World Applied Sciences Journal 22 (5): 647-656, 2013
ISSN 1818-4952

DOI: 10.5829/idosi.wasj.2013.22.05.1838

Self-Reported Oral Hygiene Habits and Self-Care in the Oral Health in Sample of Iranian Women During Pregnancy

[1]*Mohsen Shamsi,* [1]*Alireza Hidarnia and* [1]*Shamsadin Niknami*

Department of Health Education, School of Medical Sciences,
Tarbiat Modares University, Tehran, Iran

Abstract: *Objectives* The aim of this study was to describe the self-reported of oral hygiene habits and self-care in the oral health in a sample of Iranian women during pregnancy aged 21-35 years. *Material and Methods* A cross-sectional study was carried out on 340 pregnant women living in arak (a city in Iran) in 2011. The sampling procedure used was a stratified cluster sampling technique. Subjects were randomly selected and questionnaire was given to women in 15 health centers. Questionnaire included general health, the level of knowledge¡ DMFT and socioeconomic conditions, gingival conditions, oral hygiene and utilization of dental health services. A multivariate regression analysis was used to determine statistically significant associations between DMFT and other variables. *Results* The mean of knowledge of the women is 43.2 ±9.8 and the mean DMFT was 5.4±2.83. In this study 38% of the population perceived signs of gingival inflammation; 7% of the pregnant women assessed their gingiva as poor, while 31% reported good and 40% normal gingival condition.The multiple logistic regression analysis, including demographic variables (i.e., age, coverage insurance, level of education and etal.) accounting for 41.2% of the variance in oral health behavior. *Conclusion* A large proportion of the pregnant women in this study had oral health problems; however, more than half of the women had not seen a dentist during their pregnancy.

Key words: Oral health · Pregnancy · Oral hygiene · Self-care

INTRODUCTION

According to the WHO oral health is defined as 'being free of chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects and other diseases and disorders that affect the mouth and oral cavity" [1]. Oral diseases cause serious long-term problems regarding both social (e.g. social confidence) and physical (e.g. heart disease) aspects [2-3] However, despite considerable improvement in the field of oral health throughout the world, oral health problems still persist both in developed and developing countries [4]. In fact the combination of high prevalence, insufficient treatment rates, missed preventive opportunities and intermittent symptoms led the US Surgeon General to publish a report in 2001 on oral health in America characterizing dental and oral disease as a "silent epidemic" [5]. Nevertheless in during pregnancy maternal oral health is essentioal to the health and well being of both mother and baby the CDC's Pregnancy Risk Assessment Monitoring System (PRAMS) reported that only 23-43% of pregnant women received dental care during their pregnancies a rate only half to two-thirds of US women's overall use of dental services (67%) [6].

significant differences were found between the gingival conditions of women during pregnancy and after delivery; also observed that existing gingival problems were aggravated during pregnancy. Further, the aetiology of gingivitis during pregnancy is shown to be complex. Firstly, changes in the bacterial flora of the dental plaque were found even with no increase in the amount of dental plaque; secondly, during pregnancy higher levels of progesterone and estrogens in blood appear to affect the permeability of the blood capillaries in the gingiva and thereby increase susceptibility to gingival inflammation due to bacterial, physical and chemical irritation. Most authors conclude that gingival problems during pregnancy can be reduced considerably if the sub gingival plaque is kept at a low level and they suggest that dentists play an important role offering oral health

Corresponding Author: Department of Health Education, Tarbiat Modares University, Tehran, Iran.
P.O. Box: 14115-331, Tel: +098-21-82883817.

education and plaque control to their pregnant patients. According to a previous report, the prevalence of gingival inflammation during pregnancy, termed ‘‘pregnancy gingivitis’’, may vary from 30% to 100% of examined women [7-8].

A population-based cross-sectional study conducted in North Dakota revealed that young women, women in poverty and women with Medicaid coverage were at increased risk of not having a dentist visit during their pregnancy [9]. In another study, Gaffield *et al*. analyzed pregnancy risk monitoring system data from 4 states they found a modest increase in risk of dental care underuse associated with poverty, Medicaid coverage and late-onset prenatal care among women who reported having a dental problem during pregnancy [6]. In another study in Iran Haji Kazemy *et al.* showed that majority (70%) of pregnant women had negative attitude regarding the performance of oral and dental care in during pregnancy [10]. Moreover in another study in Iran Fazel *et al.* showed that among 757 individuals were subjected to an oral examination of which only 8.7% were free of any oral/dental disease [11]. An estimated 1000 to 1500 women in the Arak city become pregnant each year [12]. Despite a general reduction in dental caries in all ages, studies show that it remains high during pregnancy since approximately 40 to 90 percent of women with pregnancy suffer from dental caries in developing countries. Indeed the Eastern Mediterranean region, which also includes Iran, has the high mean for decayed, missing and filled teeth (DMFT) [13]. some studies have shown that the level of oral health in Iran is low, as there is a high rate of untreated caries among pregnant women. Unfortunately meanwhile, systematic data on the self assessment of gingival conditions among pregnant women are very limited and no information is found on selfcare practices of pregnant women in relation to perceived signs of gingival or periodontal disease. Self-care implies people’s health-related behaviour aiming to maintain or enhance health, and self-care practices may take various forms in relation to preventive care, cure or rehabilitation. When self-care is initiated in response to illness and/or signs of disease, it is often red to as illness behaviour. Such actions are characterized by the following components: decision of doing nothing about the symptoms, decision on self-treatment or self-medication and decision in relation to consulting professionals.

