Factors Associated with Failed Dental Appointments:
A Retrospective Cross Sectional Study

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Abstract

Introduction: Failing to attend dental appointments is a common issue faced by the patients and dental students, which leads to time loss. The aim of this study was to investigate the factors associated with failed dental appointments at Kuwait University Dental Clinic (KUDC). Material and methods: A questionnaire was prepared which was used to look into the patients’ demographic data, socioeconomic status, patients’ medical status (ASA classification), method of transportation utilized to arrive at KUDC, and date of last dental visit prior to admission at KUDC. This study also reviewed the complexity of the treatment plan, and the procedures planned to be carried out at the time of the failed appointment. The data was collected by contacting the patients over the phone and reviewing their records at KUDC. Results: Results showed that 59% were males while 41% were females, and most were in the age group of 26-35 years. Failed dental appointments are significantly (p<0.05) influenced by the complexity of the treatment plan. Conclusion: Male patients and those of age 26-35 years seem to have shown a higher incidence of failed dental appointments. In addition, failed dental appointments seem to be significantly influenced by the complexity of the treatment plan.
Introduction

Failing to attend dental appointments is a common issue faced by the patients and dental students, which leads to time loss. Accumulation of time loss because of broken appointments in university dental clinics can lead to students encountering problems that would impact the learning experience in a negative way. Numerous studies have looked at this matter, employing several methods, such as an in-depth study of dental records in conjunction to patient’s interviews. Albarakati et al conducted a study in Saudi Arabia, in King Saud University, that only included female subjects 14 years of age and older. Albarakati et al concluded that most of the patients who broke their appointments were married, housewives, above 40 years in age, of low to middle socioeconomic status.\(^1\)

Another study conducted, looked at the reasons for irregular dental care in the patients attending the clinic in a teaching hospital found out that education and age of the patient play an important role in patient’s compliance.\(^2\) Factors which have also been studied, were plaque score, treatment planned, distance between the patient’s home and the clinic which were related to attendance history.\(^3\)

While some studies looked into the factors and reasons associated with failed dental appointments, others have investigated the effect of appointment reminders on attendance rates. Appointment reminders employed in some of the studies were phone calls, text messages, and mailed reminder letters. A randomized controlled study carried out by Fairhurst et al found that the non-attendance rate was 12% in the intervention group that received a text message reminder. On the other hand, the non-attendance rate in the control group that received no reminder was 17%. Based on these findings they failed to demonstrate significant reduction in non-attendance rate as a result of texting.
appointment reminders. Another randomized controlled trial on the use of postal reminders to reduce non-attendance at an orthodontic clinic found that the use of postal reminders for orthodontic consultation appointments appears to result in a useful increase of appointments that are kept or cancelled in advance. Some researches studied the effectiveness of text messages in reducing the occurrence of failed appointments. In one study the use of SMS text reminders resulted in a statistically significant reduction in the number of failed attendances at appointments. Another study showed that text-message reminders were not effective in reducing the proportion of missed appointments.

At this time, no studies have been conducted in Kuwait University Dental Center (KUDC) to investigate issues associated with failed dental appointments even though it is an existing issue that has a negative impact on both the dental student and the patient. Failed dental appointments result in time loss, a reduction in the productivity of dental treatment, and difficulty for the students to fulfill their academic requirements. The aim of this study is to investigate factors associated with broken appointments at KUDC. This will provide dental students with information that may help minimize the occurrence of failed dental appointments. Further investigation into this matter will help identify key issues that can be addressed to reduce the occurrence of this problem.

**Material and Methods**

Study inclusion criteria was patients aged 12 and above, given that they were not receiving dental treatment under pediatric care. The rationale behind excluding patients seen in the comprehensive pediatric care (CPC) is that the treatment provided differs from that provided in the comprehensive dental care (CDC), which involves treatment of
adolescents and adults. The second condition was that patients should have failed to attend at least 3 dental appointments, and the reason behind this is that in most cases after 3 failed appointments the patient’s file is closed. Based on the mentioned inclusion criteria, out of the approximately 3550 files reviewed only 144 met the inclusion criteria. However, only 100 were reached over the phone, and one refused to participate.

