



ORIGINAL ARTICLE

Gender-specific oral health beliefs and behaviors among adult patients attending King Abdulaziz Medical City in Riyadh

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KEYWORDS

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Abstract *Aim:* To explore variations in males' and females' oral health beliefs and behaviors and to assess the influence of oral health beliefs on their related behaviors within each gender.

Materials and methods: A cross-sectional study was designed to obtain information from patients attending outpatient clinics of King Abdulaziz Medical City, Riyadh, Saudi Arabia. Of the 553 self-reported questionnaires, 519 were filled comprising 251 males and 268 females. The questionnaire consisted of two parts: six demographic questions and 25 questions assessing oral health beliefs and behaviors. The statistical analysis was done using frequency distribution and chi square tests.

Results: Comparing males with females, there was no significant gender difference in beliefs. However, when it comes to behaviors, females were found to act more positively than males in many assessed oral health aspects of the study. When comparing beliefs versus behaviors towards the importance of oral health styles, a gap of 12–45% was noted between those “who believe of oral health behaviors” and those “who actually practiced them”.

Conclusions: The study presented valuable information about the differences between beliefs and behaviors of Saudi population. It also indicated that females in general, acted more positively toward oral health than males. Health care providers might need to focus more on the improvement of oral health behaviors and practices especially among males. The real reasons for lack of behav-

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iors need further investigation. Furthermore, oral health campaigns should switch focus from people's education to oral health practices and actions.

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1. Introduction

Throughout the last decade, there has been plethora of studies exploring the impact of gender on oral health status (Mamai-Homata et al., 2016). However, studies comparing gender differences impact specifically on oral health beliefs and behaviors are lacking.

The scientific literature reports that patients from certain underdeveloped countries had poor oral health beliefs and practices (Mamai-Homata et al., 2016; Kateeb, 2012; Singh et al., 2014; Fukai et al., 1999; Al-Omari and Hamasha, 2005). A study done in Japan related to the impact of gender differences on oral health behaviors and general health habits in an adult population showed that females exhibited better behaviors than males. About 53% of men had not visited the dentist in the past year compared to 37% of the women in the same sample (Fukai et al., 1999).

In another study (Singh et al., 2014), half of the subject (48%) had never visited the dentist before and (47%) preferred using other cleaning aids over the tooth brush. Furthermore Singh et al. (2014) found that approximately 32% of the subject believed that there is no relation between general and oral health, while 34% thought that tooth loss is a natural phenomenon of aging. Al-Omari and Hamasha "in" 2005 assessed the gender differences in oral health knowledge, attitude and behavior among 375 undergraduate dental students using the modified Hiroshima University Dental Behavior Inventory (HU-DBI). They found that female students brush their teeth more, smoke less and visited dentists more often. Similarly, Kateeb (2012) using the same sample and methodology found that female dental students had more positive oral health attitude and behavior than male students.

Reviewing the dental literature, studies assessed gender differences in oral health behavior and attitude in the Middle East are scarce and limited to dental students (Al-Ansari and Honkala, 2007; Farsi et al., 2004; Baseer et al., 2012). Despite the increased interest in gender differences in oral health beliefs and behaviors, no study was found to address this issue among Saudi population.

Attributable to lack of understanding of the gender differences in beliefs and behaviors among Saudi population, the present study aimed at exploring male and female beliefs and behaviors toward oral health and to assess the influence of oral health beliefs on the oral health behaviors within each gender.

2. Materials and methods

This cross-sectional study was conducted in patients of King Abdulaziz Medical City of the National Guard in Riyadh. The target sample population was adult out-patients from various medical departments of the hospital. Patients under age of 18 years, mentally or physically disabled or pregnant women were excluded. The assessment tool was a self-reported questionnaire. This project was approved by the Institutional

Review Board of King Saud bin Abdulaziz University for Health Sciences and permission to conduct the study was obtained from the administration of King Fahad Hospital of National Guard Health Affairs. A small pilot study of 50 patients was conducted and participants were invited to fill the questionnaire. Their answers to the questionnaires were discussed and modified before the start of this study.