It is therefore crucial that the oral hygiene habits, oral health knowledge and status of dental caries women with pregnancy in Iran be assessed as they are an important and high-risk group. Moreover, non-compliance oral health during pregnancy can affect the health of the fetus.

MATERIALS AND METHODS

A cross-sectional study carried out in Arak city, located in the Markazi Province of Iran in 2011, Permission to conduct the study was sought and obtained from the health center in Markazi Province.

Arak city was divided into three zones according to socio-economic status (SES). The required sample size needed for this study was computed using the equation:

$$n = \frac{(Z_{1-\frac{\alpha}{2}})^2 . p.q}{d^2} = \frac{.8490}{0/0025} \cong 340$$

where “n” was the sample size, “P” was the estimated prevalence proportion observed in a pilot study (0.67), “z” was the probability (0.975) and “d” was the standard error (0.05). Thus with these constraints and probabilities, a sample size of 340 pregnant women was arrived at. The sampling procedure used was a stratified cluster sampling technique incorporating 3 stratified zones, for each of which a cluster of women with pregnancy were recruited from randomly (with serial number cards)selected in 15 health centers. The number of health centers in zones 1, 2 and 3 were 13¡ 11 and 14 respectively. Each of zones random selected of 5 health centers.

In this study inclusion criteria included consent women with pregnancy for the study and without of oral diseases progressive. Exclusion criteria is lack of interest or the mother has advanced dental disease. The women agreed to participate and complete a questionnaire. All women gave their informed consent. women participation was voluntary and anonymous using self-administered data collection procedures. The study was approved by both the Ethics Committee of Tarbiat Modares University (Tehran-Iran) with code 3155 and the health center Arak province in 2011.

Measurements: The questionnaire comprised some questions including: (1) sociodemographic factors (age, education, time of pregnancy and so on); (2) perceived oral health (gingival condition, dental pain, periodontal disease, dental caries); (3) oral health habits (dental visits, tooth brushing, dental flossing, other oral hygiene aids and fluoride toothpaste and utilization of dental health services (4) instructions relating to oral health care by the dentist or midwife; and (5) knowledge about oral health. knowledge was evaluated based on their information about causes of caries¡ fluoride importance use of dental floss and *et al*. Knowledge questionnaire include 15 item multiple choice question that correct answer is score=1

and incorrect answer score=0 then total score based on 100 score and level of knowledge low (0-30)¡ moderate (31-60) and high (61-100) calculated. Internal reliability analysis was conducted on all of the knowledge Cronbach's alpha scores were moderately high for knowledge (knowledge =. 81).

The monthly family income was measured using a three-point scale [1 = low (0-500$), 2 = moderate (500-800$), 3 = high (>800$)]. The frequency of tooth brushing was assessed on a six-point scale (1 = never, 2 = less than a month 3 = less than a week, 4= once a week, 5=once a day and 6= twice a day). The use of dental floss was measured using a five-point scale (1 = never, 2 =less than a month 3 = less than a week, 4= once a week and 5 = once a day). Furthermore, women with pregnancy were asked to indicate their oral health status using a three point scale (1 = poor, 2 = average and 3 = good). Dental caries status was assessed in terms of decayed teeth (DT), filled teeth (FT) and decayed, missing and filled teeth (DMFT).A clinical examination for caries was done using the DMFT index. DMFT in the subjects was assessed by a single examiner and the intra-examiner reliability for caries status (Kappa statistic) was 0.89. The clinical dental examination was conducted in the health centers on a comfortable chair with the aid of a headlamp and mouth mirror.

Statistical Analysis: The questionnaires were reviewed and entered into a database constructed using the program SPSS [16], which was used to perform the statistical analysis. Descriptive variables are expressed as frequency, mean and overall range. The 95% CI was calculated for the precision of prevalence estimates. Pearson chi-square tests were conducted to assess associations between quality personal items and oral health status, in this part, Variables that had more than two categorical response choices were recoded into dichotomized variables.

