Impact of Peridontitis Education Program on Peridontitis Patients' Knowledge, Beliefs, and behavior in Riyadh City

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Abstract: An intervention experimental study was conducted to assess the impact of Peridontitis education program (PEP) for Peridontitis patients in King Abdel Aziz University Hospital (KAAUH) in Riyadh City. The program was administered to 103 patients through one session and one immediate assessment. Another 103 patients formed the control group. The results showed that the mean knowledge score, the mean scores of the perceived seriousness (p. seriousness), p. benefits, and p. barriers of intervention group were significantly higher than the control group. Stepwise multiple regression models revealed that total knowledge, perceived benefits, patients' work, and family size were predictors of patients' practice of control group (β=0.287, 0.218, 0.194, and 0.192). Total knowledge, patients' work and total health beliefs model (HBM) score were predictors of patients' practice of the intervention group (R²=0.303). The study recommended the replication of such program and a more long term one to have more improvement in patients' knowledge, all beliefs, and practice.

Keywords; Peridontitis Education Program (PEP); Peridontitis Knowledge; Beliefs and Practices (KPP; Oral Hygiene)

INTRODUCTION

Oral diseases are clearly related to behavior, and the prevalence of dental caries and periodontal disease has decreased with improvement in the oral hygiene and the decrease in the consumption of sugar product. This general favorable trend in reducing oral diseases, however, has not been seen in several developing countries or in the Middle East.[1,2] While twice-a-day tooth brushing seems to be an established practice in several industrialized countries such as United Kingdom,[3] Italy,[4] Sweden,[5] and Norway,[6] this goal is still far from being realized in several other countries, including

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Saudi Arabia,[1] Turkey,[7] Lebanon,[8] and Kuwait.[9,10]

In parallel to changing oral disease patterns, oral health awareness, dental knowledge, and positive dental health attitudes of the general public have grown.[11-14] Oral health knowledge is considered to be an essential prerequisite for health related behavior,[15] although only a weak association seems to exist between knowledge and behavior in cross-sectional studies.[16,17] Nevertheless, studies have shown that there is an association between increased knowledge and better oral health.[18,19]

The health belief model (HBM), is one of the first models to adapt theories from the behavioral sciences in order to examine health-related problems. It is still one of the most widely recognized and used models in health behavior applications.[20] The four constructs of the model are perceived susceptibility, perceived seriousness, perceived benefits of taking

action, and perceived barriers to taking action. [20]

There is a need for studies assessing changes in knowledge, beliefs, and practice of Saudi patients having peridontitis following the implementation of Peridontitis education program (PEP). Therefore, this study aimed at assessing the impact of short-term PEP for patients having the disease. The PEP aims at increasing patients' knowledge, improving beliefs to compliance with treatment and healthy practices and increasing compliance, and inducing positive behavior changes.

MATERIAL and METHODS:

Study design, settings, and population: The study population was the outpatients having peridontitis at King Abdel Aziz University Hospital (KAAUH) and agreed to participate in the study. Two hundred and six patients: 103 patients were subjected for PHE intervention and the other 103 were controls. The control group patients were interviewed first to prevent information pollution. At each working day,

a group of patients of the intervention group having peridontitis who agreed to participate were collected in a staff room to attend the session. Each group number ranged from 8-12. Ten groups were subjected to PEP. Each session of the program took about 2 hours for each group. The patients of the intervention group were interviewed by the questionnaire immediately after the session.

Peridontitis Education Program (PEP):

The objectives of PEP were encouraging the improvement in compliance with treatment recommendations. This improvement in compliance could be happened by increasing knowledge and improving beliefs.

Methods of teaching:

Lectures, group discussion, and role-play were used. Visual aids in the form of posters, handout, and pamphlets were used. Two health educators in the hospital helped the researcher in the presentation of contents of the program and the interview. The contents were presented in a simple form to suit all educational levels of the patients, with the emphasis on benefits of compliance and good oral health practice rather than harmful effects of non-compliance

Contents of the program

1- General information about definition of peridontitis, signs and symptoms, causes, risk factors, and complications.

2- Benefits of early detection and compliance with treatment and how to overcome barriers to compliance.

3-Treatment options available, how to do tooth and tongue brushing, flossing, and mouth wash.

Evaluation procedure:

Impact evaluation level was used to assess short-term effect, immediately after the PEP, on patients' knowledge, beliefs, and practices immediate. One assessment was approached through pre-designed pilot-tested interview questionnaire. The questionnaire was designed to elicit the following information:

1-Personal and socioeconomic data.