A questionnaire was prepared which was used to look into the patients’ demographic data, which included age, gender, nationality, marital status, number of children, and residence area by governorate. Socioeconomic status was also included in the questionnaire looking into the patient’s level of education, income, and occupation. Those who were employed were grouped according to the classifications of the International Standard Classification of Occupations (ISCO-08). Other factors that were investigated were patients’ medical status (ASA classification), method of transportation utilized to arrive at KUDC, and date of last dental visit prior to admission in KUDC. This study also reviewed the complexity of the treatment plan, which was measured by the number of dental disciplines treatment planned. Dental treatment provider, and the procedures planned to be carried out at the time of the failed appointment were also taken into account. The data was collected by a direct interview over the telephone and by reviewing the subject’s records at KUDC. Data analysis was performed using the Statistical Package for Social Sciences version 21.0 (SPSS Inc, Chicago, IL, USA). Frequency and percentages of the factors of failed dental appointments were analyzed.
Results

Out of the 100 participants, 59% were males while 41% were females at an approximate ratio of 3:2. The mean age of the subjects was 37 with a range of 13-70 years. Most failed dental appointments occurred in the age group of 26-35 years (29%). While the second and third highest occurrences of failed appointments were in the age groups 46-55 years and 36-45 years respectively. Subjects studied were of 20 different nationalities. Twenty three percent were Egyptian, 22% were Kuwaiti, and 11% were Philipino.

With regards to marital status, 63% of the subjects were married while 31% were single. Since a major proportion of the subjects were married, the number of children was taken into consideration. Most of the participants (36%) had 1-3 children, whereas 21% had 4-7 children and 3% had 8+ children. Meanwhile 40% had no children, of which 31% were single. Table 1 summarizes the demographic data of the study participants.

Subjects were grouped into 3 main categories for occupation: Students (18%), employed (62%) and unemployed or retired (20%). Those employed were subcategorized using the ISCO-08 classification. Out of the 62 employed subjects, about a third were classified as category 5 (service and sales workers), as shown on figure 1. Approximately half of the subjects had an education of high school and below (51%), while the other half had an education of above high school (49%). Only 1 respondent was illiterate. Sixty five percent had a monthly income of ≤500 Kuwaiti Dinars (KD), and 26% had a monthly income of >500 ≤1000KD, while 8% had an income of >1000KD.

Considerations were made to study the type of transportation utilized to arrive at KUDC. Cars were the most method of transportation employed by the subjects, as 50% had their
own cars and 21% of the participants depended on others to drive them to the location by car. On the other hand, 17% of the individuals enrolled in the study used a taxi. Along with transportation, residence area was studied. Kuwait is divided into 6 governorates. 48% and 21% of individuals were from Hawally and AlFarwaniya governorates, respectively (fig. 2).

Another factor that was examined was the date of the last dental visit prior to admission to KUDC. Fifteen percent visited the dentist ≤6 months prior to admission, 49% visited the dentist >6months ≤2years and 34% haven’t visited the dentist in >2years.

Seventy five percent of the patients were classified as ASA1, 19% as ASA2, and 6% ASA3.

Complexity of treatment plan was measured by the number of disciplines involved. The disciplines included were: periodontics, operative dentistry, endodontics, prosthodontics, surgery, and orthodontics. It was found that 49% of the participants had 3-4 disciplines involved in their treatment plan, where 33% had only 5-6 disciplines, and 18% had only 1-2 disciplines. Failed dental appointments are significantly (p<0.05) influenced by the complexity of the treatment plan.