Moreover multivariable regression analysis was used to evaluate person-level characteristics that may predict obtaining dental care during this period.

RESULTS

The mean age of the women was 28.2 (3.7) years (range: 21-35 years). The majority of the women (40%) had middle school, 16% had graduated from university. The demographic characteristics of the women are shown in Table1.

30 percent (N=103) of the respondents reported one or more gingival symptoms during pregnancy such as bleeding gums when brushing the teeth, spontaneous bleeding from the gums, pain from the gums, change in color of the gums or swollen gums (Table 1).

Bleeding of the gums when brushing the teeth was the most frequent symptom. Were found associations between signs of gingival inflammation and age and socioeconomic variables. The oral hygiene habits of participants are described in Table 1.

The mean time of pregnancy is 18±6 week. Of the women, 212 were first trimester male (63%) and the majority brushed their teeth once a day (43.4%) and most of them did not use dental floss (41%). (Table 2).

Finding showed that mean knowledge is 43.2 ±9.8 about oral health and 22% of the subjects had high awareness toward oral health, whereas 48% and30% of the women had moderate and low level of awareness respectively. In this study 48% of the women were completed aware of the caries preventive role of fluoride while 37% of them replied this question as "I don't know" (Table 3).

The proportion of those women who did not know the meaning of ''periodontal problems'' was highest (38%) among the youngest women. Regarding factors involved in caries as main factors 17% expressed microbial activity¡ 40% consumption of sugar food in this period and 43% lack of hygiene. It should be noted that an increase level of education enhance the mother knowledge. A Spearman correlation test showed that monthly family income and the Social status economic classification used in the sample selection process were highly correlated ($r = 0.681, P<0.001$).

A one way ANOVA showed that the age of the women had a significant effect on the DMFT value, Tuky test showed that as with increasing age the DMFT value increased ($P<0.001$). the odds of experiencing caries (DMFT, DT, FT) increased with increase in participant's age. Significant positive correlations existed between the participant's age and DMFT ($r=0.44$), DT ($r= 0.36$) and FT scores ($r= 0.41$), respectively. Prevalence of subjects with DT>5 was higher in women with low income family (OR 1.84, 95% CI, 1.35-2.14).The incidence of caries in subjects who never flossed was approximately two time that of individuals who flossed once a day, as demonstrated in Table 3 ($P<0.001$).

Questionnaire result showed that 95.4% of pregnant women understand that cleaning their teeth will reduce tooth decay. 4.6% of them did not consider that dental

Table 1: Demographic characteristics and dental variables of the women with pregnancy recruited in this study

Demographic and dental variable	Frequency (percent)	N(%)
Level of education	Elementary school	19 (6)
	Middle school	137 (40)
	High school	131 (38)
	College or university	53 (16)
Coverage insurance	Yes	255(75%)
	No	85(25%)
Monthly family income	0-500$(low)	98(29%)
	500-800$(moderate)	160(47%)
	>800$(high)	82(24%)
Current dental pain	Yes	28 (8%)
	no	312 (92%)
Dental pain last time	Less than 6 months ago	41(12%)
	6-12 months ago	38 (11%)
	1-2 years ago	73 (22%)
	More than 2 years ago	111 (32)
	Never	77 (22%)
Periodontal disease now	Yes	103(30%)
	no	209(61%)
	Do not know	28 (9%)
Toothbrushing instructions from a dentist anytime	Yes	57 (17%)
	no	283 (83%)
Most important reason for toothbrushing	To keep mouth fresh	118 (35%)
	To prevent dental caries	186 (54%)
	To prevent periodontal diseases	78(23%)
	Do not know	4 (1%)
Reason for a dental visit	For check-up	35 (10%)
	For tooth cleaning and scaling	63 (18%)
	When treatment is needed	98 (28%)
	When pain	132 (38%)
	Other reason/never	12 (4%)
Instructions for dental care during pregnancy	Yes	98 (28%)
	No	242(72%)
Signs of pregnancy gingivitis	bleeding gums when brushing the teeth	14 (4%)
	spontaneous bleeding from the gums	3 (1%)
	pain from the gums	27 (8%)
	change in color of the gums	35 (10%)
	swollen gums	24 (7%)

Table 2: Percentages of interviewed women with different oral self-care practices and dental visiting habits (N=340)

Self-care practices and dental visiting habits	N (%)
brush the teeth twice a day	65(19.1%)
brush the teeth Once a day	148(43.4%)
brush the teeth Once a week	50(14.8%)
brush the teeth less than a week	38(11.2%)
brush the teeth Less than a month	24(7%)
Never use of brush teeth	15(4.5%)
use dental floss Once a day	49(14.2%)
use dental floss Once a week	63(18.4%)
use dental floss less than once a week	47(13.6%)
use dental floss Less than once a month	38(11.1%)
Never of use dental floss	143(41.7%)
have visited a dentist during the last 12 months	108(31%)
have visited a dentist at least once a year during the last five years	164 (48%)

