RESEARCH ARTICLE

Investigating the reasons for missing an outpatient appointment in Royal Hospital, Sultanate of Oman: Perspectives of patients and medical staff in a survey

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Abstract

Introduction: Missed appointments are a major health issue in the healthcare systems globally. They directly impact on the use of hospital resources, patient's health, and can lead to patient's dissatisfaction. This study was conducted to assess the reasons for missing a hospital appointment.

Methods: A survey was conducted with a randomly selected sample of patients who missed their outpatient appointment in Royal hospital, Sultanate of Oman, from March to April 2021 in six clinics. Patients were interviewed via telephone to answer a structured survey. In addition, a self-administered survey was distributed to medical staff to explore their perspectives.

Results: Two hundred eighty patients and 52 medical staff participated in the study. Frequent patient-reported reasons for missed appointment were transportation difficulties (11.4%), no longer needing (7.5%), or forgetting the appointment (6.8%); staff-reported reasons were transportation (23.8%), no SMS received (16.9%), and forgetting the appointment (15.4%). Frequencies of reasons varied substantially between clinics. Family obligations were the main theme in obstetrics (odds ratio [OR] 9.48; 95% confidence interval [CI] 2.66-33.78) and in diabetes clinic (OR 10.55; 95% CI 2.68-38.58), where transportation issue was the main theme in Oncology clinic (OR 4.83; 95% CI 1.11-21.02). The recommendations for improvement were mainly around improving the reminder system, the use of telephone reminders, and developing a flexible appointment scheduling system.

Conclusion: Knowing the reasons for missed appointment from patients and health professionals can help to develop effective interventions. The heterogeneity between clinics in reasons for missed appointment indicates for interventions tailored to clinic and frequent reasons.

KEYWORDS
multinomial logistic regression, patients and medical staff perspective, reasons for missed hospital appointment, self-administrated survey, telephone survey questionnaire

1 | BACKGROUND

A missed hospital appointment is a common problem in healthcare systems globally. The rate of missed hospital appointment varies between countries, different practices, and type of healthcare setting, with rates varying from 5% to 30% and reported to be as high as 60% in some mental health clinics.[1-4] Published studies identified age, waiting time, marital status, a history of previous missed appointment, economic status, and distance from the hospital as factors associated with missing an appointment.[5,6] Studies have also shown that missed appointments could lead to increased waiting time, loss of revenue, increased emergency visit, and hospital admissions.[7-9] Reasons for missed hospital appointment cited in the literature include transportation issues, working commitments, being too poorly on the day of the appointment and forgetting about the appointment.[10-13] Interventions such as the use of short messages service (SMS) text reminder, improvements to the booking service, use of telehealth and telephone reminders have been implemented to reduce the rate of missed appointments.[14-16]

To date, the majority of these studies have been conducted in Europe and the United Studies. There is a lack of knowledge about the reasons for missed hospital appointment in Eastern countries, such as Oman. The reasons for missed hospital appointments in Oman
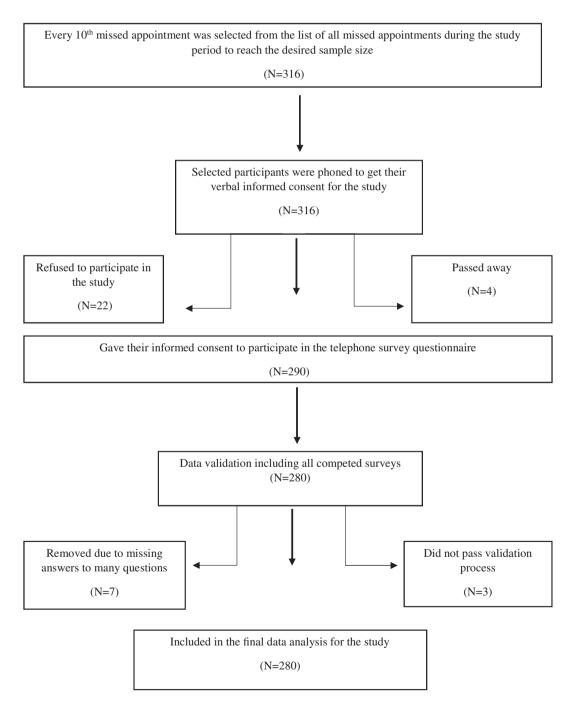


