**ORIGINAL ARTICLE**

# Knowledge, Attitude, and Practices of pregnant women regarding oral health at Railway Hospital Rawalpindi, Pakistan

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## ABSTRACT

**Aim:** To assess the pregnant women's knowledge, oral hygiene practices, perceived barriers and perceptions towards their oral health.
**Study Design:** Cross-sectional
**Place and Duration of Study:** Railway hospital, Rawalpindi between July and September 2017.
**Methods:** Overall 290 pregnant women participated in interview administered questionnaire based survey. The questionnaire consisted of 31 questions in six subsections. The questions were related to demographics, oral hygiene habits, oral health status, perceptions, and knowledge regarding oral health. Data were analysed by utilizing both in chi-square test and descriptive statistics.
**Results:** The total of 260 questionnaires were analysed. Thirty questionnaires were discarded because of missing data. Note that 38.9% of women reported current oral health problems, nevertheless, more than 75% did not consult the dentist. The major barriers in the utilization of oral healthcare service were treatment cost and low priorty for oral health. Only 26.2% of the pregnant women knew that dental treatment is safe during pregnancy and 11.9% were aware of the correct timing of baby's first dental visit. Significant correlation of the dental visits in the preceding six months was noted with perceived oral health status and information received about oral health care during pregnancy.
**Conclusions:** The study noted low priorty for oral health during pregnancy and cost of dental treatment as the main barriers in seeking the dental treatment during pregnanacy. The expectant mothers were lacking in knowledge regarding infant oral health and importance of oral health during pregnancy. Therefore, the dental health education by the media and antenatal care should be promoted.
**Keywords:** Oral health, Knowledge, Perception, Pregnancy.

## INTRODUCTION

Pregnancy is a unique time that is associated with many emotional and physiological changes (hormonal, vascular, and immunologic) in the body. The women during pregnancy are at an increased risk of certain oral diseases that can affect the general health of both mother and child[1,2]. The studies have reported that through pregnancy one in four women develop dental caries, approximately 75% are affected by gingivitis and one in three suffer from periodontitis[3,4]. The changes in hormonal levels (estrogen and progesterone) result in an inflammatory response with increased permeability of blood vessels thus leading to gingival inflammation.[5] Furthermore, if these changes are accompanied by poor oral hygiene, it can result in pregnancy gingivitis, periodontitis, and dental caries[6].

The good oral health of pregnant women will improve their quality of life, reduce the chance of potential complications during pregnancy (low birth weight baby, preeclampsia, and preterm birth) and minimize the risk of their children developing early childhood caries in future[7]. Clothier and colleagues suggested that children of women with poor oral health are at five times risk of developing the oral health problems[8]. Therefore, mothers play an important role in developing positive attitudes and lifelong practices related to oral healthcare among children[9]. The pregnancy is considered an ideal time for behavioral interventions because women can be more easily motivated to change their negative habits in anticipation of its negative impact on themselves and on the baby[10].

While adequate oral health has now been recognised as an essential component of the overall well-being of pregnant women in developed countries, in developing countries it is still an ignored issue. Considering the significance of optimal oral health during pregnancy and the potential affect of the expectant mother's oral health on the infant oral health, it is of significant importance to understand pregnant women's oral health related knowledge, perceptions, and behaviours in developing countries like Pakistan, with limited resources for oral health care services[11]. Considering this the objectives of the study was to to assess the pregnant women's knowledge, oral hygiene practices, perceived barriers and perceptions towards their oral health.

## MATERIALS AND METHODS

The cross-sectional questionnaire based study was carried out at Railway hospital, Rawalpindi, Pakistan between July and September 2017. The ethical approval was obtained from the institutional review board (IIDC/IRC/2017/06/001). The pregnant women visiting the antenatal clinic for their routine appointments were included in this study with consent. The women who showed unwillingness to

participate were excluded from the study. The participants were recruited through a convenience sampling strategy.

The study adopted a prevalidated questionnaire from George et al, with minor modifications[12]. The questionnaire consisted of 31 questions that were divided into six subsections. The first section (questions 1-7) had questions to collect demographic information. The second section (questions 8-17) was comprised of questions related to current dental health status. The oral hygiene habits (questions 18-19), perception (questions 20-21), and knowledge of oral health (questions 22-24) were assessed in the third, fourth, and fifth sections, respectively. Question 22 had eight subquestions in true/false format. The last section explored access to dental care services (questions 25-31).