Table 3: The distribution of women knowledge about use of dental floss and fluoride preventive action according to level of education

		Distributions of answers (No and percent)							
		Positive		Negative		I don't know		Total	
Knowledge		No.	%	No.	%	No.	%	No.	%
Knowledge of fluoride role		163	48	51	15	126	37	340	100
Knowledge about the use of dental floss		265	78	48	14	27	8	340	100
Knowledge of fluoride role	Elementary school (n=19)	5	28	4	19	10	53	19	100
According to Level of education	Middle school (n=137)	62	45	20	15	55	40	137	100
	High school(n=131)	88	67	13	10	30	23	131	100
	College or university (n=53)	48	91	2	3	3	6	53	100
	Total	203	59	39	11	98	30	340	100

Table 4: Distribution of women by self-assessment of gingival health status according to whether or not women perceived signs of gingival inflammation

	Perception of gingival inflammation State of the gums					
	No perception of gingival inflammation (N=256)		Perceived signs of gingival inflammation (N=84)		Total	
	N	%	N	%	N	%
Very good	53	21	11	14	64	18
Good	86	33	18	22	104	31
Normal	105	41	32	38	137	40
Poor	7	3	16	18	23	7
Very poor	5	2	7	8	12	4
Total	256	100	84	100	340	100

hygiene can less dental caries and never brush their teeth. 92.2% were aware that brushing their teeth help maintain healthy gums. 36% thought that pregnancy made their teeth worse and 43% thought that early dental caries in heredity. 79% of women visited their dentist when they have problem (X^2=. 341¡ df=1¡ p=0.021). moreover finding showed that the main factor limiting regular dental visits was fear and furthermore they felt that there had no dental problem.

Finding showed that 37% of the women were regular users of the dental-care system (i.e. they had at least one dental visit per year during the last 3 years) and almost the same number of women had seen a dentist within the last 12 months.

Only 7% of the women indicated their gingival condition as being poor and 4% very poor, while 49% of women reported that their gingival status was good and very good. less than half of the women characterized their gingival condition as ‘‘normal’’, irrespective of perceived signs of gingival inflammation (Table 4).

Most of women (63%) with gingival symptoms decided to do nothing special about it. near a half of than the women (48%) informed that they improved their oral hygiene habits in response to gingival symptoms either through more frequent tooth brushing and/or more frequent use of dental floss. Women who had seen a dentist within the last 12 months were more inclined to react to symptoms or signs of gingival or periodontal inflammation compared to other women (p<0.041).

The women with higher education (university or college) clearly brushed more frequently than the others (p<0.001); younger women more often than the older women (p<0.024); housewives less often than working women (p=0.037); those who had visited a dentist during the last 12 months more often (p=0.048); and those women who had received toothbrushing instructions from a dentist more often (p=0.001). Those women who brushed more than once a day reported having dental pain less often than the others (p=0.001). Furthermore, the women brushing once a day or less often reported having only slightly more frequently periodontal problems than those brushing more than once a day.

In the logistic regression analysis, the only factors significantly associated with more-than-once-a-day brushing were: level of education, last dental visit, receiving tooth brushing instructions from a dentist or midwife and no current dental pain (Table 5).

The main reasons for seeking a dental appointment were ‘‘when treatment was needed’’ 98 women (29 %) and perceived dental pain 132 women (39 %). Only a few

Table 5: Percentages and number of pregnant women brushing more than once a day and odds ratios and their 95% confidence intervals for more-than-once-a-day toothbrushing

		Frequency				
		Frequency				
Variable		N	%	OR	CI	p-value
Level of Education	Elementary school	19	6	1		0.01
	Middle school	137	40	1.63	0.82-2.12	
	High school	131	38	1.71	1.11-2.83	
	College or university	53	16	3.14	1.8-5.28	
Current job	Housewife	48	14	1		0.511
	not working	292	86	2.58	1.43-3.28	
Last dental visit	More than 2 years ago	139	41	1		0.01
	Less than 2 but more than 1 year ago	41	12	1.45	0.93-2.83	
	6-12 months ago	98	29	2.91	1.44-3.56	
	Less than 6 months ago	61	18	3.21	1.56-5.03	
Instructions for dental care during pregnancy	Yes	248	73	1		0.028
	No	92	27	2.54	1.30-3.38	
Tooth brushing instructions	Yes	231	68	1		0.014
from a dentist any time	No	108	32	1.48	0.98-2.35	
Current dental pain	Yes	28	8	1		0.01
	No	312	92	2.24	1.05-3.62	