The questionnaires were prepared in Arabic language and designed to include two main sections; demographic section and beliefs and behaviors section. Demographic characteristics explored were gender, age, occupational status, smoking, income, educational level and systemic disease. The second section consisted of 25 questions assessing patients' beliefs and at the same time their behaviors toward their oral health. Such practices included: plaque control (brushing, flossing and miswaking), diet control, dental visits, and action taken about some of their oral diseases (halitosis, gingival bleeding, and malocclusion). Questions related to beliefs were asked in the yes and no format. For example: Do you think that visiting the dentist in annual basis for checkup is necessary? While questions related to behaviors were answered in numerical values. For Example: When was the last time you have visited dentist for checkup?

The questionnaires were distributed to the patients while they were sitting in the waiting area of radiology, laboratory, pharmacy, ophthalmology, oncology and employment clinics of the hospital after taking their consents. One member of the research team was with the participants while they were filling out the questionnaire in order to explain the purpose of the study and make sure that participants understood completely the questions. The patients were informed that they have the complete right not to answer any question they did not like to answer.

Data was entered, cleaned and analyzed using SPSS statistical program version 22 (IBM Inc., Chicago, IL, USA). Simple descriptive statistics as frequency distributions, means and percentages were calculated for the study variables. Chi-square tests were used to assess the relationship between the study variables and demographic variables. The p value was considered significant if it was equals or below 0.05.

3. Results

A total number of 553 questionnaires were distributed to patients. The final sample size of completely filled questionnaires comprised 519 participants with 251 males and 268 females leading to a response rate of 94%. Two-thirds of participants were under the age of 35 years. Half of them had bachelor degree or higher and their monthly income ranged between SR5000-15000. On the other hand, only 15% of the subjects were smokers or having systemic diseases (Table 1).

The males' and females' oral health beliefs and behaviors are presented in Table 2. Considering oral hygiene practices (behaviors), there were significant gender differences in

brushing, Miswak usage and flossing frequency. Brushing and flossing were significantly more frequent in females compared to males while males reported using Miswak more often. However the beliefs of both males and females in the importance of tooth brushing and Miswak usage were not significantly different. Females believed more in the importance of tooth flossing compared to males ($p < 0.001$). Similarly, both males and females had the same beliefs in the role of carbohydrates in initiating dental caries and in the importance of regular dental visits for dental checkup; however, their behaviors were dissimilar. Females visited the dentist more regular compared to males with a statistically significant difference ($P < 0.001$), but males consumption of carbohydrates were significantly less than females ($P = 0.04$).

The presence of gingival bleeding, halitosis, extracted teeth, and malocclusion was not statistically different among both genders; however, from these three conditions, females were having significantly better behaviors by seeking periodontal treatment for gingival diseases.

Most patients from both genders believed in the relationship between appearance of their teeth with their overall appearance (89%), as well as the presence of a relationship between oral health with general health (93%).

Tables 3 and 4 presented the percentage of differences between oral health beliefs and behaviors within participants of the same gender. For males, (Table 3) the percentage of difference (gap) between those who believed in the importance of an issue and their behaviors towards appropriate action were; 45% in relation to missing teeth, 42% in relation to usage of Miswak, and 35% in relation to flossing regularly. The least difference between beliefs and behaviors was found in carbohydrates consumption with 23.1% difference. For females, (Table 4) the percentage of difference (gap) between oral health beliefs and behaviors were 46% and 44% for regular Miswak and floss usage, respectively followed by replacement of missing teeth (43%). The least difference between beliefs and behaviors was found in regular visits to the dentist (13%).

Table 1 Demographic description of the study population.

| Variable | Category | N (%) | Total |
|-------------------|------------------------|------------|-------|
| Gender | Male | 251 (48.4) | 519 |
| | Female | 268 (51.6) | |
| Age | 18–34 | 328 (65.8) | 499 |
| | > 34 | 171 (34.3) | |
| Educational level | Below high school | 62 (12.4) | 502 |
| | High school or diploma | 184 (36.7) | |
| | Bachelor or above | 256 (51.0) | |
| Monthly income | SR up to 5000 | 97 (21.3) | 456 |
| | SR5000-SR15000 | 219 (48.0) | |
| | SR15000-SR20000 | 82 (18.0) | |
| | > SR20000 | 58 (12.7) | |
| Occupation | White collar job | 71 (15.4) | 460 |
| | Blue collar job | 160 (34.8) | |
| | Student | 73 (15.9) | |
| | House wife | 35 (7.6) | |
| | Retired/unemployed | 121 (26.3) | |
| Smoking | Yes | 79 (15.5) | 511 |
| | No | 432 (84.5) | |
| Systemic disease | Yes | 78 (15.0) | 519 |
| | No | 441 (85.0) | |

No significant relation was found between beliefs and behaviors with different categories of each of the following: income, systemic diseases, occupation, and educational levels ($p > 0.05$, using chi square test).