Three trained female dentists completed the interviewer-administered questionnaires from the participants. Female interviewers were selected because of cultural limitations to facilitate communication between the participants and the interviewers. Participants were approached in the waiting room of the antenatal clinic. Before collecting the data all the study participants were verbally explained the purpose of the research. The written consent was obtained from the pregnant women who agreed to participate. Subsequently, the interviewers completed interviewer-administered questionnaires from the participants in a private room. The average duration of the interview was 20 minutes. If the study participant refused to answer any question during the interview it was recorded as missing information and the questionnaire was considered incomplete and discarded.

The data collected were analysed by utilizing SPSS version 23. Descriptive statstics were used to summarise the data using frequency and percentages. Moreover, chi-square test was utilized for comparing the profiles of those pregnanat women that consulted their dentists in the preceding 6 months with the one who did not. A *p*-value of <0.05 was considered as significant. The knowledge questions were marked against the current evidence based literature.[12]

## RESULTS

Overall 290 pregnant women consented to participate in the data collection phase. Due to incomplete questionnaires, 30 subjects were omitted from the study, and the remaining data of 260 subjects were used for the final analysis. Most of the pregnant women (81.9%) were in the age range of 18 to 30 years. More than half of the study participants (52.6%) were in the last trimester of pregnancy and 45% were expecting their first baby. Moreover, 93.5% of the study sample was unemployed and 95% of women did not have health insurance. In relation to the educational background, almost half (48%) had primary to high school education.

Oral health status as perceived by the pregnant women and their dental care practices are presented in Table-1. Current oral health issues were reported by 38.9% of the women. The bleeding gums were the most commonly reported problem at 52.3%. 36.2% of women stated that dental problems had adversely affected their eating and hence general health. However, 75% of the women with oral problems did not consult the dentist. Overall, 16.9% of the expectant mothers visited dentists in the past 6 months. The most significant barriers in the utilization of oral health care service were the treatment cost and expectant mothers' low priority for the oral health. Furthermore, more than half (58.1%) of the women brushed teeth two or more times and 97.7% used fluoridated toothpaste. Three quarter of the women claimed that their oral health status is average to excellent (75.4%). Moreover, 58.9% of the participants admitted that their dental health is important and 77.3% of pregnant participants considered their baby's oral health important.

Table-2 shows the oral health related knowledge of participants. Only 29.2% women knew that carious teeth in babies are a serious issue. Furthermore, 26.2% of the pregnant women were mindful of the fact that dental treatment is safe during pregnancy and 11.9% of women were aware of the correct timing of the first dental visit for the infant. Conversely, 84.2% of women knew that routine dental visits are important to keep gums and teeth healthy.

The participants responses related to access to dental care services and attitude for participation in oral health services are presented in Table-3. Only 15% of the pregnant women were informed about the significance of oral health during pregnancy. 45% of participants reported that accessing dental care services during pregnancy was difficult/very difficult and 86.2% of women were of the view that gynecologists can help pregnant women in identifying oral health problems. Furthermore, 80.7% of women allowed that gynecologists can check their teeth during antenatal visits and refer them to a dentist if necessary and 71.9% of women suggested that educational material and products should be given at first antenatal visit. Lastly, 43.5% of women preferred accessing educational services and free dental treatments at a hospital clinic.

The significant association of the dental visits in last 6 months was noted with the expectant mothers perceived oral health status and oral healthcare information women received during pregnancy (Table-4).

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Table-1: Pregnant Women's Perception of their Oral Health Status and their Dental care practices (n=260)

