

Stages of dental cleaning behavior change and its relationship with fear of dental care in employees of healthcare centers in Iran

- 1- Nematshahrbabaki Babak, Ms Health Service Management, health center of Sanandaj, Kurdistan University of Medical Sciences, Sanandaj, Iran
- 2- Fallahi Arezoo, Assistant professor, Department of public health, School of Health, Kurdistan University of Medical Sciences, Sanandaj, Iran-Corresponding author.
- 3- Shahmoradi Behzad, Assistant Professor, Environmental Health Research Center, Deputy of Education, Faculty of Health, Kurdistan University of Medical Sciences.
- 4- Lotfollah Asrin, Master of health education, Student Research Committee, Kurdistan University of Medical Sciences, Sanandaj, Iran.
- 5- Shahsavari Sirous, Instructor, Department of public health, School of Health, Kurdistan University of Medical Sciences, Sanandaj, Iran.
- 6- Salvati Shokriye, Expert of public health, Department of public health, School of Health, Kurdistan University of Medical Sciences, Sanandaj, Iran.

Abstract

Context: Employees of healthcare centers play vital role in delivering primary health care to populations.

Aim: The aim of this study was to assess stages of dental cleaning behavior change and its relationship with fear of dental care in employees of healthcare centers in Iran.

Settings and Design: This cross-sectional study was carried out in Sanandaj City, Iran.

Methods and Materials: To achieve the above-mentioned objectives, census method was employed to recruit 212 employees from 23 healthcare centers. The study was conducted in 2015. Inclusion criteria were willingness to participate in the study and having work experience more than 5 years in healthcare centers. Fear of dental care and the constructs of trans-theoretical model, and tool with proven reliability and validity were used.

Statistical analysis: The statistical analysis of the data included descriptive statistics, *t*-test, correlation coefficient, and ANOVA.

Results: Out of 212 employees, 69.8% were in the maintenance stage. There was a significant difference in self-efficacy and fear of dental care by stages of dental cleaning behavior ($P=0.01$ and 0.001). Mean score of fear of dental care was higher in pre-contemplation and contemplation stage. A positive and significant relationship was found between self-efficacy and perceived benefits. Moreover, a negative and significant correlation was observed between perceived barriers and fear of dental care with self-efficacy.

Conclusion: This research revealed that trans-theoretical model is useful in determining the stages of dental cleaning behavior among healthcare employees. It is crucial to develop some tailor-made counseling strategies for coping with fear of dental care among healthcare employees.

Key words: dental health, employees, healthcare centers.

Key Messages: caring out self-care behaviors among healthcare employees could be attributed to their economic, social, and cultural status. Nevertheless, employees' self-confidence in doing oral health behaviors and way of handling the stress should be more considered.

Introduction

Dental health is one of the main components of public health. Having healthy teeth not only helps the person in eating and speaking without any problems but also increase self-confidence.⁽¹⁾ Tooth decay is rapidly decreasing in developed countries, while it is becoming epidemic diseases in developing countries.⁽²⁾ The results of a study in Iran showed that decayed, missing, and filled teeth (DMFT) index among 12 years old children is about 2.46%.⁽³⁾ Although healthy oral can increase person's self-efficacy, communication, and prevent diseases,⁽⁶⁻⁵⁾ the level of dental self-care behaviors is unsatisfactory.⁽⁷⁾

Self-care behaviors are the most important tools for preventing dental diseases.⁽⁴⁾ One of major factors shaping oral health behaviors is instructions presented by healthcare team.⁽⁵⁾ This team

has a population of nearly 35 million throughout the world.⁽⁶⁾ They are in direct communication with people and play vital role in delivering primary healthcare to populations.⁽¹⁰⁾ People not only trust them but also accept their behaviors as patterns of healthcare.^(11,12) One of these preventive behaviors is dental health behaviors.⁽⁷⁾ Studies have indicated that health care employees' regular and healthy teeth not only increase performing dental health behaviors among people but also enhance the effect of educational interventions on oral health behaviors.^(14,10) Multifactorial elements such as fear of care, self-confidence,⁽⁸⁾ benefits, and perceived barriers impact on dental self-care behaviors.⁽⁹⁻¹⁰⁾ Dental fear seems to arise during childhood in most cases and continue in adolescents and adults. It impacts the regular dental attendance, dental treatment, and individuals' quality of life and work.⁽¹¹⁻¹³⁾

It has not been reported any case of dental self-care behaviors such as regular examination and using tooth brush, tooth pick, and tooth floss among healthcare employees. In addition, there is no study on identifying stages of dental cleaning behavior change based on the behavior change models as trans-theoretical model (TTM) among employees. Moreover, research works conducted have not yet reported relationship between fear of dental care and stages of dental cleaning behavior change among healthcare employees.