4. Discussion

Understanding oral beliefs and behaviors differences between males and thought to be beneficial to the community health care providers. This understanding would help health care policy makers to better appreciate the gender differences in beliefs and behaviors, which would lead to better allocation of effort and resources to the areas needed most. Since there is no published studies found to address the differences in beliefs and consequently behaviors among Saudi male and female patients, this study come to shed light on this aspect.

National Guard Health Affairs is one of health care departments providing health related services to a tangible number of families of the National Guard employees in Riyadh, Saudi Arabia. There is no reason to believe that the sample in our study is significantly different than other Saudi population in other sectors.

The questionnaires were distributed to several medical departments in order to have a better representative sample with high number of participants. The exclusion of participants with special conditions like pregnant women or disabled subjects was done since their results cannot be generalized to general population.

In this study we used Self-reported questionnaire since it is one of the most appropriate and convenient method by the patients and the investigators. The data reported in this study was based on patients' recollection and their ability to comprehend the questions. Thus, recollection bias might need to be considered when analyzing the results. Patient interview, which can be used to increase patients' comprehension of the questions, was not feasible since the sample size exceeded the 500 participants. Moreover, most studies in this regard depend on self-reported questionnaires.

This study indicated that females have significantly higher positive practices of tooth brushing than males. Most studies conducted in the Middle East such as Kuwait and Jordan supported this fact (Al-Ansari and Honkala, 2007; Al-Hussaini et al., 2003; Al-Omari and Hamasha, 2005). However, the Oberoi et al. (2014) from India showed an opposite result. This could be explained by cultural differences such as social behaviors (Oberoi et al., 2014).

Regarding regular dental visits, females reported to have significantly more positive behavior despite transportation special situation for females. This result supports that females have higher levels of compliance compared to males (Fukai et al., 1999; Al-Hussaini et al., 2003; Baseer et al., 2012).

Even with the low prevalence of flossing regularity, females have demonstrated more positive practices, which is consistent with most of the relevant literature. However, there is a need to focus more on improving attitudes and behaviors in both genders in flossing. On the other hand, it was reported that there is no gender difference in flossing in Jordan and Kuwaiti studies (Al-Omari and Hamasha, 2005; Al-Hussaini et al., 2003).

Both males and females believed in the efficiency of Miswak usage. However, in this study male reported higher miswak usage. The results are in agreement with Farsi et al. (2004)

Table 2 Frequency distribution of oral health beliefs and behaviors' variables among deferent gender groups.