| **Oral health status Variables** | **Frequency(%)** | | | | | |
|---|---|---|---|---|---|---|
| Self-perceived oral health status | Excellent | Good | Average | Fair | Poor | |
| | 21 (8.1 %) | 93 (35.8 %) | 82 (31.5 %) | 49 (18.8 %) | 15(5.8 %) | |
| Self reported oral health problems | No problem | One problem | Two or more problems | | | |
| | 159 (61.1 %) | 57 (22 %) | 44 (16.9 %) | | | |
| Type of oral health problems (n=101) ‡ | Bleeding gums | Toothpain | Cavities | Loose teeth | Sensitivity | Teeth don't look right |
| | 53 (52.3 %) | 42(41.6%) | 18 (17.8 %) | 6 (5.9 %) | 33 (33%) | 4 (3.9 %) |
| Have you seeked advice from a dental professional for problem (n=101) | Yes | No | | | | |
| | 25 (24.75%) | 76 (75.25%) | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Dental problems affected what to eat and overall health in general | Never | | Sometimes | | Often | |
| | 166(63.8%) | | 32 (12.3%) | | 62(23.9%) | |
| Importance of oral health as compared to overall health | Not important | Little important | Neutral | Very important | Extremely important | |
| | 19 (7.3%) | 50 (19.2%) | 38 (14.6%) | 61 (23.5%) | 92 (35.4%) | |
| Importance of baby's oral health | 24 (9.2%) | 20 (7.7%) | 15 (5.8%) | 38 (14.6%) | 163 (62.7%) | |
| **Dental care related Variables** | **Frequency(%)** | | | | | |
| When was the last time you saw a dentist? | <6months | 6to<12months | 1yr to <2yrs | 2yrs to <5yrs | >5yrs | Never visited |
| | 44 (16.9 %) | 21 (8.1 %) | 22 (8.5 %) | 26 (10 %) | 27 (10.4 %) | 120(46.2%) |
| Barriers in seeking dental treatment (n= 76)‡ | Safety concerns during regnancy | Dental treatment costs | Time limitations | Low priorty for oral health | Advise against treatment by antenatal carers | |
| | 26 (24.1%) | 47 (43.5%) | 0 (0%) | 30 (27.7%) | 5(4.6%) | |
| How frequently do you perform tooth brushing? | Few times per week | Daily once | Daily twice | Daily>twice | Don't brush | |
| | 15 (5.7%) | 91 (35 %) | 144 (55.4 %) | 7 (2.7 %) | 3 (1.2 %) | |
| Oral hygiene products used‡ | Flouride toothpaste | Mouthwash | Dental floss | Sugar free gum | | |
| | 254 (97.7 %) | 20 (7.7 %) | 3 (1.2 %) | 1 (0.4 %) | | |

‡ Muliplte responses

Table-2: Oral health related knowledge of the participants

| **Item Content** | **Correct Responses %** |
|---|---|
| Flossing must be done everyday for cleaning between teeth [T] | 46.9 % |
| Regular dental check ups help to keep gums and teeth in good health [T] | 84.2 % |
| Pregnant women should seek dental treatment only in case of emergency [F] | 26.2 % |
| Dental cavities and decay can spread to child's mouth from the mother [T] | 61.5 % |
| Poor oral health of mother may be the contributory factor towards the low birth weight of baby [T] | 63.1 % |
| First baby tooth usually emerges at around six months of age [T] | 78.8 % |
| Sleeping with formula milk containing bottle could lead to holes in baby's teeth [T] | 76.2 % |
| Its Ok to have cavitations on baby's teeth as they will shed anyway [F] | 29.2 % |
| What is the best time period for a child to have their 1st visit to dentist? [Before the first birthday]† | 11.9 % |
| A baby child drops a pacifier on the floor. The mother puts it in her mouth to clean it and then puts it in her baby's mouth: Is this ok or not ok to do? † [Not ok] | 91.2 % |

† Multiple choice questions, T= True, F= False

Table-3: Access and attitude for participation in oral health services.(n=260)