TTM planned by Prochaska and Diclemente indicates that process of behavior change consists of stages of behavior change (pre contemplation, contemplation, preparation, action, maintenance), self-efficacy, perceived benefits, perceived barriers, and changing process.^(5, 14) Although TTM has been utilized in numerous studies, the implementation on employees, especially healthcare employees, to evaluate interdental cleaning behavior changes in developing countries, has not been surveyed. Therefore, the purpose of this study was investigation of stages of dental cleaning behavior change and their relationship with fear of dental care in employees of healthcare centers in Iran. Study hypotheses were:

Fear of dental care is less in higher stages of dental care behavior.

Self-efficacy and perceived benefit is more in maintenance stage than other stages

There is a relationship between fear of dental care and the stages of dental cleaning behavior change based on TTM.

Methods

This work was supported by the Vice Chancellor for Research and Technology, Kurdistan University of Medical Sciences, Sanandaj, Iran under ethical code MUK.REC.1394. 328. This cross-sectional study was conducted in Sanandaj City, Iran. Employees were recruited from 23 healthcare centers. Employees meeting the inclusion criteria for the study completed questionnaire. All respondents were told about the confidentiality of the results and all of them signed consent form. Scales of stages of behavior change, perceived self-efficacy, perceived benefit, perceived barrier, and fear of dental care were employed. Statistical Package for Social Sciences (SPSS, Ver. 17) was used for data analysis. Period of recruitment was five months from January 1, 2016 to May 10, 2016.

Ethical considerations

Before initiating the study, the staff and managers of healthcare centers and participants were briefed regarding the aims of this research work. Each employee signed the consent form and participated in the study voluntarily. The participants were informed about confidentiality of information and results and were given a text about benefits of dental cleaning behaviors and its effects on general health of body.

Sample

Census method was employed to recruit 212 employees from the healthcare centers (23 centers) in Sanandaj City, west of Iran in 2016. An inclusion criterion was having work experience more than 5 years in healthcare centers. An exclusion criterion was lack of education experiences in oral health to people referring to health centers. The questionnaire was distributed among interested employees to participate in the study. Among the participants, only one person did not fill out the questionnaire because he was not interested in participating in the study.

Tools

The fear of dental care (7 items, range 7-35, 5 point Likert scale) was measured using a scale with proven reliability (0.84) and validity (0.81).⁽¹⁵⁾ The TTM variables were perceived benefits (8 items range 8-40, 5 point Likert scale, reliability 0.86 and validity 0.81), perceived barriers (10 items, range 10-50, 5 point Likert scale, reliability 0.78 and validity 0.82), and self-efficacy (10 items range 10-40, 4 point Likert scale, reliability 0.84 and validity 0.84). Reliability and validity of these scales had been confirmed by Iranian researchers.⁽¹⁰⁾ Table 1 presents the stages of dental cleaning behavior change recognized using a four items tool designed by Tillis et al (2003). The Kappa coefficients for the validity of the 4 questions were 0.75, 0.78, 0.45, and 0.75.⁽¹⁶⁾

Statistical analysis

First the normality of data was confirmed, making it possible to use parametric tests. Data were analyzed using SPSS (Ver. 17.0) software. Descriptive statistics were employed to explain the basic features of the data in the study. Several types of statistical tests, such as Spearman's correlation, *t*-test, and ANOVA with Tukey's post-hoc were used.

Results

The mean age for the sample was 38.64 ± 8.73 years old. The sample contained 47 male (22.2%) and 165 female (77.8%). The qualification of participants was as 9% Diploma, 23.1% Associate degree, 48.6% Bachelor of Science, 7.5% Master of Science, and 8.5% doctorate.

The prevalence of dental cleaning behavior among the employees was as follows: dental flossing 8.5% (18 persons), toothpick 0.5% (1), toothbrush 8.9% (40), toothpick and using toothbrush together 6.2% (15), dental floss and toothbrush 46.5% (105), toothbrush, dental floss, and toothpick together 14.6% (31), and none 4.7% (2).

