

# Effect of Anticipatory Guidance Presentation Methods on the Knowledge and Attitude of Pregnant Women Relative to Maternal, Infant and Toddler's Oral Health Care

Nahid Ramazani<sup>1</sup>, Iraj Zareban<sup>2</sup>, Rahil Ahmadi<sup>3</sup>, Saeede ZadSirjan<sup>4</sup>, Mohammad Daryaeian<sup>5</sup>✉

<sup>1</sup>Assistant Professor, Children and Adolescent Health Research Center, Dental Research Center, Dept of Pediatric Dentistry, School of Dentistry, Zahedan University of Medical Sciences, Zahedan, Iran

<sup>2</sup>Department of Health Education, School of Health, Zahedan University of Medical Sciences, Zahedan, Iran

<sup>3</sup>Assistant Professor, Department of Pediatric Dentistry, School of Dentistry, Shahed University, Tehran, Iran

<sup>4</sup>Postgraduate Student, Department of Endodontics, School of Dentistry, Shahid Beheshti University, Tehran, Iran

<sup>5</sup>Postgraduate Student, Department of Endodontics, School of Dentistry, Shahed University, Tehran, Iran

## Abstract

**Objective:** The prenatal period is the best time for health interventions. The aim of this study was to evaluate the effects of different methods of anticipatory guidance presentation on the change of knowledge and attitude of pregnant women regarding oral healthcare in the mother, infant and toddler.

**Materials and Methods:** In this quasi-experimental study, 90 pregnant women attended one health center in Zahedan, Iran; they were divided into direct intervention, indirect intervention and control groups. A self-reported questionnaire was completed before intervention. The guidance was presented to the direct intervention group, by PowerPoint and to the indirect group by pamphlet. Immediately after the intervention, the questionnaire was completed by intervention groups and two months later by all participants. Difference in the scores at start and end was calculated. Mann-Whitney, Kruskal-Wallis with Dunn's post hoc and Friedman with K-W post-hoc tests were used for statistical analysis. The data was analyzed using SPSS version 19 software at a significance level of 0.05.

**Results:** The change in scores of knowledge relevant to maternal, infant and toddler's oral health and attitude toward maternal oral healthcare had significant differences in the three studied groups ( $P < 0.05$ ). The changes of scores in the four mentioned variables in the intervention groups were significantly higher than controls. In comparison between the intervention groups, the change in score of knowledge about maternal oral healthcare was significantly higher in the direct intervention group ( $P = 0.023$ ).

**Conclusion:** Anticipatory guidance presentation led to change in the score of knowledge about maternal, infant and toddler's oral health and attitude towards maternal oral health in comparison to no presentation. The direct presentation had superiority over indirect in increasing knowledge about maternal oral healthcare.

**Key Words:** Attitude; Knowledge; Oral Health; Pregnant Women

✉ Corresponding author:

M. Daryaeian, Department of Endodontics, School of Dentistry, Shahed University, Tehran, Iran

Mohammad.Daryaeian@yahoo.com

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## INTRODUCTION

Parents have an essential role in mediating between their children and environment. This mediation is done through preventive services they provide to their children such as dietary

habits supervision, oral hygiene performance and other practices [1]. In this context, the important role of mothers in establishing lifelong positive attitudes and behaviors has been documented [2].

Infancy and toddlerhood are considered as dynamic stages in terms of dental development and stabilization of the oral health habits. These periods are also considered as critical times in terms of risk of early childhood caries (ECC), dental injuries, and etc [3]. Improving maternal knowledge about these periods plays a major role in developing oral health habits and preventing diseases like ECC. Therefore, the best time to start informative programs is the prenatal period [3, 4]. Those parents who are expecting the birth of their child, especially their first, will welcome the preventive advice the most [3]. The American Academy of Pediatric Dentistry introduced an anticipatory guidance to present this information. The anticipatory guidance is relatively new in dentistry [5] and is described as a consultancy technique which discusses children's needs at a particular stage of life. This guidance provides preventive messages and promises passing through the childhood period without preventable oral diseases [6]. In addition, it is important for mothers to have sufficient information on the condition of their oral health [7, 8]. Hence, the guidance emphasizes on the importance of mother's oral health and the possibility of transmission of cariogenic bacteria to their child [5].