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┌─────────────────────────────────────────────────────────────────────┐
│ Every 10th missed appointment was selected from the list of all      │
│ missed appointments during the study period to reach the desired     │
│ sample size                                                          │
│                            (N=316)                                   │
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                                   │
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                      ┌────────────────────────────┐
                      │ Selected participants were  │
                      │ phoned to get their verbal  │
                      │ informed consent for the    │
                      │ study                       │
                      │         (N=316)             │
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┌──────────────────┐                      ┌──────────────────┐
│ Refused to       │                      │ Passed away      │
│ participate in   │                      │     (N=4)        │
│ the study        │                      │                  │
│     (N=22)       │                      └──────────────────┘
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┌─────────────────────────────────────────────────────────────────────┐
│ Gave their informed consent to participate in the telephone survey   │
│ questionnaire                                                        │
│                            (N=290)                                   │
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                                   ▼
                      ┌────────────────────────────┐
                      │ Data validation including   │
                      │ all competed surveys        │
                      │         (N=280)             │
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          ▼                    ▼                     ▼
┌──────────────────┐                      ┌──────────────────┐
│ Removed due to   │                      │ Did not pass     │
│ missing answers  │                      │ validation       │
│ to many          │                      │ process          │
│ questions        │                      │     (N=3)        │
│     (N=7)        │                      └──────────────────┘
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                      ┌────────────────────────────┐
                      │ Included in the final data  │
                      │ analysis for the study      │
                      │         (N=280)             │
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FIGURE 1 Flowchart of participant recruitment and data cleaning process

might be different from those identified by previous studies because of the different culture, healthcare setting, and how the healthcare is managed and financed. The main aim of this research was to identify the reasons for missed hospital appointment from both patient and medical staff perspectives in multiple outpatient clinics at the Royal Hospital, Sultanate of Oman. This study follows a previous study about the prevalence and factors associated with missed hospital appointments based on electronic healthcare records.[17]

2 | METHODS

2.1 | Setting

The Royal hospital is the largest tertiary hospital, located in the capital city Muscat of the Sultanate of Oman with around 50 specialties and subspecialty clinics. It serves patients from all different governorates (regions) of Oman with different health needs, and it hosts the National Cardiology Centre, the National Diabetic Centre, and the National Oncology Centre. The hospital receives around 500 referred patients daily and provides outpatient and inpatient services with a 630 hospital bed capacity.[18] Previous work by the research team found out that the overall rate of missed appointment at the Royal Hospital was 22.3%, ranging from 14% to 30.3% between different clinics.[17]

2.2 | Study procedure

The hospital health information management system (ALSHIFA)[19] was used to identify patients (aged 18 years or more) who missed their outpatient hospital appointments between March 1, 2021 and April 30, 2021. An appointment that is missed without prior notification for cancellation or rescheduling was recorded into the system as a missed appointment. During the study period, a list of all patients who missed their appointment within any of the six clinics with the highest number of scheduled appointment and a high rate of missed appointment as found in previous study by the research team was created daily (Diabetics and Endocrine, Obstetrics and Gynecology, Oncology, Surgery, Urology, and Gastroenterology). Selection of each tenth patient in the list was performed for recruitment. Eligible participants were contacted by a member of the staff in the medical records department in the Royal Hospital by telephone within a maximum period of 1 week of their missed appointment in order to reduce recall bias.[20] All interviewing staff had a diploma certificate in health information management, graduated from Oman College of Allied Health and had experience contacting patients regarding hospital appointment queries. They were given a short training exercise by the first author on how to conduct a telephone survey. Participants who agreed to take part in the study were asked to give their verbal informed consent before proceeding to take part in a telephone questionnaire. The research team members and collaborators at the Oman Health information management institute reviewed the questionnaire to ensure that the questions were clear and easy to understand.

