		
In the dental field	91	46.7
Outside the dental field	104	53.3

Oral health knowledge was determined by evaluating the responses of the participants to the seven questions illustrated in Table 2. Results in the oral health knowledge assessment questions demonstrated that the majority of the respondents affirmed their knowledge on the use of fluoride, the purpose of preventive fillings, and the cost of tooth fillings, root canal treatment, and prosthodontic treatment. However, most of the respondents answered the contrary regarding the cost of fluoride treatment and preventive tooth fillings.

Table 2: Assessment of the respondents' knowledge on the economic value of dental services

Knowledge	Count	%
Do you know what fluoride is and how it is used?		
No	122	32.5
Yes	253	67.5
Do you know what a preventive filling is and how it is used?		
No	153	40.8
Yes	222	59.2
Do you know how much it will cost you to undergo fluoride treatment?		
No	282	75.2
Yes	93	24.8
Do you know how much it will cost you to have a preventive tooth filling?		
No	256	68.3
Yes	119	31.7
Do you know how much it will cost you to have tooth fillings?		
No	157	41.9
Yes	218	58.1
Do you know how much it will cost you to undergo root canal treatment?		
No	159	42.4
Yes	216	57.6
Do you know how much it will cost you to undergo prosthodontic treatment?		
No	168	44.8
Yes	207	55.2

Table 3: The respondents' oral and dental health outlook

Variables	Count	%
Losing teeth is one of the signs of aging.		
Strongly disagree	41	10.9
Disagree	158	42.1
Agree	138	36.8
Strongly agree	38	10.1
Having regular dental visits will help in keeping your teeth healthy.		
Strongly disagree	2	0.5
Disagree	2	0.5
Agree	95	25.3
Strongly agree	276	73.6
Maintaining dental health will result in a healthy body.		
Strongly disagree	4	1.1
Disagree	10	2.7
Agree	126	33.6
Strongly agree	235	62.7
Maintaining good oral health will save you money.		
Strongly disagree	7	1.9
Disagree	24	6.4
Agree	132	35.2
Strongly agree	212	56.5
Oral and dental care products are expensive.		
Strongly disagree	22	5.9
Disagree	100	26.7
Agree	170	45.3
Strongly agree	83	22.1
Regular dental visits save more money than visiting dentists only when needed.		
Strongly disagree	14	3.7
Disagree	55	14.7
Agree	142	37.9
Strongly agree	164	43.7

The assessment of the respondents' view on the importance of preventive dentistry was measured using the questions shown in Table 3. The majority of the respondents strongly agreed that "maintaining good oral health will save money." Nevertheless, 45.3% also agreed that "oral and dental care products are expensive." 43.7% of participants strongly agreed that "regular dental visits save more money than visiting dentists only when needed."

The reliability and relationships of the survey variables were analyzed using the Cronbach Alpha Model of Reliability. The assessment of the seven variables yielded Cronbach's alpha coefficient of 0.848. As such, the dental health knowledge domain was determined by the seven variables answerable by Yes or No and was quantified using the additive method. An answer of Yes incurred 1 point, whereas No equated to 0. Hence, a knowledge score of 0 denoted "No Dental Health Knowledge At All," whereas a score of 7 signified an "Exceptionally High Knowledge of Dental Health."

Table 4.1 highlights the knowledge percentage scores of the respondents in accordance with their demographic characteristics and socioeconomic status. There were no significant differences in knowledge scores with regard to age, gender, and nationality of the respondents ($P > 0.05$). Alternatively, there were statistically significant differences in knowledge scores based on education level, types of residency, and income ($P < 0.05$). There were no statistically significant differences in knowledge scores regarding current dental health status and field of work relevant to the sources of the respondents' medical care and health insurance availability ($P > 0.05$) [Table 4.2]. Moreover, statistically significant differences in knowledge scores were present with regards to the respondents' regular attendance to dental health clinics, whether they had undergone dental scaling before, and whether they were currently employed (at the time of the study) and, if so, if they worked in the dental field ($P < 0.05$).