| Variable | Category | Male | | Female | | X ² | P value |
|---|-------------|------|--------|--------|--------|----------------|----------|
| | | N | % | N | % | | |
| Believe in importance of teeth brushing | Yes | 236 | (94.8) | 261 | (97.8) | 3.212 | 0.1000* |
| | No | 13 | (5.2) | 6 | (2.2) | | |
| Brushing daily | Regularly | 153 | (63.8) | 206 | (79.5) | 15.381 | < 0.001* |
| | Irregularly | 87 | (36.3) | 53 | (20.5) | | |
| Believe in efficiency of Meswak | Yes | 164 | (67.8) | 167 | (63.0) | 1.259 | 0.264 |
| | No | 78 | (32.2) | 98 | (37.0) | | |
| Usage of Meswak | Yes | 84 | (34.0) | 51 | (19.4) | 13.981 | < 0.001* |
| | No | 163 | (66.0) | 212 | (80.6) | | |
| Usage of Meswak daily | Regularly | 56 | (25.7) | 39 | (17.4) | 4.486 | 0.037* |
| | Irregularly | 162 | (74.3) | 185 | (82.6) | | |
| Believe in flossing efficiency | Yes | 118 | (48.6) | 176 | (67.2) | 17.961 | < 0.001* |
| | No | 125 | (51.4) | 86 | (32.8) | | |
| Flossing daily | Regularly | 25 | (13.7) | 54 | (23.4) | 6.242 | 0.016* |
| | Irregularly | 158 | (86.3) | 177 | (76.6) | | |
| Believe carbohydrates could cause caries | Yes | 229 | (92.0) | 247 | (92.2) | 0.007 | 1.000 |
| | No | 20 | (8.0) | 21 | (7.8) | | |
| Restrict the use of carbohydrates for your health | Yes | 161 | (64.1) | 148 | (55.2) | 4.280 | 0.040* |
| | No | 90 | (35.9) | 120 | (44.8) | | |
| Believe in importance of regular dental checkup | Yes | 220 | (89.8) | 249 | (94.3) | 3.589 | 0.070 |
| | No | 25 | (10.2) | 15 | (5.7) | | |
| Visit the dental clinic | Regularly | 154 | (65.5) | 199 | (81.6) | 15.859 | < 0.001* |
| | Irregularly | 81 | (34.5) | 45 | (18.4) | | |
| Gingival bleeding specially after brushing | Yes | 124 | (49.8) | 115 | (43.4) | 2.116 | 0.157 |
| | No | 125 | (50.2) | 150 | (56.6) | | |
| Believe that gum bleeding is normal | Yes | 97 | (39.3) | 62 | (23.6) | 14.627 | < 0.001* |
| | No | 150 | (60.7) | 201 | (76.4) | | |
| Seek periodontal treatment for gingival bleeding | Yes | 78 | (33.3) | 41 | (16.6) | 18.072 | < 0.001* |
| | No | 156 | (66.7) | 206 | (83.4) | | |
| Suffering from halitosis | Yes | 43 | (17.3) | 40 | (15.4) | 0.332 | 0.631 |
| | No | 205 | (82.7) | 219 | (84.6) | | |
| Seek dental treatment for halitosis | Yes | 6 | (4.4) | 4 | (2.9) | 0.041 | 1.000 |
| | No | 72 | (52.6) | 55 | (40.1) | | |
| Extracted a tooth previously | Yes | 144 | (58.3) | 157 | (59.9) | 0.139 | 0.719 |
| | No | 103 | (41.7) | 105 | (40.1) | | |
| Seek dental replacement for missing teeth | Yes | 162 | (33.9) | 315 | (35.9) | 0.527 | 0.474 |
| | No | 75 | (13.5) | 136 | (16.6) | | |
| Having malocclusion | Yes | 118 | (47.6) | 116 | (45.0) | 0.349 | 0.593 |
| | No | 130 | (52.4) | 142 | (55.0) | | |
| Seek dental treatment for malocclusion | Yes | 67 | (35.4) | 158 | (26.1) | 3.029 | 0.095 |
| | No | 53 | (17.9) | 99 | (20.6) | | |
| Believe that your teeth affect your appearance | Yes | 220 | (89.1) | 230 | (88.5) | 0.047 | 0.889 |
| | No | 27 | (10.9) | 30 | (11.5) | | |
| Believe that oral health affect general health | Yes | 226 | (91.5) | 248 | (95.0) | 2.520 | 0.154 |
| | No | 21 | (8.5) | 13 | (5.0) | | |

* Significantly different using chi-square test (P value < 0.05).

study in Saudi Arabia. Moreover, there was a positive association between Miswak usage and age. Using Miswak by older males is more socially and religiously acceptable especially around prayer times.

Females reported higher daily consumption of refined carbohydrates compared to males. This finding is in agreement with two studies from Japan and Portugal (Fukai et al., 1999; Bica et al., 2014). One of the possible explanations for frequent use of sugars by females is the fact that eating might reduce stress and depression as indicated in two American studies (Nishizawa et al., 1997; Wurtman and Wurtman, 1995).

Gingival bleeding was found to be less significant among males compared to females, even though females had better

behavior towards treating gingival inflammation. The results of this study were consistent with those of one Turkish study (Peker and Alkurt, 2009) but not supported by other two studies (Fukai et al., 1999; Al-Omari and Hamasha, 2005).