TABLE 1　Baseline characteristics of the 280 patient participants

Variables	N (%)
Sex	
Male	135 (48.2)
Female	145 (51.8)
Nationality	
Omani	273 (97.5)
Non-Omani	7 (2.5)
Age group	
19-30 Years old	62 (22.1)
31-40 Years old	67 (23.9)
41-50 Years old	65 (23.2)
51-60 Years old	28 (10.0)
61-70 Years old	32 (11.4)
71-80 Years old	21 (7.5)
>80 Years old	5 (1.8)
Waiting day group	
≤30 Days	51 (18.2)
31-60 Days	18 (6.4)
61-90 Days	65 (23.2)
91-120 Days	31 (11.1)
121-180 Days	21 (7.5)
181-365 Days	65 (23.2)
More than a year	29 (10.4)
Marital status	
Single	44 (15.7)
Married	220 (78.6)
Divorced	2 (0.7)
Widow	5 (1.8)
Missing	9 (3.2)
Governorate[a]	
Muscat (1-90 km)	154 (55.0)
South Batina (50-165 km)	32 (11.4)
AL Dhakiliya (70-206 km)	15 (5.4)
North Batina (114-262 km)	17 (6.1)
North Sharqiya (173-290 km)	18 (6.4)
South Sharqiya (205-320 km)	18 (6.4)
AL Dhahira (245-340 km)	10 (3.6)
AL Buriami (285-350 km)	2 (0.7)
AL Wusta (365-490 km)	3 (1.1)
Musandam (540-620 km)	6 (2.1)
Dhofar (800-1120 km)	5 (1.8)
Medical clinics	
Diabetics and Endocrine	43 (15.4)
Obstetrics and Gynecology	39 (13.9)
Oncology	54 (19.3)
Surgery	43 (15.4)
Urology	55 (19.6)
Gastroenterology	46 (16.4)

[a]Distance to Royal hospital (km). The distance indicates the min-max distance that patients have to travel to reach the hospital.

Question	Male N (%)	Female N (%)	Total N (%)
1. Do you have a car?			
Yes	90 (66.7)	45 (31.0)	135 (48.2)
No	45 (33.3)	100 (69.0)	145 (51.8)
2. When you do attend your appointments, whom do you usually come with?			
By yourself	82 (60.7)	26 (17.9)	108 (38.5)
With a family member	52 (38.5)	43 (29.7)	95 (33.9)
With your husband[a]	0 (0.0)	73 (50.3)	73 (26.1)
With a friend	0 (0.0)	1 (0.7)	1 (0.4)
By a taxi	1 (0.7)	2 (1.4)	3 (1.1)
3. Did you receive SMS reminder message to your mobile phone about your appointment?			
Yes	101 (74.8)	110 (75.9)	211 (75.4)
No	34 (25.2)	35 (24.1)	69 (24.6)
4. Did you try to call the hospital to cancel your appointment?			
Yes	27 (20.0)	36 (24.8)	63 (22.5)
No	108 (80.0)	109 (75.2)	217 (77.5)
5. Did you rebook for new appointment?			
Yes	39 (28.9)	40 (27.6)	79 (28.2)
No	96 (71.1)	105 (72.4)	201 (71.8)
6. Do you know about the WhatsApp service for appointment rebooking and cancelation?			
Yes	75 (55.6)	72 (49.7)	147 (52.5)
No	60 (44.4)	73 (50.3)	133 (47.5)

TABLE 2 Participants response to Sections 2 and 3 of the telephone survey questionnaires stratified by gender

[a]Only female patients.