2-Patients' knowledge about *peridontitis* consisted of 27 yes/no statements pertaining to patients' knowledge about definition of peridontitis, its signs and symptoms, risk factors, causes and complications of peridontitis, types of treatment options, uses of tooth brushing, flossing, and mouth wash.

Each question was scored from (0-1). The total score ranged from (0-27). Standardized item alpha reliability coefficient (ARC) was 0.797 for knowledge instrument.

3-Patients' beliefs about peridontitis using the principles of HBM: this was measured through Likert type statements scored from 1 to 3 with higher score for higher belief (p. susceptibility, p. seriousness, and p. benefits) and higher p. barriers. These included:

a- Perceived susceptibility (P. susceptibility): was measured through 4 items that all persons are susceptible to gingivitis, peridontitis and plaque can form in all mouths, plaque layer can lead to calculus, and simple gingivitis if not treated leads to peridontitis. The score ranged from 4 to 12, ARC=0.768

b- Perceived seriousness (P. seriousness): included 2 items that peridontitis is a serious disease causing loss of teeth, and may lead to dental abscess. The total score ranged from 2 to 6, ARC=0.774

c- Perceived benefits of compliance with treatment and keeping appointment: consisted of eight items entailing good oral hygiene, teeth brushing, flossing, professional cleaning may be beneficial for some cases, some types of mouth wash help prevent plaque formation and treatment, keeping appointment and compliance keep healthy gum and lead to complete recovery and surgery may be the best treatment for advanced cases after oral hygiene, and professional cleaning. The total score range was 8-24, ARC=0.737.

d- Perceived barriers to compliance with treatment and keeping appointment: included six factors pertaining to the

high cost of floss and treatment, fear of pain, professional cleaning is lost of time, long waiting time at clinic, and forgetfulness. The total score range was 6-18. ARC=0.835. A total HBM score was calculated by summing up p. susceptibility, p. seriousness, p. benefits, and minus p. barriers. The total score range was20-60.

4-The patient's behavior scale: included 14 multiple choice items regarding compliance with treatment, oral health practice, and keeping appointment, regular use of drug, proper teeth brushing, brushing two times daily, flossing daily, brushing tongue daily, eating balanced diet containing vegetables and fruits, decreasing snacking between meals, and seeking dentist help for any unusual periodontal symptoms. Each item was scored from 1 to 4 with higher score for the best oral practice as judged by two professors of dentistry. The total score ranged from 14 to 56.

Data analysis: Data were analyzed using SPSS program (version 11). The influence of PEP on knowledge, beliefs, and practice scores was assessed by examining the mean scores of data of the intervention and control groups using t-test. Chi-square test and a stepwise multiple regression model procedure were employed.

RESULTS

The intervention and the control groups were comparable with no statistically significant difference as regard most sociodemographic factors. Concerning age it was found that 80.6% of the intervention group belonged to age group (20-years) compared to 56.3% of the control. It was also noticed that 68% of the intervention group patients had (10-12 years) of education compared to 47.6% of the control group. These differences were statistically significant, χ^2= (=14.33, 9.98 p<0.01), respectively, Table 1.

Table 2 shows that the mean knowledge score of the intervention group was significantly higher than that of the control group (t=-6.352, p<0.01). Regarding health belief model (HBM) components, the table demonstrates that mean scores of

perceived seriousness, benefits, and barriers scores were significantly higher among the intervention group than those of the controls (t=-5.207, -7.175, 1.715), respectively. The table also points out that mean score of perceived barriers was significantly lower among the intervention group than those of the controls (t= 1.715)

The stepwise multiple regression in table 3 shows that factors entering the regression of models (1,2) of patients' practice were: sociodemographic (age, sex, marital status, family size, family head education, education of the patients, patient's work, and residence), total knowledge score, perceived susceptibility, perceived seriousness, perceived benefits, and perceived barriers, total HBM and only 4 out of 14 studied factors have predicted patients' practice of the control group: total knowledge, perceived benefits, patient work, and family size. The four variables together explained 24% of the variation of the practice score, patients' work positively predicted patients' practice, i.e., not working had poor practice. Among the

intervention group, the 14 variables entered and only 3 variables were selected: total knowledge, patient work, and total HBM score. The three variables explained 30.3% of the variance of the practice score. Patients' work negatively predicted patients practice, i.e., not working had good practice.