Out of the 212 participants, 4.7% were in the pre-contemplation stage of dental cleaning behavior, while 69.8% were in the maintenance, and the rest distributed among the other stages (Table 2).

The mean score of fear of dental care in the respondents was 11.83 ± 5.2 . Statistically significant differences were observed between self-efficacy and fear of dental with sex ($P= 0.001$ and $P=0.02$ respectively).

Mean scores of Trans-theoretical constructs and fear of dental care by demographic variables are shown in Table 3. There was a significant difference in self-efficacy and fear of dental care by stages of dental cleaning behavior.

Mean and standard deviation of trans-theoretical variables and fear of dental care by stage of dental cleaning behavior are presented in Table 4. Tukey's post-hoc test showed that the mean score of fear of dental care among employees who were in pre-contemplation and contemplation stage was significantly higher than those in other stages. Those who were in the maintenance and action stages revealed a higher level of self-efficacy than those who were in pre-contemplation and contemplation stages.

The results of Spearman correlation coefficient test indicated that there was a positive and significant relationship between self-efficacy with perceived benefits. Moreover, a negative and

significant correlation between perceived barriers with fear of dental care was observed. Table 5 tabulates the relationship between determinants of dental health behaviors based on TTM and fear of dental care.

Discussion

To our best knowledge, this is the first study reporting dental cleaning behavior change based on TTM and fear of dental care among Iranian employees in healthcare centers.

The study revealed that a very small percentage of the sample was in the contemplation and pre-contemplation stage. However, 69.8% of subjects were in the maintenance stage, which is higher than those found in other studies.^(10, 16-18) Most of the employees used dental cleaning device. A high level use of the devices and oral health behaviors may result in increasing the employees' knowledge, attitude, and degree of commitment to a behavior. Some studies have reported that commitment is a crucial factor for reducing disease. Persons at higher stage of behavior change have higher commitment of time and energy compared with those at the lower stage.^(9-10, 19)

It is noteworthy that self-care behaviors among healthcare employees could also be attributed to their economic, social, and cultural status because dental self-care behaviors were affected by these factors.⁽¹⁸⁾ This study indicated that low percentage of respondents were in the pre-contemplation, contemplation, and preparation stages. This finding means that 14.6% of healthcare employees did not use dental cleaning devices and did not perform self-care behaviors. In line with our findings, the studies carried out based on TTM showed that persons, who are at low stage of behavior change have low self-efficacy and perceived benefits and high perceived barriers.^(10, 20-21) Other studies reported that self-efficacy is a valuable determinant for adopting specific behaviors.^(10, 22) Increasing self-efficacy and perceived benefits of dental health can prompt dental cleaning behaviors and improve stages of behavior change among employees. Healthcare employees as patterns and promoters of health behaviors should pay attention to

dental health behaviors, overcome on barriers, and enhance their self-confidence of practicing behaviors.

The mean score of fear of dental care in the respondents was 11.83 ± 5.2 . With increasing stages of dental cleaning behavior, fear of dental care reduced but at final stages, the mean score of fear of dental care was unchanged and approximately fixed. This study indicated that most of the employees despite their fear, perform dental health behaviors. It has been reported that dental fear often initiates during childhood and continues in adolescents and adults. It has impact on regular dental healthcare, individuals' quality of life and work. ⁽¹¹⁻¹³⁾

The results of the studies show that employees' self-confidence in doing oral health behaviors, their views of fear of dental care, and way of handling the stress need to be more investigated.

Any conclusion about the result of the present study must be considered in light of the study limitations. These limitations were lack of long-term follow up, use of descriptive method, use of a self-reporting tool, restriction to one population group, and lack of valid dental health index. More studies are required in field of dental cleaning behaviors among different groups of employees and in larger populations through qualitative and quantitative methods. Moreover, further studies are needed to explore causes, consequences, and strategies for overcoming fear of dental care of employees' perspective via deep and semi-structure interviews.

The TTM as a framework for understanding the determinants of dental cleaning behavior is useful to design interventional educational programs. Policy makers, dentists, and employees in health-care centers can employ the findings of this research. These results can be useful in treatment decision making, consulting, and designing the interventional programs related to dental health (with increasing perceived self-efficacy, benefits, reducing fear of dental care, and perceived barriers). It is necessary to develop some tailor-made counseling strategies for coping with fear of dental care among health care employees.