A list of statements about the reasons for missed hospital appointments was identified from the literature.[21,22] In the first section, patients were asked to identify their main reason for missing their hospital appointment with responses documented as free text and the appropriate reason then selected from the predefined list was by the research team. Section 2 of the survey included questions about whether participants received an SMS reminder or not, whether they tried to cancel or reschedule their appointment or not, whether they own a car or not, and whether they usually drive by themselves to an appointment or they would come with someone else. Finally, participants were asked to suggest improvements that might increase attendance to hospital appointments. Patient demographic information such as year of birth, marital status, governorate (region of residence), appointment date, and medical clinic were obtained from the patient's electronic medical record. All responses were recorded in a case report for each participant. Eligible participants who did not answer the call were called again at the end of the day. Participants who did not answer a second time were dropped and a new participant was called to meet the desired sample size for the study. See Figures S1 and S2 for a copy of the questionnaire and case report form.

Two weeks after the start of the telephone survey, the research team noticed low response to question number five, which asked the participants for suggestions to improve the appointment system and reduce missed appointments. As a result, it was decided to include healthcare professionals in the study. Amendment was sent to the Centre of Research and Study in the Ministry of Health, Sultanate of Oman, to get the approval to extend the study participants. The approval was received and medical staff (doctors and nurses) were included. For the medical staff, a short self-administrated questionnaire with two open-ended questions was distributed to six clinics as mentioned previously, with the highest number of scheduled appointment and high rate of missed appointment. The first question asked the participant to list reasons for a missed hospital appointment and the second question asked for ways to improve the service and reduce the rate of missed appointments. The questionnaire was distributed in the morning and collected at the end of the day for a 3-week period across each clinic.

2.3 | Data validation and accuracy check

A total of 316 eligible participants was contacted by phone to participate in the survey. Of those 316 participants, 22 did not wish to participate and four had passed away. The remaining 290 participants gave their consent to participate and completed the survey. The research team entered all responses from the case report forms into a spreadsheet for analysis. To ensure that data were entered correctly, multiple data validation checks were performed. First, 50 randomly selected entries were cross-checked with the original case report forms to confirm correct entry. Another 50 entries were randomly selected and cross-checked with the entries in the final spreadsheet generated for the final analysis. Finally, a different list of 50 randomly selected entries in the final spreadsheet was cross-checked with

TABLE 3 Reasons for missed hospital appointment stated by patients stratified by themes

Theme	N (%)
Family and work obligations	60 (21.4)
Family commitments	18 (6.4)
Work commitments	17 (6.1)
Appointment was rescheduled for another day	14 (5.0)
Appointment given in Inconvenient time/date	7 (2.5)
No companion	3 (1.1)
Appointment was canceled before the appointment date	1 (0.4)
Did not receive a reminder	40 (14.3)
Forgetting the appointment	19 (6.8)
Did not know about the appointment	15 (5.4)
No SMS received	5 (1.8)
Overslept	1 (0.4)
Health Improved/Personal health issue	38 (13.6)
No need for the appointment	21 (7.5)
Patient was sick on the day of the appointment	12 (4.3)
Patient was feeling good on the day of the appointment	5 (1.8)
Gone somewhere else	35 (12.5)
Patient waited too long for the appointment	12 (4.3)
Patient went to another hospital for treatment	11(3.9)
Patient had another appointment on the same day	8 (2.9)
Patient was admitted	2 (0.7)
Had appointment before	1 (0.4)
Changed to virtual clinic	1 (0.4)
Transportation issues	34 (12.1)
Transportation problem/difficulties	32 (11.4)
Old patient cannot travel	2 (0.7)
No reason	34 (12.1)
Others	21 (7.5)
Outside the country	7 (2.5)
Confused because of the delay	5 (1.8)
Outside the city	3 (1.1)
Wrong appointment given	3 (1,1)
Confused with other appointment	1 (0.4)
Appointment for admission was given	1 (0.4)
Fasting	1 (0.4)
Covid-19	18 (6.4)
Total	280

the entries in the AL-SHIFA system. As a result, more than 53% of the data was validated in order to ensure high data accuracy. Of the 290 entries, 10 were excluded and the remaining 280 were used for final analysis. Figure 1 shows the participant recruitments and data selection process for the final analysis. The medical staff

self-administered survey responses were entered into a separate spreadsheet.