Table 6: Multivariate regression analyses of the dependent variable DMFT against socio demographic¡ PI and behavioral factors

			CI		
	ß	B	lower	Upper	P_{valu}
Age	0.321	0.378	0.011	0.428	0.001
Family income	-0.114	-0.089	-0.136	-0.028	0.0417
Level of education (mothers)	-0.287	-0.146	-0.431	-0.068	0.001
Coverage insurance	-0.023	-0.167	-0.192	-0.0118	0.784
Tooth brushing	-0.489	-0.578	-0.661	-0.416	0.018
Dental flossing	-0.358	-0.443	-0.566	-0.112	0.031
Self-assessment of oral health	-0.618	-1.622	-1.93	-0.417	0.016
Time since last dental visit	-0.217	-0.493	-0.586	-0.191	0.0378
Type of dental visit	-0.188	-0.359	-0.435	-0.138	0.0143

$R^2 = 0.412$ R^2 Adjusted =0.388

ß, standardized regression coefficients; B, unstandardized regression coefficients; 95% CI, 95% confidence interval.

women visited a dentist regularly for teeth cleaning 63 women(18%) and for a check-up 35 women(10%). Those women who had dental pain during the pregnancy visited a dentist more often than those who did not (39% versus 29%).

Most of the women studied (73%) had received no instructions concerning oral health care during pregnancy. Most of the women (95%) knew that tooth brushing could prevent periodontal diseases. Tooth brushing instructions were received only occasionally from a dentist (32%), most frequently by those who had visited a dentist during the last pregnancy (p=0.028). Dental health, in general, was reported to be significantly better among the women who had received tooth brushing instructions (p=0.014) (Table 5).

From those who reported poor dental health, 77% had also experienced dental pain. Every forth woman felt that they had gingival/periodontal problems at the time of the questionnaire and 12% of the respondents had experienced dental pain during the last 6 months. More than half (61%) of those who reported having problems with periodontium also reported current dental pain (p<0.001).

The multiple logistic regression analysis, including demographic variables (i.e., age, coverage insurance, level of education and etal.) accounting for 41.2% of the variance in oral health behavior (Table 6).

DISCUSSION

A lack of updated data on the oral health of women with pregnancy makes a longitudinal analysis of social and health related trends difficult in Iran.

The present study showed that mean DMFT among a sample of Iranian women with pregnancy was 5.4, which is higher than a DMFT of 2.9 reported by meurman *et al*. Among 30 years old Finland women with pregnancy [14] in accordance with a DMFT of 3.7 reported by Mansory *et al*. among 35-44 year old Iranian [15].

This difference in the incidence of caries between Finland women and Iran could be attributed to an ever increasing level of sugar consumption in Iran, since the annual sugar consumption per individual has increased from 25.1 kg in 1991 to 30.8 kg in 2005, an increase of some 22% [16]. The present study has observed a don't significant association between coverage insurance and the incidence of caries, since women with coverage insurance had a same DMFT score with others. It is assumed, however, that all women same are less concerned about oral health related issues. Moreover, these findings are consistent with previous published data [17-18].

In this study less than half the study sample (43%) reported that they brushed their teeth once a day, which shows that there exists a relatively poor brushing habit among Iranian women. A study in Saudi Arabian reported that near 73% used a tooth brush daily [19]. In the present study 4.6% of pregnant women never brush their teeth and 37% of them did not know the caries preventive role of fluoride. it is obvious that an emphasis on oral hygiene training at health centers for promotes women awareness and their hygiene behavior and knowledge. One of the most significant identified in the survey was the fact that majority of the women visited the dentist only when they have problems with their teeth.

A population-based cross-sectional study conducted in North Dakota revealed that young women, women in poverty and women with Medicaid coverage were at increased risk of not having a dentist visit during their pregnancy [9] In another study, Gaffield *et al*. analyzed Pregnancy Risk Monitoring System data from 4 states they found a modest increase in risk of dental care underused associated with poverty, Medicaid coverage and late-onset prenatal care among women who reported having a dental problem during pregnancy [6].

No studies have been conducted on oral health, perceived oral health, or oral health behaviour and knowledge among pregnant women in Iran. As mothers play a crucial role in transferring and demonstrating health habits to their children, pregnant women should be a target group for oral health education, especially in a country such as iran where the majority of the population consists of children and adolescents.

A larger proportion of women reported having normal (40%) and (31%) good dental health (total 71%). It is well documented that the changing level of female sex hormones due to pregnancy may influence the susceptibility to gingivitis [20-21].