To establish a relationship between the categorical variables, the Chi-square test was used to assess the attitudes of the respondents toward preventive dental care as per the respondents' education level [Table 5], income [Table 6], current employment status [Table 7], and association or involvement in the dental field [Table 8]. These four variables were chosen among the demographic and socioeconomic attributes since these elements can sufficiently represent the relationship

Table 4.1: Knowledge percentage scores of the respondents according to their demographic characteristics and socioeconomic status

Variables	Knowledge	*P*-value
Total	50.59±34.6	-
Age		
<20	30.16±29.4	0.078
20–30	51.23±33.4	
31–40	53.18±34.5	
Above 40	50.91±38.4	
Gender		
Male	52.49±38.3	0.450
Female	49.63±32.7	
Nationality		
Saudi	51.03±34.8	0.586
Non-Saudi	48.44±34.1	
Education level		
Below bachelor's degree	28.57±29.5	<0.001[a]
Bachelor's degree	53.20±32.3	
Postgraduate	71.21±33.0	
What type of house do you live in?		
Traditional house	26.62±29.0	0.002[a]
Apartment	50.45±34.0	
Villa	54.78±35.0	
Do you own/rent your house?		
Own	48.33±34.0	0.175
Rent	53.20±35.2	
Income		
<5000	38.97±31.2	<0.001[a]
5001–10000	43.90±33.4	
10001–15000	62.17±30.2	
More than 15001	68.54±34.4	

[a]-significant using one-way analysis of variance at *P*<0.05 level

Table 4.2: Knowledge percentage scores of the respondents according to their dental health status and field of work

Variables	Knowledge	*P*-value
Where do you get your medical care?		
Private	51.99±35.4	0.316
Governmental hospital	48.29±33.2	
Do you visit dental clinics regularly?		
Yes	65.48±32.5	<0.001[b]
No	43.59±33.4	
Do you have health insurance?		
Yes	51.02±35.9	0.853
No	50.33±33.9	
Did you undergo dental scaling before?		
Yes	54.71±33.7	<0.001[b]
No	34.40±33.6	
Do you have a job?		
Yes, I have a job	58.90±36.2	<0.001[b]
No, I don't have a job	41.59±30.5	
If you answered Yes with the previous question, what kind of job do you have?		
Yes, I am working in the dental field	80.38±26.4	<0.001[b]
No, I am not working in the dental field	40.11±33.0	

[b]-significant using independent t-test at *P*<0.05 level

of the respondents' economic status relevant to their attitude toward preventive dental care.

As for the respondents' attitude toward their dental health according to education level [Table 5], it was revealed that there was a statistically significant variation in opinion when asked "if losing teeth is a normal consequence of aging," and "if oral and dental care products are expensive" ($P < 0.05$). In addition, there was a statistically significant difference in opinion when asked "if maintaining good oral health will lead to better general health and save money" ($P < 0.05$), with the majority leaning toward agreement. However, there was no significant variation in opinions regarding "the importance of regular dental visits in keeping teeth healthy" and "if regular dental visits save more money than visiting dentists only when needed," as the results demonstrated clear agreement ($P > 0.05$).

The relationship between the respondents' income and their outlook on saving money through regular dental visits was also investigated. As shown in Table 6, there is a highly significant difference among all the income levels regarding their outlook on saving more money by regular dental visits compared to visiting dentists only when needed ($P < 0.05$). The table also illustrates the distribution of the respondents' outlook on preventive dental care, particularly concerning regular dental visits relevant to their income.

In the assessment of the employment status of the respondents and its relevance to their outlook on preventive dental care, most of the employed respondents affirm that maintaining good oral health saves more money than visiting dentists only when needed, as shown in Table 7. However, the opposite response was demonstrated among the unemployed portion of the respondents. There was no significant difference between the employed and unemployed respondents regarding their awareness on the cost of oral and dental care products ($P > 0.05$); meanwhile, there was a significant difference with regard to the maintenance of good oral health and regular dental visits saving more money ($P < 0.05$).

The employed portion of the respondents was further subdivided into two sections: whether the respondents were working in the dental field or not. A statistically significant difference was observed in the involvement of the respondents in the dental field regarding their attitude toward preventive dental care when compared to those not working in the dental field ($P < 0.05$). As observed in Table 8, all the last three variables incurred $P < 0.001$, indicating highly significant differences between dental health professionals and the general population.