The results of the study carried out by Bahri et al. indicated positive effects of two one-hour sessions per week training program for 3 weeks to improve knowledge and attitude of the pregnant mothers on oral health [9]. Lin et al. discussed clinical services for women who are at risk of preterm or low-weight infants. This study showed improvement in oral health knowledge after providing limited clinical services [10]. Evaluating the gain in knowledge of oral health after education to pregnant women, Cardenas et al. reported improved immediate and one-month knowledge after a 10-minute presentation on dental anticipatory guidance [11]. Capasso et al. [12], George et al. [13] and Wandera et al. [14] emphasized training programs about oral health of preg-

nant mothers to promote oral health during pregnancy. Paradis et al. reported that a 15-minute educational DVD of newborn anticipatory guidance had a positive impact on parents' knowledge about routine well-child care [15]. In a research carried out by Rothe et al, the effectiveness of a 30-minute PowerPoint and video presentation in improving the oral health knowledge of parents caring for an infant was demonstrated [16]. Hoeft et al. [17], Dimitrova [18], and Lopez del Valle et al. [19] also emphasized execution of training programs on pediatric dental healthcare for mothers. The results of a research conducted by Kaste et al. showed that a 45-minute oral health lecture before birth improved knowledge of pregnant women on infant's oral health [20]. A study carried out by Plutzer and Spencer showed that the oral health program in the form of anticipatory guidance provided via interview and telephone consultation was successful in reducing severe ECC [6]. The research of Zanata et al. which aimed to study the effect of caries preventive measures in pregnant women on the caries experience in children showed that the average number of tooth surfaces with caries in children reduced after receiving prophylactic measures and oral hygiene instructions by mothers during pregnancy [21]. To study the efficacy of a preventive program for pregnant women, Gomez and Webber indicated that preventive and restorative programs were effective in preventing dental caries [22]. With respect to the importance of measuring knowledge and attitude of pregnant women about oral healthcare and lack of studies carried out on this issue in the pertinent population, the present study aimed to provide pregnant mothers with the anticipatory guidance and to evaluate its effects on promoting knowledge and attitude toward oral healthcare of the mother, infant and toddler.

## MATERIALS AND METHODS

This study was approved by the Research and Ethics Committee of Zahedan University of

Medical Sciences and informed consent was given by the participants. This quasi-experimental research studied women who were in their first pregnancy attended one health center of Zahedan in 2011. The initial sample size was 24 subjects in each group (intervention 1, intervention 2 and control groups), considering previous studies [9, 18, 19] and based on a power of 0.9 and a type I error of 0.05. Finally, accounting for attrition of the sample during the study, the sample size was increased to 30 in each group. The inclusion criteria were pregnant women having the ability to read and write in Persian. The exclusion criteria included having a considerable medical problem and passing the oral health training course during pregnancy or before. Subjects were chosen with convenience sampling method and then randomly divided into 3 groups. Allocation method of these 90 participants into different groups was as follows: Separate sheets were put in specially encoded envelopes with the same color and size (30 each). Each subject selected one envelope, opened it, and was allocated to one group according to the name written in the envelope. Thus, 30 participants were randomly assigned to intervention 1 and 30 assigned to intervention 2 groups. Thirty subjects were placed in the control group.

Data collection was performed using the validated questionnaire. Its face and content validity was determined through a panel of experts. To study the quality of tools as per the replies received from the experts, those items with a content validity ratio exceeding 0.62, were accepted. A content validity index above 0.79 was also confirmed. Reliability of the questionnaire was determined through the test-retest. To do so, the questionnaire was filled out by 30 people whose features were similar to the ones of the statistical population. Cronbach- $\alpha$  was 76% and 75% for questions of knowledge and attitude toward maternal oral healthcare, 76% and 73% for infants and 75% and 74% for toddlers, respectively. The

final questionnaire included four parts. Demographic questions were placed in part one and questions on maternal, infant and toddler's oral healthcare were placed in parts two to four (35 questions). The range of scores of knowledge on oral healthcare of mother, infant and toddler was 0 to 6, 0 to 7, and 0 to 7, respectively. The range of attitude for each was 0 to 10. The questions were scored accordingly.