The finding of this study demonstrated that both males and females have almost the same knowledge level about oral health. Surprisingly they do not have the same behavior towards it. Reviewing the literature, females were found to be more concerned about their appearance and beauty than males did. Females tend to better take care of their teeth as well. Furthermore, females are more likely to follow instructions and to adhere to their booked appointments compared to males. New studies to explore the real reasons behind having this gender difference should be conducted. The results

Table 3 The mean difference in the percentages with those with believes and those with behaviors toward oral health among males.

| Variable | Category | N (%) | Percentage difference |
|--|-----------|-----------|-----------------------|
| Extracted a tooth previously | Yes | 144(58.3) | 44.8 |
| Seek dental replacement for missing teeth | Yes | 75(13.5) | |
| Believe in efficiency of Meswak | Yes | 164(67.8) | 42.0 |
| Daily usage of Meswak | Regularly | 56(25.7) | |
| Suffering from halitosis | Yes | 43(17.3) | 35.3 |
| Seek dental treatment for halitosis | Yes | 72(52.6) | |
| Believe in flossing efficiency | Yes | 118(48.6) | 34.9 |
| Flossing daily | Regularly | 25(13.7) | |
| Believe in importance of brushing | Yes | 236(94.8) | 31.0 |
| Brushing daily | Regularly | 153(63.8) | |
| Having malocclusion | Yes | 118(47.6) | 29.7 |
| Seek dental treatment for malocclusion | Yes | 53(17.9) | |
| Gingival bleeding specially after brushing | Yes | 97(39.3) | 27.4 |
| Seek periodontal treatment for gingival bleeding | Yes | 156(66.7) | |
| Believe in importance of regular checkup | Yes | 220(89.8) | 24.3 |
| Visit the dental clinic | Regularly | 154(65.5) | |
| Believe carbohydrates cause caries | Yes | 229(92.0) | 23.1 |
| Daily Usage of carbohydrates | No | 173(68.9) | |

Table 4 The mean difference in the percentages with those with believes and those with behaviors toward oral health among females.

| Variable | Category | N (%) | Percentage difference |
|--|-----------|-----------|-----------------------|
| Believe in efficiency of Meswak | Yes | 176(63.0) | 45.6 |
| Daily usage of Meswak | Regularly | 39(17.4) | |
| Believe in flossing efficiency | Yes | 176(67.2) | 43.7 |
| Flossing daily | Regularly | 54(23.5) | |
| Extracted a tooth previously | Yes | 157(59.9) | 43.3 |
| Seek dental replacement for missing teeth | Yes | 136(16.6) | |
| Gingival bleeding specially after brushing | Yes | 115(43.4) | 40.0 |
| Seek periodontal treatment for gingival bleeding | Yes | 206(83.4) | |
| Suffering from halitosis | Yes | 40(15.4) | 24.7 |
| Seek dental treatment for halitosis | Yes | 55(40.1) | |
| Having malocclusion | Yes | 116(45.0) | 24.4 |
| Seek dental treatment for malocclusion | Yes | 99(20.6) | |
| Believe in importance of brushing | Yes | 261(97.8) | 18.3 |
| Brushing daily | Regularly | 206(79.5) | |
| Believe carbohydrates cause caries | Yes | 247(92.2) | 15.4 |
| Daily Usage of carbohydrates | No | 205(76.8) | |
| Believe in importance of regular checkup | Yes | 249(94.3) | 12.7 |
| Visit the dental clinic | Regularly | 199(81.6) | |

indicate the necessity of addressing the fundamental difference in attitude and behavior by stimulating positive behaviors toward oral health among males. Additionally, health care providers might need to focus more on male oral health care by encouraging good behavior during their dental visits.

The findings of this study indicate that most of participants have enough knowledge about oral health. More than 90% of males and females knew the importance of tooth brushing, restricted use of carbohydrates, the dental visits, etc. This indicates that Saudi subjects do not need more education about their oral health but they need to be encouraged to act.

5. Conclusion

Female patients have, in general, more positive oral health behaviors in brushing, flossing and regular dental visits than

male patients. It also indicated that female participants in general, act more positively toward oral health than males. The study presents valuable information about the differences between beliefs and behaviors of Saudi population. Health care providers should focus more on the improvement of oral health behaviors and practices specifically among males. Furthermore, oral health campaigns should switch their focus from people's education to oral health practices and actions.

Areas for further study

Further research is recommended to investigate the reasons for lack of oral health good practice to minimize the gap between behavior and belief among patients.

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Conflict of interests

The authors declare that they have no conflict of interest and there was no external source of funding for the present study.

Ethical approval

This project was approved by the institutional Review Board of King Saud University for Health Sciences and permission to conduct the study was obtained from the administration of King Fahad Hospital of National Guard Health Affairs. All participants signed the provide consents that was attached to the questionnaire.

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