Of those who failed to attend, 98 patients were treated by undergraduate dental students. 1 was treated by a scholarship holder, and 1 by both an undergraduate dental student and a scholarship holder.

The collective number of failed dental appointments was 371. In 19 of the failed dental appointments two procedures were planned. Therefore the total number of procedures
planned at the appointments is 390. Fig. 3 illustrates the percentages of the procedures that were planned at the failed dental appointments. Most failed appointments occurred when the procedure planned for the session was operative treatment, scaling +/- root planing, or periodontal re-evaluation, with percentages of 23.9%, 16.9%, and 16.2%, respectively.

**Discussion**

Most failed dental appointments occurred with males (59%) as opposed to females (41%). Male patients (14.9%) seem to have a higher proportion of broken appointments than female patients (12.4%). Bernson et al and Javier et al concluded that the male gender is associated with irregular attendance. 8, 9, 10

Twenty nine percent of the subjects included in the study were in the age group of 26-35 years, however, KUDC records have shown that 22.5% of the approximately 3550 patient records reviewed in this study are in the previously mentioned age-group. Failed dental appointments were in excess of four times higher in patients aged 19-25 years and 26-35 years compared to patients 65 years and older. 11 Different results were found in a study on non-attendance in a dermatology clinic in which the age distribution displayed two peaks, one in the second and the other in the sixth decade. 12

Subjects studied were of 20 different nationalities. Twenty three percent were Egyptian, 22% were Kuwaiti, and 11% were Philipino. When reviewing the nationalities of the total patients at KUDC, it was noticed that the majority were Kuwaiti (38.6%), Egyptian (14.8%), and Philipino (10.9%). This could present a confounding factor that may need to be further analyzed. Poor appointment-keeping rates differed >2-fold across ethnicities: Latinos (12%), African Americans (10%), Philipinos (7%), Caucasians (6%), and Asians
The missed appointment rate was substantially higher among African-American patients 15.9%. A study of "broken appointment" patients in a children's hospital dental clinic concluded that Medicaid patients were statistically more likely to be "High Risk No Show" patients. Race was associated, but was found to be confounded with Medicaid. Therefore, ethnicity appears to be associated with failed dental appointments.

As mentioned, 63% of the subjects were married. Two thirds of the participants had children. Most of which had around 1-3 children (36%). On the contrary, a demographic study showed that single or separated females were more likely to be non-attenders at a gynecology outpatient clinic.

Two-thirds (62%) of the subjects were employed, of which 35% were in the sales and services sector according to the ISCO-08 classification. As for education, approximately half of the subjects have an education of high school and below (51%), while the other half have an education of above high school (49%). A positive and significant correlation between literacy and patient reporting status was found. Sixty five percent had a monthly income of ≤500 Kuwaiti Dinars (KD) and 26% had a monthly income of >500 ≤1000KD. It is worth mentioning that nearly all of the services provided at KUDC are free of charge, as compared to other clinics whose fees are covered by insurance. It has been demonstrated that characteristics associated with missed appointments were Medicaid coverage, which provide free of charge care for US patients, or lack of health insurance. On the other hand; socio-economic status was not useful in helping a clinician to choose potentially co-operative orthodontic patients.

The majority of the subjects used a car to arrive at KUDC. Most drive their own cars,
while others depend on family members or taxis to transport them. Forty-eight and twenty one percent of individuals were from Hawally and AlFarwaniya governorates, respectively. KUDC is located in Hawally governorate which may explain why about half of the study participants live in this area. In fact 22% and 26% of Kuwait’s inhabitants live in Hawally and Al-Farwaniya governorates according to a census carried out in Kuwait in 2011. It is worth mentioning, that those living in Al-Farwaniya are at a further distance than those living in Hawally governorate. The distance from the homes of Hawally residents to KUDC is short.