| **Variables** | **Frequency (%)** | | | | |
|---|---|---|---|---|---|
| Have you received information about oral health during pregnancy | Yes | | No | | |
| | 38 (14.6%) | | 222 (85.4%) | | |
| Where have you received this information from | Gynecologist | Dentist | Family | Commercial | |
| | 24 (63.2%) | 8 (21.1%) | 5 (13.1%) | 1 (2.6%) | |
| Advice from gynecologist regarding oral health | OHI* | Visit a dentist | Nothing | | |
| | 19 (7.34%) | 5 (1.92%) | 236 (90.77%) | | |
| Ease of accessing dental care during pregnancy | Very easy | Easy | Neutral | Difficult | Very difficult |
| | 18 (6.9%) | 36 (13.8%) | 89 (34.2%) | 56 (21.5%) | 61 (23.5%) |
| Do you think gynecologists could assist you to identify oral health problems during pregnancy? | Yes | | No | Don't know | |
| | 224 (86.2%) | | 17 (6.5%) | 19 (7.3%) | |
| Would you seriously consider dental advice given by gynecologists? | 243 (93.5%) | | 6 (2.3%) | 11 (4.2%) | |
| Would you be willing to take precautions to maintain your oral health during pregnancy? | 241 (92.7%) | | 4 (1.5%) | 15 (5.8%) | |
| How likely are you to participate in these services, if they were provided? | Very unlikely | Unlikely | Neutral | Likely | Very likely |
| Gynecologists asking you questions about your oral health | 3 (1.2 %) | 1 (0.4%) | 39 (15%) | 97 (37.3%) | 120 (46.2%) |
| Gynecologists offering you dental advice | 3 (1.2%) | 1 (0.4%) | 28 (10.8%) | 88 (33.8%) | 140 (53.8%) |
| Gynecologists providing you with dental products | 2 (0.8%) | 2 (0.8%) | 33 (12.7%) | 101(38.8%) | 122 (46.9%) |
| Gynecologists checking your teeth during the antenatal checkups and if required, referring you to a dentist | 7 (2.7%) | 8 (3.1%) | 35 (13.5%) | 88 (33.8%) | 122 (46.9%) |
| Dental professionals providing free dental treatment & educational services for pregnant women once a month | 7 (2.7%) | 5 (1.9%) | 30 (11.5%) | 88 (33.8%) | 130 (50%) |
| Best time to receive educational material and dental products is during | 1st antenatal visit | 1st Trimester | 2nd Trimester | 3rd Trimester | |
| | 187(71.9%) | 31(11.9%) | 38(14.6%) | 4(1.5%) | |
| Suitable time to access dental treatments is during | Weekends | | Weekdays | | |
| | 199(76.5%) | | 61(23.5%) | | |
| Where would you prefer to access free dental treatments/educational services | Hospital Dental Clinic | Any clinic with easy access | Clinic near home | | |
| | 113 (43.5%) | 58 (22.3%) | 89 (34.2%) | | |

*Oral Hygiene Instructions

Table 4: Association of Dental visits of pregnant women in the preceding 6 months with educational level, employment status, oral health information, and status.

| Variables | Dental visits in preceding 6 months | | Df | P-value* |
|---|---|---|---|---|
| | Yes n=44 | No n=216 | | |
| **Highest educational level** | | | | |
| Primary school | 6 | 30 | 6 | 0.17 |
| Secondary school | 6 | 48 | | |
| High school | 4 | 30 | | |
| Religious institution | 4 | 7 | | |
| College | 9 | 42 | | |
| University | 13 | 37 | | |
| No education | 2 | 22 | | |
| **Oral health status** | | | | |
| Excellent | 7 | 15 | 4 | 0.00 |
| Good | 27 | 74 | | |
| Average | 8 | 64 | | |
| Fair | 1 | 46 | | |
| Poor | 1 | 17 | | |
| **Oral Healthcare information received during pregnancy** | | | | |
| Yes | 16 | 22 | 1 | 0.00 |
| No | 28 | 194 | | |

*Statistically significant (<0.05).

## DISCUSSION

The current research explored the knowledge, habits, and perceptions of pregnant women in relation to their oral health. Additionally, the study has revealed their current oral health status, barriers in accessing dental services and predicted the future scope of oral health intervention programs via gynecologists for pregnant women in Pakistan.

The findings suggested that limited number of expectant mothers visited the dentist. The result was consistent with the outcomes reported in the previous studies conducted in both developing and developed countries despite cultural, economic, and social differences.[13-15] Nearly 40% of women in the present study reported having some oral health problems but only one-fourth consulted the dentists. This might be attributed to expectant mothers' low priorty for oral health during pregnancy. The outcome was in line with the findings of the study by Sukkarwalla and Colleagues.[16] The inability of the pregnant women to seek dental treatment might be the result of their underestimation of dental condition though many women highlighted the cost of dental treatment and safety concerns as the barriers to seek dental health care during pregnancy.