2.4 | Data analysis

Descriptive statistics were used to describe baseline characteristics of patient participants. Close-ended questions were analyzed using the total number of responses for each question. Open-ended questions were analyzed using thematic analysis, which grouped different responses into related themes.[23] Eight different themes were created for the reasons of missed hospital appointment reported by patients and seven themes were created for reasons reported by medical staff overall. To observe variability by clinic, R studio was used to perform multinomial logistic regression analysis.[24] Some of the themes created for the patient's responses about the reasons for missing their hospital appointment did not include any observation in some medical clinics and this caused the multinomial model not to preform as expected. Also, the theme titled as "No Reason" did not have an explanation about the reason for missing hospital appointment. As a result, the eight themes were regrouped into four main themes for this analysis.

3 | RESULTS

A total of 280 telephone survey questionnaires was completed. The average participant age was 45 years, with 51.8% of responses from females. Around 23.2% of patients waited 6 to 12 months for their appointments. Of all female participants, 78.6% were married and 15.7% were single. Half of the participants were from the capital city of Muscat, with an average of 46 participants for each of the six clinics with the highest number of scheduled appointments: Diabetics and Endocrine, Obstetrics and Gynecology, Oncology, Surgery, Urology, and Gastroenterology (Table 1).

Around 75.4% of the participants reported that they did receive SMS reminder for their appointment. The majority of females who reported not receiving SMS were married (90%). Only 22.5% of participants stated that they tried to call to cancel their appointment. In addition, only 31% of the female participants own a car compared with 67% male participants who own a car. However, only 57.8% of female who own a car reported that they come to their appointment using their own car and 37.8% come to their appointment with their husbands. For more details, see Table 2 and Table S1 for more details.

Each participant gave one reason for not attending the appointment. Transportation issues were the highest reported reason (11.4%), followed by no need for the appointment (7.5%) and thirdly forgetting about the appointment (6.8%). As shown in Table 3, the thematic analyses showed that family and work obligations were the highest reported theme (21.4%), followed by the theme where participants did not receive a reminder (14.3%), and then the theme health improved/personal health issue (13.6%). For all reasons stated by participants, see Table S2, and for all reasons given under "Others," see Table S3.

TABLE 4 Themes of missed hospital appointment as reported by patients stratified by medical clinics

Theme	Medical specialty						
	A	B	C	D	E	F	Total
Family and work obligations	17	3	9	11	16	4	60
Did not get a reminder	5	4	13	8	4	6	40
Health improved/Personal health issues	7	0	7	10	2	12	38
Gone somewhere else	4	2	6	3	6	14	35
Transportation issues	4	6	5	4	6	9	34
No reason	0	30	0	0	2	2	34
Others	0	7	2	3	4	5	21
Covid-19	2	2	4	4	3	3	18
Total	39	54	46	43	43	55	280

Note: A, Obstetrics and Gynecology; B, Oncology; C, Gastroenterology; D, Surgery; E, Diabetics and Endocrine; F, Urology.

Reasons for missed hospital appointment also varied between different clinics. For example, 30 responses for the reason of missed hospital appointment in the Oncology clinic fall within the theme titled as "No reason was given" compared with only two responses in the Urology clinic and two responses in the Diabetics and Endocrine clinic fall with the same theme. In Urology clinic, the most reported reasons for missed appointment were within the theme "Gone somewhere else" (Table 4). See Table S4 for more details.

Only 55 participants answered the last question about recommendations and suggestions of how to improve the appointment service. The most frequent recommendation for improvement given by the patients was to "Telephone patients to remind them and confirm attendance" (29.1%). Eight participants suggested that having an application to manage appointment rescheduling and cancellation would help to improve the appointment service at the hospital (14.5%). Seven patients suggested that a 24-hour hotline for appointment query will reduce the rate of missed appointments (12.7%) and five patients recommended that the use of telehealth/telemedicine for hospital consultation would help to reduce missed appointment as patients do not have to travel (9.1%) (See Table S5).