Seventy five percent of the respondents were classified as ASA1, 19% as ASA2 and 6% ASA3 this could be explained by the fact that only patients with ASA3 and below are admitted at KUDC. Medical status has shown relevance to appointment keeping behavior in which adherence to appointments, independent of visit frequency, was a strong predictor of diabetes metabolic control.\textsuperscript{14}

The incidence of failed dental appointments is positively correlated with the number of disciplines in the treatment plan (1-4 disciplines), but shows a drop when 5-6 disciplines are included in the treatment plan. Failed dental appointments are significantly (p<0.05) influenced by the complexity of the treatment plan. It is worth mentioning that patients only requiring one discipline are usually not admitted at KUDC. Moreover the majority of the patients treated at KUDC require treatment from 3-4 disciplines.

Most patients at KUDC are treated by dental students, and some by scholarship holders and faculty members. Ninety eight percent of the subjects were treated by dental students, 1% by a scholarship holder, and 1% by both a dental student and scholarship holder. One
of the characteristics associated with missed appointments were those scheduled with first-year residents or medical students.\textsuperscript{17}

As mentioned previously, the majority of broken appointments occurred when the procedure planned for the session was operative treatment, scaling +/- root planing, or periodontal re-evaluation (fig. 3). Meanwhile, the majority of patients undergoing treatment at KUDC require treatment planning, scaling +/- root planing, and operative. Researchers have looked into broken appointment behavior in a dental school environment and found that 34\% of broken appointments were in the restorative clinic at a campus serving primarily male patients and 24\% in the removable partial denture clinic at a campus serving only female patients.\textsuperscript{8} Another study on periodontal maintenance revealed that only 30\% returned for the three-month prophylaxis recall visit after the initial periodontal surgical appointment.\textsuperscript{19}

Although most of the factors associated with failed dental appointments were included in this study, patient’s reasons for cancellation were not investigated. Lack of time and transportation difficulty were found to be reasons for non-attendance.\textsuperscript{1,2} Other factors that should have been considered are patient’s satisfaction with dental treatment provided, whether the patient has been transferred between dental students, and the perceived competence level of the dental student. In this paper urgency of treatment needed was overlooked. Urgency or non-urgency of the procedure was statistically significantly associated with truancy.\textsuperscript{20} Nevertheless, not all failed appointments are patient related, some were facility, work-up, or surgeon related.\textsuperscript{21}

Other similar studies investigated other factors. Csikar et al looked at smoking status and
its association with attendance rate.\textsuperscript{22} Another research looked at the appointment keeping behavior of Medicaid and non-Medicaid orthodontic patients and their appointment-keeping behavior was evaluated.\textsuperscript{23} Hayes and Burke analyzed the attitudes of dental patients attending general dental practice in Galway and compared dental attendance percentage between dentate and edentate patients with the use of questionnaires.\textsuperscript{24}

The occurrence of failed appointments could be reduced by several means of intervention. Some studies have demonstrated that reminder strategies have shown promising results. Prompting letters resulted in an average non-attendance rate of 17\% which was significantly less compared to 27\% when no reminders were used.\textsuperscript{25} A clinic staff reminder was significantly more effective in lowering the no-show rate compared with an automated appointment reminder system.\textsuperscript{26} Text-message reminders and telephone reminders in reducing the proportion of missed appointments.\textsuperscript{27,28} Effectiveness of mailed appointment reminders on reducing broken appointments may decrease with time.\textsuperscript{29} Patient-initiated appointment confirmation was considered more consistent than the traditional phone reminders with the concept of patient responsibility for his own health care.\textsuperscript{30}