Initially the volunteers were provided with some necessary explanations to participate. The women were asked if they would be interested in participating in the study and requested to sign a consent form prior to enrollment. Subjects were then asked to complete the self-reported questionnaires. After that, the subjects in the intervention groups were exposed to the anticipatory guidance, which had been prepared in mother, infant, and toddler's oral healthcare sections. The content of this guidance was prepared according to the reference texts and confirmed by four specialists in pediatric dentistry. It should be noted that the necessary information provided in infant and toddler's oral health sections was for ages 0-1 and 1-3, respectively. For the direct intervention group, the guidance was provided face-to-face using PowerPoint and for the indirect intervention group, it was provided in a pamphlet with identical content. Immediately after the intervention, the questionnaires were filled out by the subjects of the intervention groups and the indirect intervention group took the pamphlet. No intervention occurred in the control group.

After a waiting period of two months, all the participants (the intervention and control groups) were asked to complete the same questionnaire. In order to thank the volunteers and motivate them to participate until the end of the study, an oral health kit was given at the start and the end.

Furthermore, at the end of the project, the prepared pamphlets were awarded to the samples of the direct and the control groups. During

PowerPoint presentation or reading the pamphlet, every question raised was answered; however, the participants were not allowed to ask any questions during completion of the questionnaire.

### Statistical analysis

After collecting the questionnaires, the scores of knowledge and attitude were calculated by adding the scores allocated to the given answers.

Analysis of the data was carried out using SPSS statistical software (v. 19, SPSS Inc., Chicago, IL, USA).

The analyzer was blind to the type of groups. The Kruskal-Wallis test was used to compare the groups; Dunn's post hoc test was used for pairwise comparison of groups (Mann-Whitney U test was used to compare the two groups of intervention immediately after guidance presentation).

Friedman's test was applied to compare each group at the start, immediately after the intervention and in the end. The K-W post-hoc test was applied to compare the knowledge at the start and in the end in each group. The significance level was set as 0.05.

### RESULTS

Seventy-six women remained throughout the study. Their mean age was  $23.64 \pm 3.22$  years; 47.4% (36) of the mothers had high school diplomas, 10.5% (8) had college degrees, and 42.1% (32) had a bachelor's degree; 21.05% (16) were in their first trimester of pregnancy, 53.95% (41) were in the second trimester of pregnancy, and 25.0% (19) were in the third trimester of pregnancy. The groups were identical in terms of age (ANOVA,  $P=0.101$ ), trimester of pregnancy ( $\chi^2$ ,  $P=0.071$ ) and level of education ( $\chi^2$ ,  $P=0.076$ ).

**Table 1.** Mean scores of knowledge and attitude of pregnant women in the studied groups

Variable	Group (n)	Start	Immediately After Intervention	End	Change of Score***	
		Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	
Knowledge	Mother	Direct (28)	3.31(0.49)	5.37(0.73)	4.69(0.70)	1.38(0.72)
		Indirect (23)	3.31(0.75)	4.78(0.91)	4.30(0.78)	0.99(0.67)
		Control (25)	3.66(0.70)		3.6(0.67)	-0.06(0.66)
		P value	0.767*	0.025**	<0.001*	<0.001*
	Infant	Direct (28)	3.16(0.73)	5.29(1.01)	4.51(1.03)	1.35(0.96)
		Indirect (23)	3.15(0.81)	5.26(0.91)	4.38(0.88)	1.23(1.02)
		Control (25)	3.20(0.70)		3.42(0.85)	0.22(0.52)
		P value	0.999*	0.842**	<0.001*	<0.001*
	Toddler	Direct (28)	3.67(0.82)	4.75(1.26)	4.87(0.55)	1.2(1.38)
		Indirect (23)	3.35(0.90)	5.25(0.77)	4.26(0.77)	0.91(1.06)
		Control (25)	4.12(1.24)		4.48(0.97)	0.36(0.85)
		P value	0.101*	0.068**	0.045*	0.008*
Attitude	Mother	Direct (28)	7.92(0.85)	9.00(0.96)	9.30(2.80)	1.38(0.94)
		Indirect (23)	8.11(0.91)	9.30(0.53)	8.55(0.65)	0.44(0.84)
		Control (25)	8.26(0.85)		8.13(0.79)	-0.13(0.52)
		P value	0.523*	0.712**	0.233*	0.016*
	Infant	Direct (28)	7.09(0.75)	8.51(0.89)	7.55(0.82)	0.46(0.87)
		Indirect (23)	7.53(0.73)	8.49(0.89)	7.88(0.65)	0.35(0.58)
		Control (25)	7.38(0.67)		7.36(0.62)	-0.02(0.46)
		P value	0.251*	0.892**	0.130*	0.154*
	Toddler	Direct (28)	9.23(0.65)	9.85(0.28)	9.70(0.39)	0.47(0.56)
		Indirect (23)	9.04(0.78)	9.70(0.45)	9.21(0.86)	0.17(0.87)
		Control (25)	8.83(0.65)		8.75(0.89)	-0.80(0.74)
		P value	0.198*	0.299**	0.001*	0.057*