In the present study, gingival problems were perceived by 38% of the respondents, a relatively low rate as compared to the prevalence of periodontal disease found among pregnant women in earlier clinical studies [22-23].

However, studies on the validity of self reported gingival health have shown some underestimation of disease experience when compared to clinical evaluations [24]. The most alarming finding of the present study of pregnant women in arak was that the majority had received no instructions on oral health care during their pregnancy (73%). However, those who had received instructions, not necessarily during this pregnancy but even occasionally. Similar results were found in a German study, where 71% received no information regarding oral hygiene during pregnancy [25].

In a UK study, only 25% of the women had received specific advice concerning their teeth and pregnancy, mostly related to gingival and periodontal health [26]. In a previous study of Iran mothers most often, the dental health instructions had been gained from TV, and only a few reported having received those from a dentist [27].

Contradictory findings were reported in a recent study among students at the Health Sciences Centre in Tehran (a city in Iran) where 58% of female students reported having received tooth brushing instructions and 61% of them had received these instructions from a dentist [28] This was a selected group of persons, however and as students in the field of health care, they might be more interested about health issues in general and also might discuss oral health care with a dentist more easily.

in this present study, women with cover insurance visited a dentist clearly more often than non-coverage insurance, perhaps because dental care was cheap of charge for mothers with cover insurance and little pay for dental visits. However, it is up to the women themselves to seek dental appointments, because a recall system for regular dental care is little organized in health centers. near a half of than the women in the present study

decided to respond to the gingival symptoms by intensifying their oral hygiene habits and some of pregnant women felt the need for visiting a dentist.

Such illness behavior among pregnant women in the present study was positively related to the women's dental visiting habits but no other factors seemed to influence the response to gingival symptoms. One explanation might be that the majority of the pregnant women perceiving gingival symptoms are convinced that their self-care practices in relation to oral hygiene would be sufficient for preventing and/or curing gingival diseases. The theory of self-efficacy in health behaviour was developed on the basis of the Health Belief Model [29], assuming that people tend to adopt self-care practices if they perceive that they are capable of controlling health problems. As observed in the actual study, the level of self-efficacy in oral health was moderate among the participants [30].

Among some of the participants, the state of pregnancy seems to be a ''trigger'' or ''cue to action'' in relation to oral self-care practices. Such a hypothesis of ''trigger'' or ''cue to action'' is in agreement with one theoretical explanation of health behavior red to as the Health Belief Model [29]. The ''trigger'' effect of pregnancy was also found for women who reported healthy gums. For example, in spite of no signs of gingival symptoms some of the women in the study would apparently improve their oral hygiene habits during pregnancy. On the other hand, the majority of the pregnant women in the study did not recognize any gingival or periodontal symptoms. Even those women perceiving gingival problems did not consider such a condition to be a serious problem and it appears that signs of gingival inflammation are often regarded as a ''normal'' condition. Earlier surveys have revealed that many people do not always observe gingival bleeding and many people do not even realize that gingival bleeding is a sign of inflammation [31]. A similar low than moderate awareness of gingival problems among pregnant women was found in the present study, findings that should be related to the fact that subjective signs of gingival inflammation may be signs of even more severe periodontal lesions [32].

Additionally, recent studies have pointed to an association between periodontal infection and increased rates of pre-term birth [33-34]. Periodontal disease has been associated with pre-term birth and all women eligible to become pregnant should be informed of the significance of recognizing the presence of gingival inflammation and about the importance of further diagnosis and treatment.

In this study similar to some clinical studies from other countries for example Nigeria, Spain, UK and Jordan, the association between periodontal problems and low educational/occupational status was obvious [35-36], the present study educated did brush more frequently than the less educated, which is in accordance with earlier studies. A significant proportion of the women experienced dental pain during the last 6 months and a few claimed to have periodontal problems currently, but the prevalence of periodontal problems could actually have been higher because many women who were expecting their first baby did not even have a clue about what periodontal problems mean.

Perceived periodontal problems or perceived dental pain make a difference as to whether or not the mother scheduled an appointment with a dentist. In a study in the USA [9], one-half of those women who had some dental problems during pregnancy did not receive dental care, while in Germany, 84% reported having dental care if problems appeared [25].

In the present study reasons for not seeing a dentist were the feeling that it was not necessary, fear, or not liking dentists. In the Iran, dental care is not largely government subsidized and women with lower incomes were significantly less likely to seek dental care than women with higher incomes. Regardless of the cost, weak of recall system in health centers special efforts should therefore be made to encourage pregnant women to see a dentist at least once during their pregnancy and to educate them about oral health care.

The present study indicate impaired oral health status in women Iranians with pregnancy, particularly those of low socio-economic status and educational level. The high prevalence of unmet treatment needs call for a preventive population strategy with special emphasis on the improvement of oral self-care in the Iranian women with pregnancy population. Therefor health authorities should strengthen the implementation of community-based oral disease prevention and health promotion programmers.