Table 5: Chi-square test for attitude toward preventive dental care relevant to the respondents' education level

Variables	Total	Education level n(%)			*P*-value
		Below bachelor's degree (%)	Bachelor's degree (%)	Postgraduate (%)	
Total	375	88 (23.5)	221 (58.9)	66 (17.6)	-
Losing teeth is one of the signs of aging.					
Strongly disagree	41	2 (4.9)	22 (53.7)	17 (41.5)	<0.001[a]
Disagree	158	27 (17.1)	101 (63.9)	30 (19.0)	
Agree	138	48 (34.8)	80 (58.0)	10 (7.2)	
Strongly agree	38	11 (28.9)	18 (47.4)	9 (23.7)	
Having regular dental visits will help in keeping your teeth healthy.					
Strongly disagree	2	0 (0.0)	1 (50.0)	1 (50.0)	0.109
Disagree	2	1 (50.0)	1 (50.0)	0 (0.0)	
Agree	95	32 (33.7)	47 (49.5)	16 (16.8)	
Strongly agree	276	55 (19.9)	172 (62.3)	49 (17.8)	
Maintaining dental health will result in a healthy body.					
Strongly disagree	4	1 (25.0)	2 (50.0)	1 (25.0)	0.018[a]
Disagree	10	3 (30.0)	7 (70.0)	0 (0.0)	
Agree	126	43 (34.1)	62 (49.2)	21 (16.7)	
Strongly agree	235	41 (17.4)	150 (63.8)	44 (18.7)	
Maintaining good oral health will save you money.					
Strongly disagree	7	4 (57.1)	2 (28.6)	1 (14.3)	0.006[a]
Disagree	24	9 (37.5)	15 (62.5)	0 (0.0)	
Agree	132	38 (28.8)	74 (56.1)	20 (15.2)	
Strongly agree	212	37 (17.5)	130 (61.3)	45 (21.2)	
Oral and dental care products are expensive.					
Strongly disagree	22	2 (9.1)	12 (54.5)	8 (36.4)	0.019[a]
Disagree	100	21 (21.0)	57 (57.0)	22 (22.0)	
Agree	170	45 (26.5)	95 (55.9)	30 (17.6)	
Strongly agree	83	20 (24.1)	57 (68.7)	6 (7.2)	
Regular dental visits save more money than visiting dentists only when needed.					
Strongly disagree	14	4 (28.6)	9 (64.3)	1 (7.1)	0.135
Disagree	55	16 (29.1)	33 (60.0)	6 (10.9)	
Agree	142	37 (26.1)	85 (59.9)	20 (14.1)	
Strongly agree	164	31 (18.9)	94 (57.3)	39 (23.8)	

[a]-significant using the Chi-square test at $P<0.05$ level

Discussion

Among the literature, limited attention has been given to the assessment of the level of awareness regarding the economic value of preventive dentistry, specifically between dental professionals and the general population. The methodological strength of this study stems from being the first of its kind conducted in Saudi Arabia, with an appropriate sample size and diverse perspectives. The level of awareness regarding the economic value of preventive dentistry was described by defining "knowledge" as a collective concept of awareness.[22] The knowledge scores with respect to age, gender, and nationality presented no statistically significant differences among the variables, whereas the education levels, types of residency, and income were found to have statistically significant differences. These factors more likely affected the level of knowledge of the respondents regarding preventive dentistry. The respondents' employment status and their involvement in the dental field also yielded highly significant differences in knowledge scores. These were the main factors considered in gauging the differences in the level of awareness of the economic value of preventive dentistry between dental professionals and the general population.

The knowledge scores of the respondents with respect to their education level yielded exceptionally high scores with the individuals who had attained a bachelor's degree and a postgraduate degree. This result is expected, as educated individuals have access to information through resources and surrounding colleagues and are more likely to have greater experience and knowledge on the costs of dental services. Trohel *et al*. showed that dental care needs decrease with the increase in socioeconomic level and educational levels.[23] Similarly, the respondents with higher incomes also incurred higher knowledge scores. It is a common trend to see those with higher earnings to more frequently employ dental services.[11,23,24] Out of the employed individuals earning income, the respondents working in the dental

Table 6: Chi-square test for attitude toward preventive dental care relevant to the respondents' income

