Prenatal Oral Health Care and Dental Service Utilization by Pregnant Women: A Survey in Four Maternity Centers of Gulshan Town, District East, Karachi

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OBJECTIVE: To evaluate self-reported oral health status, investigate the factors responsible for lack of pregnant women utilization of dental services and assess their vulnerability to develop oral diseases.

METHODOLOGY: In this cross-sectional study, 183 pregnant women were recruited by systemic sampling technique from four maternity centers of Karachi. The study participants filled out structured questionnaires, followed by oral examination. For data analysis, chi-square and binary logistic regression were used with the help of SPSS version 21.

RESULTS: The age and monthly income of pregnant women showed statistically significant relationship with self-reported oral health status (p<0.05), whereas level of education showed statistically significant relationship with dental service utilization (p<0.05). Most common symptoms were dentine hyper-sensitivity (38.2%), dental caries (12.5%), halitosis (31.1%) and pain (20.7%).

CONCLUSION: Financial barriers and training were found to be the primary factors for lack of utilization of dental services.

KEYWORDS: Oral health status, pregnancy, dental services, oral disease


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INTRODUCTION

A healthy society is dependent on health of mothers who nurture their future generations. It is commonly acknowledged that good oral health knowledge is a precursor of good oral health behavior. According to WHO, oral health is one of the most important public health concerns and should be addressed seriously. Pregnancy is a dynamic condition of female body causing a number of physiologic changes. These physiologic changes lead to numerous oral conditions shown in figure 1. Good maternal health is certainly one of the important determinants in lowering rate of pregnancy related complications. Improving oral health during pregnancy not only proves to be supportive but also decreases pregnancy related complications like pre-term birth, pre-eclampsia, morbidity and mortality of infants.

Studies show that 50% of pregnant women develop oral diseases. It has been shown that bacteria (Mutans-Streptococci MS) is responsible for early childhood caries, transmitted from mother’s saliva and rate of transmission increase if she bears poor oral hygiene with untreated dental caries. Other predisposing factors are poor diet, alcohol, smoking, betel nut chewing and gutka consumption. These factors affect both general and oral health. Most common barriers
found among these women for not seeking dental consultation being not prioritizing oral hygiene and diseases, lack of insurance packages and finance, lack of education, and lack of guidance during antenatal period among these women. One of the factors responsible for less concern towards oral health in pregnant women is lack of knowledge about the impact of oral diseases on their health and safety during the pregnancy.

Certain myths associated with dental treatment during period of pregnancy not being safe for fetus result in reluctance towards seeking dental treatment. Pregnancy induced hormonal and nutritional conditions predispose these women to greater risk of developing complications for both mother and fetus, especially in situations where women before pregnancy are already in partial compliance of oral hygiene practices. During pregnancy, different functions of saliva like buffering, immune and cleaning mechanism decrease with reduction in salivary content. However, in many cases, women wrongly perceive these changes as normal, thus abstain in seeking dental consultation. Moreover habits such as smoking, drinking alcohol and poor oral hygiene have a significant impact on pregnant women's oral health. Ectopic pregnancy, spontaneous abortions and preterm delivery are considered to be complicated outcomes of pregnancy due to smoking habit of mothers. Many studies state that chewing betel quid is one of the ill habits, common among South Asians, has proven to increase the incidence of gingival tissue inflammation among pregnant women. Lack of proper health facilities and pregnancy induced changes make these women not only more vulnerable to oral diseases but their pregnancy outcomes as well. There is a need of promoting dental counseling and addressing dental problems by gynecologists and dentists. If left untreated, these oral conditions may negatively affect the health of the fetus and may result in complications such as premature birth with low birth weight. Several misconceptions about oral treatment during pregnancy and the low rate of use of dental services during pregnancy tend to be addressed at different levels through different interventions. An important factor responsible for pregnant women abstaining from seeking dental services is the role of gynecologist who may not emphasize oral health care during pregnancy. The prevalence of poor oral hygiene as a result of nausea and vomiting during pregnancy is very high. It was previously reported that gynecologists treat complaints of nausea and many of them are aware of oral health impact during pregnancy. Therefore, this study was designed to evaluate self-reported oral health status, investigate the reasons responsible for lack of dental services for pregnant women and assess pregnant women's vulnerability to development of oral disease.