\* Kruskal Wallis test was used to compare the groups.

\*\*Mann Whitney U test was used to compare the intervention groups immediately after the intervention

\*\*\* Difference of the scores at the start and end  $P < 0.05$

No significant difference was seen in the mean scores of knowledge and attitude toward maternal, infant, and toddler's oral healthcare between different groups ( $P>0.05$ ) at onset. Immediately after the intervention, only the mean score of knowledge about maternal oral health in the two intervention groups had significant statistical difference ( $P=0.025$ , Table 1).

At the end of study, the mean scores of knowledge relevant to maternal, infant and toddler's oral healthcare as well as the attitude toward toddler's oral healthcare in three groups had a significant statistical difference ( $P<0.05$ ).

Regarding the variables of knowledge toward maternal and infant's oral healthcare at the end, only the control group had a significant difference with each of the other two groups ( $P<0.05$ ). In terms of the variable of knowledge about toddler's oral healthcare at the end, a significant difference was seen between the intervention groups ( $P=0.016$ ). In addition, a significant difference was seen between the direct intervention and the control groups in terms of the attitude about toddler's oral healthcare at the end ( $P<0.001$ ).

The mean change in scores (difference at start and end) of knowledge toward maternal, infant and toddler's oral healthcare was significantly different among the three groups ( $P<0.05$ ). In addition, the mean change in scores of attitude to maternal oral healthcare was significantly different in all three groups ( $P=0.016$ ). A significant difference was seen in the mean change in scores of knowledge about maternal oral healthcare in pairwise comparisons of all three groups ( $P<0.05$ ). Moreover, there was a significant difference in the mean change in scores of knowledge about infant and toddler's oral healthcare and change in score of attitude towards maternal oral healthcare between the control group and the direct and indirect intervention groups ( $P<0.05$ ). No change occurred in the score of knowledge about infant and toddler's oral healthcare and score of attitude

towards maternal oral healthcare in the two intervention groups ( $P>0.05$ ).

In the intervention groups, a significant change occurred in the mean scores of knowledge and attitude toward maternal, infant and toddler's oral healthcare with time. A significant difference was seen between the scores of all the variables when comparing the onset to end, except for attitude toward infant's oral healthcare in the direct intervention group ( $P=0.083$ ) and attitude toward maternal oral healthcare in the indirect intervention group ( $P=0.113$ ). No significant difference was seen in the mean scores of knowledge and attitude in the control group ( $P>0.05$ ).

## DISCUSSION

Training pregnant mothers is one of the effective approaches to promote oral health. Not only does it improve the mother's oral condition, but it also improves the infant and toddler's oral health. In the present study, comparing the direct and indirect intervention groups and the control group, the mean change in scores of knowledge toward maternal, infant, and toddler's oral healthcare and the mean change in score of attitude toward maternal oral healthcare were significantly different, whereas no significant difference was observed in the mean change in scores of attitude toward infant and toddler's oral healthcare. The mean change was the highest in scores of all the variables in the direct intervention group and the lowest in score of knowledge in all parts in the control group. The mean change in scores of knowledge about maternal oral healthcare in the direct and indirect intervention groups had a significant difference; whereas, no significant difference was found between the intervention groups in the mean change in score of knowledge about infant and toddler's oral healthcare and the mean change in score of attitude about maternal oral healthcare.