A total of 52 medical staff (27 doctors and 25 nurses) completed the questionnaire. There was no limit on the number of responses or answers that each doctor or nurse could give to each question. The highest reported reasons for missed appointment were transportation difficulties (31), no SMS received (22), and forgetting (20). The results of the thematic were similar to those for patient responses with one new theme titled as "Unsatisfied with the service." When ranking the themes, "Did not get a reminder" was the highest reported theme followed by "Transportation issues" and then "Family and work obligation" (Table 5). The most frequent recommendations given by the medical staff for improvement of the appointment service were increasing the number of reminders sent to patients within different time frames, use of telephone reminders, and to provide a 24-hour phone line for the hospital appointment queries (Table S6).

Finally, multinomial logistic regression analysis was performed using the different themes for missed appointment and analyzing the differences in themes between medical departments. The analysis

showed that "Family and work obligations" theme was a strong theme in Obstetrics and Gynecology clinic (odds ratio [OR] 9.48 (95% confidence interval [CI] 2.66-33.78) and Diabetics and Endocrine clinic (OR 10.55 (95% CI 2.88-38.58) compared with patients in the Oncology clinic. The theme "Did not get a reminder" was an important reason reported by patients in Gastroenterology clinic with OR of 3.70 (95% CI 1.18-11.53). Finally, transportation issues showed a strong effect with oncology patients as reason for not attending their appointment with OR of 4.83 (95% CI 1.11-21.02) (Table 6). Table S7 provides the frequency of the themes used in the multinomial logistic regression analysis.

4 | DISCUSSION

This study found that transportation issues, no need for the appointment, and forgetting were the top three reported reasons for missing an appointment by patients. In addition, analyses showed that the reasons varied between clinics. Medical staff also reported these three themes as frequent reasons for missed appointments. Recommendations for improvement given by patients and medical staff were mainly about improving the reminder SMS reminder system, using phone call reminders or increasing their frequency, and providing patients with an accessible easy-to-use appointment scheduling system.

The majority of females who stated that they did not receive SMS reminder were married. This may be because married females tend to give their husband's number as their contact number. The culture in Oman is described to be "a collectivistic and family-oriented culture" where female patients tend to depend on their husbands, fathers, or brothers, while elderly patients rely on their sons.[25] Female patients usually attend their hospital appointment with a chaperone. As a result, when females attend their appointment with their husband, fathers, or brothers, they would be the one to register their wife, daughters, or sisters for their appointment at the registration desk since there is no female staff in the female registration counter. Additionally, the male chaperone will give his number to validate the

TABLE 5 Reasons for missed hospital appointment as reported by medical staff

Medical staff	N (%)
Doctors	27 (51.9)
Nurses	25 (48.1)
Theme	
Did not get a reminder	48 (36.9)
No SMS received	22 (16.9)
Forgetting the appointment	20 (15.4)
Did not know about the appointment	3 (2.3)
Overslept	1 (0.8)
SMS was not understood by patient (sent in English)	1 (0.8)
SMS did not include clear instructions	1 (0.8)
Transportation issues	31 (23.8)
Transportation problem/difficulties	31 (23.8)
Family and work obligations	25 (19.2)
Family commitments	15 (11.5)
Work commitments	8 (6.2)
No companion	1 (0.8)
Patient postponed the appointment	1 (0.8)
Gone somewhere else	12 (9.2)
Patient went to another hospital for treatment	5 (3.8)
Patient had multiple appointments on the different days	5 (3.8)
Patient was admitted	1 (0.8)
Look for second opinion somewhere else	1 (0.8)
Unsatisfied with the service	6 (4.6)
Lack of knowledge about the importance of follow-up	3 (2.3)
Unsatisfied with treatment	2 (1.5)
Negative reputation about the hospital treatment from others	1 (0.8)
Health Improved/ Personal health issue	4 (3.1)
Patient was sick on the day of the appointment	2 (1.5)
Patient was feeling good on the day of the appointment	1 (0.8)
Passed away	1 (0.8)
Others	4 (3.1)
Covid-19	1 (0.8)
Outside the country	1 (0.8)
Financial problem	1 (0.8)
Weather condition 4	1 (0.8)
Total[a]	130 (100)