Variables	Total	Income *n* (%)				*P*-value
		<5000 (%)	5001–10000 (%)	10001–15000 (%)	More than 15001 (%)	
Total	375	136 (36.3)	96 (25.6)	54 (14.4)	89 (23.7)	-
Losing teeth is one of the signs of aging.						
Strongly disagree	41	11 (26.8)	3 (7.3)	7 (17.1)	20 (48.8)	<0.001[a]
Disagree	158	54 (34.2)	39 (24.7)	25 (15.8)	40 (25.3)	
Agree	138	58 (42.0)	42 (30.4)	20 (14.5)	18 (13.0)	
Strongly agree	38	13 (34.2)	12 (31.6)	2 (5.3)	11 (28.9)	
Having regular dental visits will help in keeping your teeth healthy.						
Strongly disagree	2	0 (0.0)	1 (50.0)	0 (0.0)	1 (50.0)	0.566
Disagree	2	1 (50.0)	1 (50.0)	0 (0.0)	0 (0.0)	
Agree	95	41 (43.2)	25 (26.3)	13 (13.7)	16 (16.8)	
Strongly agree	276	94 (34.1)	69 (25.0)	41 (14.9)	72 (26.1)	
Maintaining dental health will result in a healthy body.						
Strongly disagree	4	2 (50.0)	1 (25.0)	0 (0.0)	1 (25.0)	0.212
Disagree	10	5 (50.0)	4 (40.0)	1 (10.0)	0 (0.0)	
Agree	126	56 (44.4)	24 (19.0)	17 (13.5)	29 (23.0)	
Strongly agree	235	73 (31.1)	67 (28.5)	36 (15.3)	59 (25.1)	
Maintaining good oral health will save you money.						
Strongly disagree	7	2 (28.6)	4 (57.1)	0 (0.0)	1 (14.3)	0.033[a]
Disagree	24	12 (50.0)	8 (33.3)	3 (12.5)	1 (4.2)	
Agree	132	55 (41.7)	36 (27.3)	16 (12.1)	25 (18.9)	
Strongly agree	212	67 (31.6)	48 (22.6)	35 (16.5)	62 (29.2)	
Oral and dental care products are expensive.						
Strongly disagree	22	7 (31.8)	3 (13.6)	2 (9.1)	10 (45.5)	0.033[a]
Disagree	100	42 (42.0)	21 (21.0)	10 (10.0)	27 (27.0)	
Agree	170	56 (32.9)	47 (27.6)	25 (14.7)	42 (24.7)	
Strongly agree	83	31 (37.3)	25 (30.1)	17 (20.5)	10 (12.0)	
Regular dental visits save more money than visiting dentists only when needed.						
Strongly disagree	14	2 (14.3)	4 (28.6)	6 (42.9)	2 (14.3)	<0.001[a]
Disagree	55	23 (41.8)	19 (34.5)	6 (10.9)	7 (12.7)	
Agree	142	65 (45.8)	33 (23.2)	19 (13.4)	25 (17.6)	
Strongly agree	164	46 (28.0)	40 (24.4)	23 (14.0)	55 (33.5)	

[a]-significant using the Chi-square test at $P < 0.05$ level

field were expected to have high knowledge scores, and the results confirm this expectation.[2]

To correlate the participants' level of knowledge with their outlook toward preventive dental care, the respondents' attitude was assessed relative to their education level, income, employment status, and their involvement in the dental field. Most of the individuals of all education levels agree that maintaining good oral health will save money, and also concur that dental care services are expensive. However, there was variation in responses regarding whether regular dental visits save more money compared to visiting dentists only when needed – interestingly, several respondents with and without a bachelor's degree disagreed with this opinion. This signifies that they had the knowledge of good oral hygiene maintenance and the cost of dental care services, but they did not necessarily prioritize the preventive aspect of their dental health through regular dental visits. This is in line with a study by Echeverria *et al*. in which university students reported utilizing dental services more to solve pressing oral issues and not regularly to prevent them.[25]

There was a highly significant difference among all the income levels regarding the respondents' outlook on saving more money by regular dental visits compared to visiting dentists only when needed. The respondents' earning high wages were more likely to agree that visiting the dentist regularly saves more money than when visiting only when needed. This finding is corroborated by several studies in which those from higher income or high socioeconomic backgrounds utilized preventive dental care and saved future costs.[12,18,26] Okunev *et al*. reported that prior preventive dental care was the most influential factor in lowering the probability of undergoing future surgical treatment.[18] Furthermore, Peltzer and Pengpid investigated the oral health behavior of university students from distinct socioeconomic backgrounds and similarly determined low rates of dental attendance among university students from different cultures across Africa, Asia, and the Americas.