\textbf{Conclusion}

Failing to attend dental appointments is a common issue faced by the patients and dental students. According to analysis of this study demographics and socioeconomic status were associated with failed dental appointments. Male patients and those of age 26-35 years seem to have shown a higher incidence of failed dental appointments. It has been shown that those of low socioeconomic status were more likely to fail to attend their
appointment. Irregular dental attendance has demonstrated to be an indicator for lack of compliance to scheduled dental appointments. Complexity of treatment plan was found to be associated with failed dental appointments. Efforts in reminding patients about their appointments could result in a decrease in failed appointments. Findings in this study may not be applicable to all communities. Further investigation needs to be carried out to show significance of these factors on other communities.
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<td>9%</td>
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<td>9%</td>
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</tr>
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<td>22%</td>
</tr>
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<td>11%</td>
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<td>19%</td>
<td>31%</td>
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<td>2%</td>
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<tr>
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<td>25%</td>
<td>63%</td>
</tr>
<tr>
<td>Widowed</td>
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<td>4%</td>
<td>4%</td>
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</table>

Table 1. Demographic data of subjects
Figure 1. Distribution of study participant’s occupations

Figure 2. Respondents distribution based on residence area
Figure 3. Procedures planned at failed dental appointments
References:


APPENDIX A

Consent Form

Title: Factors Associated with Failed Dental Appointments

The aim of this research is to investigate factors associated with broken appointments at Kuwait University Dental Center. This will provide dental students with information to help minimize the occurrence of failed dental appointments.

The method employed in this study is a direct interview in correlation with an in-depth study of patient file records.

The study will involve past or current patients at Kuwait University Dental Center.

The patient will be requested to provide a verbal consent over the phone.

No potential risks to the subjects are anticipated due to this study.

Patient confidentiality will be protected throughout the study. No personal information will be used except for the purpose of statistical analysis of the data and without reference to individual subjects. No identification of study subjects will be made in any publication resulting from this study.

There is no obligation or compulsion for the patient to participate in this study.

The patient has the right to withdraw from the study at any stage.

Please indicate below if the patient wishes to participate in this study (to be filled by the interviewer)

☐ Agree
☐ Disagree

Thank you for your participation

Aaeshah AlKanderi

Hessa AlBader
APPENDIX B

Patient Records and Direct Interview - Form

1. Serial no.    __________

2. Gender
   O Male
   O Female

3. Age    __________

4. Nationality    __________

5. Marital status
   O Single
   O Married

6. Number of children    __________

7. Occupation
   O Unemployed
   O Student
   O Employed ______________________________________________________________________

8. Level of education
   O No education
   O High school and below
   O Above high school
9. Income ________________

10. Type of transportation utilized to arrive at KUDC
    - Walking
    - Bike or motorcycle
    - Taxi
    - Public transportation
    - Car
      i. Do you drive?
         1. Yes
         2. No

11. Residence area
    - Capital
    - Hawally
    - Al-Farwaniya
    - Al-Ahmadi
    - Mubarak Al-Kabeer
    - Al-Jahra

12. Date of last dental visit prior to admission to KUDC
    ______________________________________________

13. Medical condition
    - ASA 1
    - ASA 2
    - ASA 3
    - ASA 4
    - ASA 5
14. Complexity of treatment planned measured by number of disciplines involved

<table>
<thead>
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<td>Operative Dentistry</td>
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</tr>
<tr>
<td>Endodontics</td>
<td></td>
</tr>
<tr>
<td>Prosthodontics</td>
<td></td>
</tr>
<tr>
<td>Non-surgical extractions</td>
<td></td>
</tr>
<tr>
<td>Surgery (including periodontal surgery)</td>
<td></td>
</tr>
<tr>
<td>Orthodontics</td>
<td></td>
</tr>
</tbody>
</table>

15. Treatment provided at KUDC by:
   - O Undergraduate dental students
   - O Scholarship holders and faculty members

16. Procedure to be done during failed dental appointment

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
Factors Associated with failed dental appointment

We will be using the data collected from the patients to determine the factors associated with dental appointments. Informed Consent

Please note that this study involves the provision of dental care. The patients will be informed about the risks and benefits associated with dental care. Their consent will be sought before any dental treatment is performed.

This study has been approved by the ethical review board. Any questions or concerns should be directed to the principal investigator.