CONCLUSION

In the present study more than half of the women had not visited a dentist during their pregnancy and most had not received instructions concerning oral health care. Efforts should be made to educate pregnant women in oral health, especially preventive oral self-care. However, self-reported periodontal status was not confirmed by clinical or X-ray examination, which is a limitation of this study.

ACKNOWLEDGMENTS

This study was financially supported by Tarbiat Modares University in Tehran Iran.

REFERENCES

1. Petersen, P.E., D. Bourgeois, D. Bratthall and H. Ogawa, 2005. Oral health information systems-towards measuring progress in oral health promotion and disease prevention. Bull World Health Organ, 83: 686-93.
2. Margaret, W., M.S. Ingunn and O. Isaac, 2009. Socio-demographic factors related to periodontal status and tooth loss of pregnant women in Mbale district, Uganda. BMC Oral Health, 9: 18. Available from: URL: http:// www.biomedcentral.com/ 1472-6831/9/18.
3. Genco, R., S. Offenbacher and J. Beck, 2002. Periodontal disease and cardiovascular disease: epidemiology and possible mechanisms. J. Am. Dent Assoc., 133: 14-22.
4. Eslamipour, F., A. Borzabadi-Farahani and I. Asgari, 2010. The relationship between aging and oral health inequalities assessed by the DMFT index. Eur. J. Paediatr Dent. Dec., 11(4): 193-9.
5. Kleinman, D.V., 2002. The future of the dental profession: perspectives from Oral Health in America: a report of the Surgeon General. J. Am. Coll. Dent., 69(3): 6-10.
6. Gaffield, M.L., B.J. Gilbert, D.M. Malvitz and R. Romaguera, 2001. Oral health during pregnancy: an analysis of information collected by the pregnancy risk assessment monitoring system. J. Am. Dent. Assoc., 132(7): 1009-1016.
7. Vogt, M., A.W. Sallum, J.G. Cecatti and S.S. Morais, 2012. Factors Associated with the Prevalence of Periodontal Disease in Low-Risk Pregnant Women. Reprod Health. 2012 Jan 24, 9(1): 3.
8. Lamarca, G.D., M.D. Leal, A.T. Leao, A. Sheiham and M.V. Vettore, 2012. Oral health related quality of life in pregnant and post partum women in two social network domains; predominantly home-based and work-based networks. Health Qual Life Outcomes. 2012 Jan 13, 10(1): 5.
9. Mangskau, K.A. and B. Arrindell, 1996. Pregnancy and oral health: utilization of the oral health care system by pregnant women in North Dakota. Northwest Dent., 75: 23-28.
10. Haji Kazemy, E., S.H. Mohseni, S.F. Oskouie and H. Haghani, 2005. The association between knowledge attitude and performance in pregnant women toward dental hygiene during pregnancy. Iran Journal of Nursing, 18(43): 31-38.
11. Fazel, A., M.E. Akbari and M. Zayandeh, 1997. Incidence of oral and dental diseases amongst healthy individuals. Journal of Islamic Dental Association of Iran, 9(27): 36-25.
12. Khosravi, A.F., F.A. Najafi, M.D. Rahbar, Z.A. Atefy, M.I. Motlagh and M.J. Kabir, 2008. Statistical Yearbook of Iran Perspective of health indicators in Iran. 1th ed. Tehran: Network Development and Health Promotion Center-Ministry of Health and Medical Education. Summer.
13. Pakshir, H.R., 2004. Oral health in Iran. Int. Dent. J., 54: 367-72.
14. Meurman, J.H., J. Furuholm, R. Kaaja, H. Rintamäki and U. Tikkanen, 2006. Oral health in women with pregnancy and delivery complications. Clin. Oral Investig, 2006 Jun, 10(2): 96-101.
15. Mansori, T., S.M. Karkavandi, R. Tavafzadeh, M. Haghi, A. Bouzari and A. Farhady, 2004. A Comparative Study of Dental Caries Prevalence in 35-44 and 6-12 year Old Iranian Villagers and Afghan Refugees Living in Villages of Isfahan Province of Iran. Dental research journal, 1(2).
16. Ghassemi, H., G. Harrison and K. Mohammad, 2002. An accelerated nutrition transition in Iran. Public Health Nutr., 5: 149-155.
17. Bayat, F., H. Murtomaa, M.M. Vehkalahti, Tala H. Does, 2011. dental insurance make a difference in type of service received by Iranian dentate adults? Eur J Dent., 2011 Jan, 5(1): 68-76.
18. Habashneh, R., J.M. Guthmiller, S. Levy, G.K. Johnson, C. Squier, D.V. Dawson, *et al.,* 2005. factors related to utilization of dental services during pregnancy. J Clin Periodontol., 32(2): 815.
19. Meshari, A.L., Z. Mikael and A.M. Birgit, 2003. Prevailing oral hygine practice among urban Saudi arabians in relation to age gender and sicio economic background. Journal of Acta odontologica scandinavica, 61(4): 14582588.
20. Wandera, Margaret, N., Engebretsen, Ingunn, M. Rwenyonyi, Charles M. Tumwine, James, N. Åstrøm, Anne, *et al.,* 2009. Periodontal status, tooth loss and self-reported periodontal problems effects on oral impacts on daily performances, OIDP, in pregnant women in Uganda: a cross-sectional study. Health and Quality of Life Outcomes, 7(1): 89.