DISCUSSION

Tubaishat *et al.*, 2005 found thatoverall, the level oral health knowledge was low, and oral health practice was poor.[21] This result coincides with that of the present study, where the mean knowledge score of the control group was only 18.38±4.448 (total score=27) and the mean practice score of the control group was only 37.51±8.13 (total score=56) denoting low knowledge and poor practice. Similarly, Al-Otaibi and Angmar-Masson 2004 in the city of Makkah found that knowledge and awareness of oral health is very low. Despite the availability of free dental care at public health centers, 89% of the participants at the military center and

54% at university center sought only emergency care.[22] Wang et al., 2007[23] concluded from their study that most Chinese have no knowledge of common periodontal prevention and treatment and very few have regular dental care. [23] On the other hand, Vignarajah[24] 1997 found that the majority of young people were able to correctly identify signs of periodontal disease. However, they incorrectly defined the meaning of plaque. Students claimed good oral hygiene behavior and willingness to receive treatment from dentists. 74% of adolescents went to dentist at sometime. Cost and fear were found to be the common barriers for regular dental attendance.[24] Also, the present study showed that the patients had moderate barriers as its mean score among control group was 8.31±1.86 (the score range: 6-18). Bader et al., 1989[25] concluded that patients' knowledge was not perfect. Patients had a strong positive belief about keeping their teeth for lifetime

(benefits). Similarly, that study revealed that the patients had moderately high benefits as its mean score among control group was 18.18±2.98 (the score range: 8-24).[24]

Brown 1994[26] reviewed research in health education and health promotion, in the period of 1982 to 1992, a total of 57 studies evaluating the effectiveness of intervention to alter individuals' behavior related to dental health.[26] Combining the results of these 57 studies with descriptive articles published over the same period, it appeared that health education can result in improvements in objective measures of dental health behavior and oral health measures, but has only limited success in changing attitudes toward dental issues and achieves only short-term gain in knowledge.[26] Renz et al., 2007[27] concluded that there is tentative evidence from studies that psychological approaches to behavior management can improve oral hygiene related behaviors.[27]

in contrast, the present study shows that patients' mean knowledge; p. seriousness,

p. benefits, and p. barriers scores were significantly higher in the intervention group. Mean behavior and p. susceptibility scores were higher in the intervention group but didn't reach the significant level. Grocholewicz 1999 concluded that the results showed a distinct improvement of health awareness among examined children and less improvement in oral hygiene.[28] This may be due to that demonstrating behavioral change takes time and success is often judged by positive results.[26] While, the present study outcome evaluation measure was done immediately after the program, the patients couldn't apply his knowledge into practice but they could maximize their practice according to their understanding from the program. Other studies concluded that there have been impressive improvements in oral knowledge, attitudes and behavior after health education programs.[29-31]

The majority of oral disease is related to lifestyle and reducing these mostly chronic diseases rely much on changing behavior. For example, the

evidence that tooth brushing prevents periodontal disease is equivocal.[29] Hugoson et al., 2007[32] concluded that their study confirms the efficacy of three different programs in reducing supragingival plaque and gingival inflammation. Professional cleaning provides no clinical benefit beyond that derived form individual and group-based health education.[32] The study of Philippot et al., 2007[33] indicated that behavioral intervention is more effective than a classical intervention based on information and training about prophylactic techniques and in bringing most patients to normal level of plaque indices.

Facts are an important part of the message but must be complemented by reflection and consideration of how the receiver understands it.[34] This statement is in line with the results of the current study, where knowledge was a predictor of practice of both control and intervention groups. Hugoson et al., 2007[32] found that knowledge of dental diseases (caries, gingivitis and peridontitis) was a predictor

to good gingival health.[32] On the other hand, Aedman *et al.*, 2006[34] mentioned that facts are not enough to induce adolescents to change behavior.[34] Also Grocholewicz 1999 found that there is a discrepancy between children knowledge and prophylactic health behavior.[28.]

The present study reveals that total perceived benefits was a predictor of behavior among control group. Similarly, some studies pointed out that individuals who had favorable beliefs about the importance of preventive behavior for oral health had had better oral hygiene[35,36] and less periodontal disease.[36]

The present study demonstrates that work of patient was a positive predictor of patient's behavior among the control and a negative one among intervention group, Table 3. The patient's work, a possible surrogate of socioeconomic status, may also be linked to health care practice among the control group. Similarly, Grocholewicz 1999 noticed that patients'

socioeconomic status had influence on building good hygiene.[28] While, after the intervention, the patients understand the good practice and its benefits and accordingly report the right practice regardless of their work.