Table 7: Chi-square test for attitude toward preventive dental care relevant to the respondents employment status

Variables	Total	Do you have a job? *n* (%)		*P*-value
		Yes, I have a job	No, I don't have a job	
Total	375	195 (52.0)	180 (48.0)	-
Losing teeth is one of the signs of aging.				
Strongly disagree	41	20 (48.8)	21 (51.2)	0.455
Disagree	158	86 (54.4)	72 (45.6)	
Agree	138	66 (47.8)	72 (52.2)	
Strongly agree	38	23 (60.5)	15 (39.5)	
Having regular dental visits will help in keeping your teeth healthy.				
Strongly disagree	2	1 (50.0)	1 (50.0)	0.459
Disagree	2	0 (0.0)	2 (100.0)	
Agree	95	47 (49.5)	48 (50.5)	
Strongly agree	276	147 (53.3)	129 (46.7)	
Maintaining dental health will result in a healthy body.				
Strongly disagree	4	2 (50.0)	2 (50.0)	0.122
Disagree	10	2 (20.0)	8 (80.0)	
Agree	126	61 (48.4)	65 (51.6)	
Strongly agree	235	130 (55.3)	105 (44.7)	
Maintaining good oral health will save you money.				
Strongly disagree	7	5 (71.4)	2 (28.6)	0.039[a]
Disagree	24	8 (33.3)	16 (66.7)	
Agree	132	61 (46.2)	71 (53.8)	
Strongly agree	212	121 (57.1)	91 (42.9)	
Oral and dental care products are expensive.				
Strongly disagree	22	11 (50.0)	11 (50.0)	0.409
Disagree	100	45 (45.0)	55 (55.0)	
Agree	170	93 (54.7)	77 (45.3)	
Strongly agree	83	46 (55.4)	37 (44.6)	
Regular dental visits save more money than visiting dentists only when needed.				
Strongly disagree	14	4 (28.6)	10 (71.4)	0.026[a]
Disagree	55	24 (43.6)	31 (56.4)	
Agree	142	69 (48.6)	73 (51.4)	
Strongly agree	164	98 (59.8)	66 (40.2)	

[a]-significant using the Chi-square test at $P<0.05$ level

In those from low-income backgrounds, basic life necessities were of greater priority than eliminating the risks of dental health problems.[27]

The results pertaining to the respondents' employment status were similar – the employed individuals believed that regular dental check-ups are more practical. The dental health professionals highly affirmed that maintaining good oral health will save money, that oral and dental care products are expensive, and that regular dental visits save more money than visiting dentists only when needed. There were highly significant differences between those in the dental field and those who were not, yielding $P < 0.001$ on all three mentioned variables. This is expected, as those in the dental field will have first-hand knowledge and experience on the practicalities of oral health. This is similar to the results presented by Wagle *et al*., comparing behaviors of those in the dental field with those who are not.[28] It is imperative that oral health-care providers and personnel are well-informed on preventive measures to efficiently encourage people to implement healthy lifestyles, including good maintenance of dental health through regular dental check-ups instead of adopting problem-oriented dental visits.[2,8]

The relationship between health-related attitudes, opinions, and perspectives is profoundly complex. There are numerous factors that influence an individual's awareness and outlook toward preventive dental care including beliefs, values, skills, attitudes, finances, experiences, and interactions with those within the individual's environment. This study demonstrated a high level of awareness of the economic value of preventive dental care; however, implementation of that knowledge and attitude toward preventive dental care remains unsatisfactory. A recent study on oral hygiene measures in Saudi Arabia also showed a similar discrepancy; secondary school children were reported to be well aware of the importance of good oral hygiene practices but were inconsistently fulfilling these practices.[29]

The present study illustrates the relationship between the respondents' socioeconomic status and their

Table 8: Chi-square test for attitude toward preventive dental care relevant to the respondents' association in the dental field