**METHODOLOGY**

The target population recruited for this study was pregnant females receiving antenatal care in four enlisted hospitals situated in Gulshan Town, District East of Karachi. Those four hospitals were Jamal Noor hospital, Al-Mustafa Medical Center, Anis Bantva Hospital and Memon Medical Institute. The pregnant women included in the study filled out structured questionnaires, followed by oral examination. Included in the study were women who were confirmed pregnant of any trimester and willing to participate. This study excluded females over 40 years of age and diabetics. The calculated sample size was 183. The prevalence of dental service utilization was found in 13% in a study conducted among pregnant women.

Systemic sampling technique was applied in this study. Every second patient was recruited for study on basis of their registration number in maternity center. The primary investigator collected the data. Questionnaire used to collect responses was formulated into both Urdu and English languages. Data collection was done from March to April 2018. Informed consent was taken from the participants and the structured questionnaire consisted of two appendixes was used to collect data. In appendix 1, demographic data, pregnancy related questions. For assessing vulnerability, Andersen- and Newman's framework-based questions consisting of psycho-social characteristics, i.e. living with difficulty, someone to help and talk, feeling depressed or happy and medical insurance were included. Appendix 2 consists of dental focused questions - i.e.; self-reported oral health, dental service utilization, oral symptoms felt during conception and use of dental services during pregnancy. Oral examinations were performed using mouth mirrors, torch and dental explorer number 3. Simplified Oral Hygiene Index was used for examination and evaluation. Each index tooth i.e. (four posterior and two anterior; 16, 26 buccal surfaces, labial surfaces of 11, 13 and lingual surfaces 46, 36) were examined. At the end of the examination, each participant was counseled and guided for needs and treatment options during the course of pregnancy.

**ETHICAL CONSIDERATION**

The Ethical approval was obtained from the Ethical Review Committee of SZABIST. Legitimate evaluation and appraisals from all mentioned maternity settings were taken. The confidentiality of the participants was also maintained by replacing all data with codes and no identification information was retained, stored in a password-protected file.
STATISTICAL ANALYSIS

SPSS version 21 was used for statistical analysis. After subsequent information was outlined from questionnaire, frequencies of various factors were computed. Chi-square test was performed for both dependable variables with each independent variable. Binary logistic regression was applied to assess vulnerability for psychosocial variables.

RESULTS

The results of this study show that age, income and education are positively associated with self-reported oral health status (p<0.05). Age, income and education level of study participants is described in Table 1. Table 2 shows the difference between oral health perceived by these women and actual state of oral health revealed after oral examination.

![Figure 2: Dental perception during pregnancy](image)

![Figure 3: Perception of mothers for oral health impairment because of pregnancy](image)

Participants who had never visited a dentist needed oral treatments compared to those who had history of dental service utilization. Majority of them had poor oral health

![Table 2: Actual oral health status](image)

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>GOOD OR Excellent (%)</th>
<th>FAIR OR Poor (%)</th>
<th>Total Frequency (n)</th>
<th>%</th>
<th>P value</th>
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<tr>
<td>AGE</td>
<td></td>
<td></td>
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<td>33</td>
<td>46</td>
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<tr>
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<tr>
<td>&gt;30 (30 TO 40 YEARS)</td>
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<td>71</td>
<td>98</td>
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<td>40</td>
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<td>54</td>
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<tr>
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<td>25</td>
<td>32</td>
<td>57</td>
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<td>&gt;50,000</td>
<td>18</td>
<td>14</td>
<td>32</td>
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<td>DENTAL SERVICE UTILIZATION</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHARACTERISTICS</td>
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<td>NEVER USED</td>
<td>Total Frequency (n)</td>
<td>%</td>
<td>P value</td>
</tr>
<tr>
<td>EDUCATION</td>
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<td></td>
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<tr>
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<td>24</td>
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</tr>
<tr>
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<td>25.1</td>
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<tr>
<td>Graduation</td>
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<td>14</td>
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![Table 3: Odds ratio of significant association psychosocial characteristics](image)

<table>
<thead>
<tr>
<th>Psychosocial variable with dental service use</th>
<th>Odds ratio</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>Hometown (yes vs. no)</td>
<td>2.7</td>
<td>1.4-5.1</td>
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<tr>
<td>Living difficulty (yes vs. no)</td>
<td>3.5</td>
<td>(1.5-8.2)</td>
</tr>
<tr>
<td>Gutkaa (yes vs. no)</td>
<td>2.6</td>
<td>1-6.9</td>
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</table>