Dental treatment cost is a common problem faced by pregnant women from low socioeconomic background.[17] Likewise, the majority of the women in the current study were either unemployed or had low annual household income. Consequently, more than 80% of the women showed interest in seeking free dental treatment during pregnancy. The dental treatment cost is a more worth mentioning hurdle for pregnant women in Pakistan than in some developed countries because several dental programs in the UK and the USA are currently offering affordable dental treatment to pregnant women.[18,19] However, in Pakistan, there are no such programs. Moreover, only a limited number of health facilities offer affordable dental treatment and those that offer had long waiting lists.[11] Another factor in not seeking dental treatment during pregnancy might be lack of oral health awareness.[17,20] Recent study in Malaysia reported that mostly those pregnant women who received oral health education from their health care providers and were aware of the adverse consequences of poor oral health of mother, visited dentists during pregnancy.[21] The other barrier mentioned was the safety concerns (24.1%) regarding oral treatment during pregnancy. Likewise, 26% of women in Finland thought that the normal development of the fetus might be affected by undergoing dental treatment during pregnancy.[22] Whereas nearly 75% of women in other studies shared similar opinion.[13] Therefore, adequate information on the significane of adequate oral health and safety of dental treatment procedures during pregnancy is required in order to enhance the oral health of pregnant women.

The information regarding oral health provided by gynecologists and dentists in this study contradicts with the result of a study in Iran where television was the principal source of gaining information.[23] Considering the significance of the early detection of oral health problems and their treatment, it is imperative that the gynecologists should play a more active part to promote oral health care amongst pregnant patients as indicated in international guidelines[24].

In view of the oral health practices, 55.4% women stated that they brushed their teeth twice daily. This finding was less than that reported by Hullah et al where 73.7% of the pregnant women brushed their teeth twice daily[25]. Conversely, Sajjan et al noted that only 36% of the participants brushed teeth twice a day[26]. These differences can be due to preventive oral health care programmes in the developed countries that were introduced to improve the knowledge of people about common oral conditions and how they can be prevented[27]. It is also worth mentioning that most pregnant women in this survey used fluoridated toothpaste. This is particularly important to reduce the incidence and prevalence of caries in resource-poor settings[28].

Generally, it is assumed that health practices are associated with knowledge and a higher level of knowledge leads to healthy health behaviours.[29] However, in our study

sample only limited relationship was noted between oral health knowledge and practices. While nearly half of women (46.9%) knew that dental floss should be used daily only a few practiced (1.2%). In addition, although a large proportion of women agreed that dental check-ups should be done during pregnancy only a limited number of women visited a dentist for their dental problems.

Overall the majority of the participating women had an average knowledge in relation to oral health of expectant mothers and infants whereas some women exhibited poor knowledge, this might be because the sample had limited number of university graduates. The findings were in line with the past studies[1,13]. Nevertheless, this area needs further research. The study explored perceptions of women about the potential role of antenatal care providers in providing preventative oral health services during pregnancy[20]. In this study more than 90% of women were supportive of the idea that gynecologists should inquire about their oral health, and if required refer them to a dentist. The results of the study indicated the potential success of the oral health care program for expectant mothers by including antenatal care providers in Pakistan, where there are no comprehensive guidelines on the oral health during pregnancy.

The current research has some limitations. The sample was comprised of pregnant women attending the antenatal clinic of one teaching hospital in Rawalpindi, Pakistan. Therefore, discreet approach should be employed while generalizing the findings of the study. A future study could consider including a larger sample size with a wider geographical area for wider use in Pakistan. Nevertheless, current study highlighted some additional areas that needs to be further investigated. These include: (a) effect of different educational interventions on the utilization of oral healthcare services during pregnancy, (b) assessing the effect of oral health intervention in the pregnant women on the onset of early childhood caries among their children.

## CONCLUSIONS

The study noted low priorty for oral health during pregnancy and cost of dental treatment as the main barriers in seeking the dental treatment during pregnanacy. The expectant mothers were lacking in knowledge regarding infant oral health and importance of oral health during pregnancy. This resulted in the low uptake of oral healthcare services by the pregnant women for their oral health problems. The poor knowledge could be the result of lack of oral health education programs from the antenatal care providers (gynaecologists and midwives). Therefore, the dental health education by the media and antenatal care providers should play a pivitol role for educating the expectant mothers regarding good oral hygiene practices and significane of infant oral health.

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