Variables	Total	If you answered Yes to the previous question, what kind of job do you have? *n* (%)		*P*-value
		Yes, I am working in the dental field	No, I am not working in the dental field	
Total	195	91 (46.7)	104 (53.3)	-
Losing teeth is one of the signs of aging.				
Strongly disagree	20	20 (100.0)	0 (0.0)	<0.001[a]
Disagree	86	49 (57.0)	37 (43.0)	
Agree	66	14 (21.2)	52 (78.8)	
Strongly Agree	23	8 (34.8)	15 (65.2)	
Having regular dental visits will help in keeping your teeth healthy.				
Strongly disagree	1	1 (100.0)	0 (0.0)	0.041[a]
Disagree	0	0 (0.0)	0 (0.0)	
Agree	47	15 (31.9)	32 (68.1)	
Strongly Agree	147	75 (51.0)	72 (49.0)	
Maintaining dental health will result in a healthy body.				
Strongly disagree	2	1 (50.0)	1 (50.0)	0.372
Disagree	2	0 (0.0)	2 (100.0)	
Agree	61	25 (41.0)	36 (59.0)	
Strongly Agree	130	65 (50.0)	65 (50.0)	
Maintaining good oral health will save you money.				
Strongly disagree	5	1 (20.0)	4 (80.0)	<0.001[a]
Disagree	8	0 (0.0)	8 (100.0)	
Agree	61	20 (32.8)	41 (67.2)	
Strongly Agree	121	70 (57.9)	51 (42.1)	
Oral and dental care products are expensive.				
Strongly disagree	11	10 (90.9)	1 (9.1)	<0.001[a]
Disagree	45	25 (55.6)	20 (44.4)	
Agree	93	45 (48.4)	48 (51.6)	
Strongly Agree	46	11 (23.9)	35 (76.1)	
Regular dental visits save more money than visiting dentists only when needed.				
Strongly disagree	4	1 (25.0)	3 (75.0)	<0.001[a]
Disagree	24	5 (20.8)	19 (79.2)	
Agree	69	24 (34.8)	45 (65.2)	
Strongly Agree	98	61 (62.2)	37 (37.8)	

[a]-significant using the Chi-square test $P < 0.05$ level

knowledge and attitude on the economic cost of preventive health care. Other studies have also reported that with an increased level of education, the level of awareness increased. Al Mejmaj *et al*. explored the factors that affect awareness of the importance of preventive dentistry in the Buraidah region of Saudi Arabia. They found that the level of education is directly related to the level of awareness.[30] Despite the limited availability of the results, such data have been beneficial in organizing preventive oral health education programs targeted toward health professionals.[2,19] With a more accurately assessed awareness of oral health knowledge and its economic value, the knowledgeable perspectives of health professionals can be used for community oral health educational and instructional programs concerning the economic benefits of preventive oral and dental health care.

Despite the ingenuity of the study, the limitations include the lack of a standard questionnaire for assessing oral health knowledge, attitude, and practices. Moreover, there is a scarcity of data from other countries regarding the awareness of the economic value of preventive dentistry, specifically when comparing dental and non-dental professionals. Due to this fact, a more comprehensive comparison cannot be drawn between the statuses of the awareness in the economic value of preventive dental care in Saudi Arabia as compared to other countries. A more representative database should be generated and made accessible, particularly one that is less subjective so that the assessment of oral health of various health professionals can be standardized. For this, a more thorough investigation can be planned with a precise focus on the parameters that could influence the distinctive attitudes of dental health professionals and the general population.

Conclusion

The findings of the study demonstrated that with higher income, higher education level, and stable

employment status, there is also a higher level of awareness or knowledge regarding the economic value of preventive dentistry. Most of the respondents were also knowledgeable regarding the economic benefits of maintaining good oral and dental care compared to utilizing dental services only when needed. However, the conflict extended from the application of this knowledge to their lifestyles. Dental health practitioners are expected to be the most knowledgeable. As such, it is the dental health professionals' responsibility to promote the application of this awareness and knowledge to the general populations' real lives. Dental health professionals should be more proactive as they bear the responsibility for the development and deployment of programs that will reinforce the economic benefits of preventive dentistry.

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Data Availability Statement

Data are available from the author upon reasonable request.

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Conflicts of Interest

The authors declare no conflict of interest.

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