Many studies have discussed knowledge of oral diseases [23], oral health behaviors [9, 24,

25], need for treatment [23], and dental visits [23, 24] of pregnant women; however, few studies [9, 10] have evaluated the effect of training interventions during pregnancy and their sustainability effect. Other studies discussed knowledge and attitude of parents, women of childbearing age, kindergarten nurses, and medical students on dental care of infants and children [19, 26-29].

To determine the impact of intervention, we recorded the scores of variables at baseline (before presenting the guidance). After presenting the intervention and while comparing the frequency of correct answers at the start and in the end, it became clear that knowledge and attitude about maternal oral healthcare had improved in the majority of questions. Improvement was also seen in all the knowledge and most of the attitude questions on infant oral healthcare in both intervention groups as well as in all questions on knowledge of toddler's oral healthcare in each intervention group. Although no significant difference occurred in the attitude toward infant's oral healthcare in the direct intervention group and attitude toward maternal oral healthcare in the indirect intervention group, the increase of the scores of these variables was evident. This finding is consistent with the study of Cardenas et al, in which the presentation of the oral anticipatory guidance was performed using PowerPoint [11] and the study of Rothe et al. [16]. In the study of Bahri et al, in line with our study, a significant difference was achieved in the scores of knowledge and attitude toward maternal oral healthcare after briefing [9]. Lin et al. [10] and Kaste et al. showed that the lecture presented on oral health improved knowledge of pregnant women about children's oral health [20].

The present study showed that the intervention groups had a significant difference with each another and the control group, which shows the positive effect of the intervention, especially the direct intervention on positive change of the score of knowledge relevant to

maternal oral healthcare. With respect to the items mentioned above, it can be concluded that regarding the mean change in score of knowledge toward infant and toddler's oral healthcare, neither of the above presentation methods had superiority over the other; while the direct presentation had a considerable superiority in changing the score of knowledge about maternal oral healthcare. This expresses the fact that a pregnant mother can be affected by the guidance presentation method in this two-month study to increase the knowledge on her oral healthcare.

In comparing the mean change in score of attitude toward maternal oral health care, a significant difference was achieved between groups and the intervention groups had no superiority over each other in this concern. However, comparison of the mean change in the score of attitude toward infant's oral health care and toddler's oral health care showed no significant difference between the studied groups. It indicates that the attitude of pregnant women towards maternal, infant, and toddler's oral healthcare was not influenced by the method of presentation immediately after the intervention and at the end. In contrast to our findings, in the study of Bahri et al., a significant difference was found in the score of attitude toward maternal oral healthcare at the end between the case and control groups [9]. Although the duration of the study of Bahri et al. is similar to ours, this difference might be due to the type of intervention, the way it was presented, the study population, and sample size.

Additionally, with respect to the changes achieved in the score of attitude toward maternal oral healthcare, it is concluded that presentation of guidance can cause a significant change in the score of attitude toward maternal oral healthcare in comparison with no guidance presentation. Therefore, neither of these two methods has superiority over the other; whereas, the direct presentation had a significant impact on changing the score of knowledge toward maternal oral healthcare.

It might be due to the fact that the changeability of the score of attitude toward maternal oral healthcare –influenced by the method of presentation – requires a study longer than our study. The direct and indirect presentation had no superiority over each other or over the control group in terms of changing the score of attitude toward infant and toddler's oral healthcare.

In our study, all volunteers were in their first pregnancy and this might have affected their motivation to receive intervention.

In spite of this, the findings of the present study cannot be generalized, as many pregnant women attend to the private clinics and this can affect the impact of the presented intervention, and the change of score of variables. In addition, some unknown confounding factors including the previous oral problems and socioeconomic status can affect the results.

## CONCLUSION

Based on the results, presentation of the anticipatory guidance through the direct and indirect methods led to change in the score of knowledge about maternal, infant and toddler's oral healthcare and attitude toward maternal oral healthcare in pregnant women in a two-month period. In addition, the direct presentation of this guidance had superiority over the indirect presentation to create change in the score of knowledge about maternal oral healthcare.

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