21. Taani, D.Q., R. Habashneh, M.M. Hammad and A. Batieha, 2003. The periodontal status of pregnant women and its relationship with sociodemographic and clinical variables. J. Oral Rehabil, 30(4): 440-445.
22. Hullah, E., Y. Turok, M. Nauta and W. Yoong, 2007. Self-reported oral hygiene habits, dental attendance and attitudes to dentistry during pregnancy in a sample of immigrant women in North London. Archives of gynecology and obstetrics, 277(5): 405-9.
23. Saddki, N., A. Yusoff and Y. Hwang, 2010. Factors associated with dental visit and barriers to utilisation of oral health care services in a sample of antenatal mothers in Hospital Universiti Sains Malaysia. BMC Public Health, 10(1): 75.
24. Cruz, Gustavo, D., Roldós, Isabel, Puerta, I. Diva Salazar and R. Christian, 2005. Community-Based, Culturally Appropriate Oral Health Promotion Program for Immigrant Pregnant Women in New York City. New York State Dental Journal, 71(7): 34-8.
25. Gunay, H., K. Goepel, K.H. Stock and T. Schneller, 1991. Position of health education knowledge concerning pregnancy. Oralprophylaxe, 13: 4-7 (in German).
26. Rogers, S.N., 1991. Dental attendance in a sample of pregnant women in Birmingham, UK. Community Dental Health, 8: 361-368
27. Hajimiri, K., G. Sharifirad and A. Hasanzade, 2010. The Effect of Oral Health Education Based on Health Belief Model in Mothers Who Had 3-6 Year Old Children on Decreasing Dental Plaque Index in Zanjan. Journal of Zanjan University of Medical Sciences and Health Services, 18(72): 77.
28. Pakpour, A.H., A. Hidarnia and E. Hajizadeh, 2010. The status of dental caries and related factors in a sample of Iranian adolescents. Med Oral Patol Oral. Journal section: Community and preventive dentistry, 1(4).
29. Bandura, A., 2000. Health promotion from the perspective of social cognitive theory. In: Understanding and changing health behaviour, eds. P. Norman, C. Abraham and M. Conner, pp: 299-342. Amsterdam: Harwood Academic Publishers.
30. Murphey, Christina and Rew, Lynn, 2009. Three Intervention Models for Exploring Oral Health in Pregnant Minority Adolescents. Journal for Specialists in Pediatric Nursing, 14(2): 132-41.
31. Diss, Radnai, 2005. Marta, Periodontitis and preterm birth: Oral health status of pregnant women in south-east Hungary Semmelweis Egyetem (Hungary), 3217000.
32. Nyman, S. and J. Lindhe, Examination of patients with periodontal disease. In: Clinical periodontology and implant dentistry, J. Lindhe, eds. T. Karring and Lang, 2000. N.P., 3rd edition, pp: 383-395. Copenhagen: Munksgaard.
33. Armitage, G.C., 2001. Periodontal disease and pregnancy: discussion, conclusions and recommendations. Annals of Periodontology/ The American Academy of Periodontology, 6: 189-192.
34. Jeffcoat, M.K., N.C. Geurs, M.S. Reddy, R.L. Goldenberg and J.C. Hauth, 2001. Current evidence regarding periodontal disease as a risk factor in preterm birth. Annals of Periodontology/ The American Academy of Periodontology, 6: 183-188.
35. Ogunbodede, O.E., A.O. Olusile, S.O. Ogunniyi and B.L. Faleyimu, 1996. Socio-economic factors and dental health in obstetric population. West African Journal of Medicine, 15: 158-162.
36. Moore, S., M. Ide, R.F. Wilson, P.Y. Coward, E. Borkowska, R. Baylis, S. Bewley, D.J. Maxwell, L. Mulhair and F.P. Ashley, 2001. Periodontal health of London women during early pregnancy. British Dental Journal, 191: 570-573.