<table>
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<th>Psychosocial variable with self-reported oral health status</th>
<th>Odds ratio</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>Hometown (no vs. yes)</td>
<td>4.9</td>
<td>2.1-11.22</td>
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<tr>
<td>Depressed (no vs. yes)</td>
<td>2.2</td>
<td>1.1-4.1</td>
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</tbody>
</table>

status (Figure 5). Vulnerability of antenatal mothers was assessed by calculating odds ratio of the variables with significant results in chi-square test showed significant results. Women who were living at their hometown exhibited significant association for both self-reported oral health and dental service utilization (Table 3). Antenatal mothers
suffering from stress were more likely (OR 2.2) to report poor oral health as compared to those with no or low stress. These mothers reported living in difficulties with lack of income low access to dental services and lack knowledge of attending dental health services. Their living conditions made them 3.5 times more at risk of developing oral disease than those who did not report any difficulty. Mothers who consumed Gutka were poor at dental service utilization (OR 2.6). Residents of Karachi were four times less vulnerable than non-residents women. Study participants who reported feeling down and depressed during the last month of pregnancy were found to be 2.2 times more at risk of oral health diseases than women not depressed during the last month of pregnancy. Self-reported oral health complaint of study participants are described in Figure 6.

**DISCUSSION**

Oral health is a public health concern and it impacts not just an individual but the society at large. In pregnant women, it is commonly observed that hormones increase up to 10 - 30 folds and ultimately induces physiologic changes in body. Therefore, oral health care is also necessary as other essential needs of health assessment during pregnancy. The results strongly suggest that income, education and age has a significant impact on self-reported oral health status of pregnant women. The socio demographic and psychosocial factors play a great role on the quality of life. The results of this study show that women with better oral health status were among those who utilized dental health-care services and they were more educated about the oral health issues. A similar study conducted in Eastern China and South Australia revealed that education is a key to proper oral health care. The same results were also observed in studies conducted in Eastern China and South Australia, revealing that education is one of the main factors responsible for proper oral care in antenatal mothers. This study shows that self-reported oral health status is influenced by age. For example, oral health status among women age greater than 30 years is better as compared to those below 30. A similar association was also found in a study conducted in China on utilization of dental services which shows that women above 36 years old have better oral health outcomes than younger ones. Income is a third and most significant factor responsible for better quality of life. Studies conducted in Karachi, Pakistan and UNC Chap Hill found that dental service utilization was found 13% and finance was considered the main barriers for not seeking dental services. Dental treatments are no doubt found to be most costly treatment. Thus, it makes it difficult to afford. Deferring from seeking dental services due to this reason has been reported in many studies. One of the studies suggests that 27% participant delayed utilization of dental services due to cost. In our study, 32% mothers report that they avoided treatment due to the cost (Figure 2) and almost half of them seek dental consultation only on emergency (Figure 4). Women are considered more vulnerable to oral health issues during pregnancy. In order to assess this vulnerability, Anderson and Newman framework from a study conducted in British Columbia was used to identify personnel and societal factor that affect one's health outcomes, perceived behaviors and health service utilization. In the context of our study, given the...
Pakistan’s culture, factors such as hometown, depression, living conditions, low income leading to the consumption of gutka and other substance abuse - were found to impact oral health behavior. Given that Karachi is a metropolitan city, people throughout the country try to settle and access a better living here. This study observed that mothers who are not permanent residents of Karachi were at risk of oral health issues compared to those mothers who are resident. Certain culture specially in South Asia have ill habits of eating betel quid. Previous studies have suggested that woman with this habit have higher incidence of inflammation of gingival tissues.  

Although smoking was not reported by majority of study participants, yet the intake of tobacco in the form of gutka was highly reported, especially among low socioeconomic participants with strong association with poor dental service utilization. While living with poor financial means creates barrier towards availing dental services, it also creates stress adversely impacting on general and oral health equally. Stress increases level of glucocorticoid secretions in the body; increases vulnerability of developing disease like periodontitis by impairing immune functions of the body. This study finds a remarkable relationship between poor oral health and feeling down and depressed. Oral examinations were conducted by interview in this study, which is a limitation of this study. However, actual intra oral examination may demonstrate the real need of treatments among targeted population. (Figure 5) & (Table 2). Better oral hygiene index was found among mothers who avail dental services as compared to those who did not.

CONCLUSION

This study revealed barriers for oral health care service utilization and perceived oral health status among antenatal mothers in Gulshan town, Karachi. Education, income and age were found to be main factors affecting the utilization of dental services during pregnancy.

CONFLICT OF INTEREST

None declared

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