CONCLUSION AND RECOMMENDATIONS

It could be concluded that in spite of one session the hospital based-peridontitis education program, it proved to have positive effects on peridontitis patients' knowledge, and beliefs (p. seriousness, p. benefits, and p. barriers).

The study recommended the replication of such PEP and a more long term one among many peridontitis patients to have more improvement in patients' knowledge, beliefs and bringing improvement in p. susceptibility and practice, especially compliance and oral hygiene. Finally, in spite of that the present study showed number of important factors affecting patients' practice, yet much of their variance was not explained. Therefore, continued exploration of other predictors is an essential action.

Table 1: Distribution of the sample according to their sociodemographic characteristics

Sociodemographic characteristics	Control N=103		Intervention N=103		Total N=206	
	No	%	No	%	No	%
Sex						
Males	91	88.3	87	84.5	178	86.4
Females	12	11.7	16	15.5	28	13.6
Age*						
<20 year	33	32.0	16	15.5	49	23.7
20-	58	56.3	83	80.6	141	68.5
40-+	12	11.7	4	3.9	16	7.8
Marital status						
Single	6 9	67.0	75	72.8	144	69.9
Ever married	34	33.0	28	27.2	62	30.1
Family size						
<5 person	18	17.5	14	13.6	32	15.6
5-	62	60.2	67	65.0	129	62.6
10+	23	22. 3	22	21.4	32	15.6
Education of family head						
≤9 years	22	21.4	33	32.0	55	26.7
10-	32	31.1	23	22.4	55	26.7
>12	49	47.6	47	45.6	96	46.6
Education of patient*						
≤9 years	26	25.2	20	19.4	46	22.3
10-	49	47.6	70	68.0	119	57.8
>12	28	27.2	13	12.6	41	19.9
Work of patient						
Not Working	30	29.1	21	20.4	51	24.7
Student	50	49.5	51	50.5	101	49.1
Employee	23	22.3	31	30.1	54	26.2
Type of house						
Apartment	25	24.3	25	24.3	50	24.3
Villa	78	75.7	78	75.7	156	75.7

*p<0.01

**Table 2: Impact of glaucomatous education program on peridontitis'
Knowledge, beliefs (HBM: P. susceptibility, seriousness, benefits and
barriers, and total HBM score) and Practices of Peridontitis patients**

Variables	No.	Mean±SD	t	p
Total knowledge Control group Intervention group	103 103	18.38±4.448 21.84±3.30	-6.352*	0.001
Perceived susceptibility Control group Intervention g	103 103	9.01 ±1.66 10.19±1.44	-5.478*	0.142
Perceived seriousness Control group Intervention g	103 103	4.22±1.24 5.04±0.10	-5.207*	0.001
Perceived benefits Control group Intervention g	103 103	18.18±2.98 20.94±2.54	-7.175*	0.038
Perceived barriers Control group Intervention g	103 103	8.88±2.83 8.31±1.86	1.715*	0.002
Total HBM score Control group Intervention g	103 103	22.52±4.9 6 27.86±4.06	-8.45	0.061
Total practice score Control group Intervention g	103 103	37.51±8.13 41.41±7.07	-3.67	0.274

*=p<0.01

**Table 3: Summary of Stepwise Multiple Regression Analysis for peridontitis
Practices for control (N=103) and intervention group (N=103)**

Predictors	B	Beta	SE	T	R²	F ratio	P
Models 1, 2 total practice score:							
Control group Constant	10.434		5.243	1.99	0.24	7.735	0.049
Total knowledge	0.525	0. 287	0.166	3.159			0.002
Total benefits	0.597	0.218	0.251	2.382			0.019
Work	1.159	0.194	0.526	2.203			0.03
Family size	-0.216	0.194	1.145	2.16			0.033
Intervention group							
Constant	12.097		4.668	2.592	0.303	14.363	0.011
Total knowledge	0.513	0.239	0.210	2.447			0.016
Patient work	-1.295	-0.212	0. 536	-2.416			0.018
Total HBM	0.716	0.411	0.176	4.076			0.000

Factors entering the regression:
Models 1&2: Sociodemographic variables (age, sex, marital status, family size,
family head education, education of the patient, patient work, residence), total
knowledge score, p. susceptibility, p. seriousness, p. benefits, p. barriers, and total
HBM.

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