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Table 1 Key for determining stage of change based on responses to the stages of change instrument (Tillis et al, 2003)

Questions	1. How frequently do you clean between your teeth?	2. How long have you been cleaning between your teeth at your current frequency?	3. In the next 30 days, do you plan to clean between your teeth...	4. In the next 6 months do you think you might clean between your teeth...
Stage				
Pre-contemplation	< 3 times/week		About the same or less often	About the same or less often
Contemplation	< 3 times/week			More often
Preparation	< 3 times/week		More often	
Action	3 or more times/week	< 6 months		
Maintenance	3 or more times/week	6 months or more		

Table 2 stage of dental cleaning behavior

Stage of change	Frequency	Percent
Pre-contemplation	10	4.7
Contemplation	7	3.3
Preparation	14	6.6
Action	33	15.6
Maintenance	148	69.8

Table 3 Relationship between demographic variables with determinants dental health behavior based on TTM and plaque index in students

Means of determinants		Self-efficacy	Perceived benefits	Perceived barriers	Decisional balance	Fear of dental care
Demographic Variables						
Sex	Male	32.12	26.78	18.91	7.87	10.95
	Female	33.89	27.41	17.86	9.55	12.08
	<i>P-Value</i>	0.001	0.24	0.16	0.76	0.02
Income	Low	31.57	27.02	18.83	8.18	12.04
	Average	34.28	27.19	18.31	8.87	11.72
	Good	33.2	27.85	16.92	10.92	11.85
	Excellent	35.71	27	15.85	11.14	12.14
	<i>P-Value</i>	0.17	0.79	0.05	0.2	0.98
Oral Health Assessment	Excellent	41	28.4	17.6	10.8	9.8
	Good	33.64	27.17	17.15	10.02	11.05
	average	33.1	27.32	18.83	8.48	12.83
	Bad	33.53	28.69	18.15	10.53	10.38
	Very bad	23.8	22	20.2	1.8	13.00
	<i>P-Value</i>	0.001	0.03	0.4	0.04	0.07
Frequency of Dental Visits	Once During Month	38.66	5.19	18.00	11.00	9.33
	Once During Three Months	33.25	4.03	19.25	8.00	13.00
	Once During Six Months	33.94	4.54	18.23	8.81	10.15
	Once During Year	34.87	3.63	17.34	10.46	11.72
	<i>P-Value</i>	0.08	0.55	.035	0.28	0.12
Reasons of Dental Visits	Just To Check	26.50	25.80	20.10	5.70	16.50
	Dental Pain	27.28	27.71	16.57	11.14	15.57

	Tooth Decay And Bleeding Gums	31.92	27.21	19.21	8.00	11.64
	Orthodontics	31.18	26.15	18.93	7.21	11.93
	P-Value	0.001	0.32	0.12	0.8	0.01

Table 4 Mean and SD of Trans-Theoretical variables and fear of dental care by stage of dental cleaning behavior

Stage of change	Self-efficacy		Perceived benefits		Perceived barriers		Decisional balance		Fear of dental care	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pre-contemplation	26.5	9.2	25.8	5.49	20.1	3.95	5.7	6.84	16.5	10.39
Contemplation	27.28	12.07	27.71	5.05	16.57	1.98	11.14	6.28	15.57	10.67
Preparation	31.92	9.27	27.21	3.98	19.21	4.69	8	8.09	11.64	3.27
Action	31.18	6.42	26.15	4.14	18.93	3.42	7.21	6.48	11.93	5.18
Maintenance	34.93	6.96	27.6	4.01	17.73	4.11	9.87	6.59	11.33	4.29
p-value	0.001		0.32		0.12		0.89		0.01	

Table 5 Relationship between determinants of dental health behaviors based on TTM and fear of dental care

Variables	Self-efficacy	Perceived benefits	Perceived barriers	Decisional balance	Fear of dental care
Self-efficacy	1				
Perceived benefits	.249**	1			
Perceived barriers	-.367**	-.361**	1		
Decisional balance	.372**	.831**	-.819**	1	
Fear of dental care	-.181**	-.196**	.297**	.298**	1

**p<0.05 (two-tailed)