[a]Each participant could give more than one reason so the total number is greater than the total number of participants (27 doctors and 25 nurses).

appointment and to update the contact number when requested by the hospital staff at the registration counter. As a result, all future reminders will go to the contact number given at registration, not necessarily to the female patient directly, and may explain why most married females responded that they had no SMS reminder.

Moreover, even if the female patients attend the appointment alone, the majority of them will tend to provide their husband, father, or brothers phone number to be contacted for any information about the appointment. Female patients tend not to give their personal number to the hospital staff, especially male staff. Several studies looked at barriers facing Muslim female patients encounter with healthcare service providers and the unique cultural and religious concerns.[26-28] The hospital administration might assign female staff to the female counter to ensure that same gender staff operating the registration service. These changes might encourage female patients to give their personal number to be stored in the hospital system that will help to ensure that patients get their SMS reminder to the correct number.

Almost half of the married females who own a car still opted for their husband to chaperone the appointment. This is a common issue that might be related to the unique cultural aspects in the Middle East. Other studies have documented female patients reporting difficulties with transportation related to the fact that their husband was busy and could not have time off work to attend the appointment with them.[29,30] So, when scheduling an appointment for married female patients, extra attention should be given and patients should be advised to secure transportation ahead of the appointment or reschedule if transportation is unavailable. In addition, for married female patients, it might help to educate them about why it is important to have their contact details in the hospital system and request the patient to provide their personal number over the phone. This could improve the rate in which female patients rescheduled their appointments, as they will get the appointment reminders directly, ensuring they reschedule the appointment in line with their chaperone availability.

Patients who gave no reason for missing their hospital appointment were mainly from Oncology clinic. Studies had reported similar findings of high rate of missed appointment for no reasons for cancer patients.[31-33] This might be explained by the stage of the disease; for example, patients in the early stage of disease might seek a second opinion and additional advice somewhere else, or even abroad before they start any type of treatment.[34] A study conducted in 2018 reported that around 7000 Omani patients visited Thailand alone seeking medical service.[35] On the other hand, patients at end stage of disease might not be interested in continuing treatment or going through distress.[36] This problem requires more attention and follow-up from the ministry authorities and the hospital administration. It might help to introduce a position of social worker in this clinic to follow up with patients and remind them about their appointment. Social workers might help to educate those patients about the importance of attending their appointment and keeping up with their planned treatment. Educating patients about the relationship between missed hospital appointment and worsening of their condition would help to encourage them to attend. Importantly, a similar recommendation was given by the medical staff in the Oncology clinic who participated in this study.

Family and work obligation was the highest reported theme for the reason of missed hospital appointment. This included family commitments, work commitments, and appointment rescheduled for

TABLE 6   Reasons for missed hospital appointment themes OR (95% CI) by medical clinics (patient responses)

Theme	Medical department[a]				
	Obstetrics and Gynecology	Oncology	Gastroenterology	Surgery	Diabetics and Endocrine
Family and work obligations	9.48 (2.66-33.78)	5.44 (0.88-33.76)	3.84 (1.02-14.39)	4.69 (1.29-17.07)	10.55 (2.88-38.58)
Did not get a reminder	1.86 (0.48-7.21)	4.83 (0.94-24.95)	3.70 (1.18-11.53)	2.27 (0.67-7.67)	1.76 (0.42-7.44)
Personal health issues			Reference theme		
Transportation issues	0.99 (0.26-3.81)	4.83 (1.11-21.02)	0.95 (0.27-3.30)	0.76 (0.20-2.84)	1.76 (0.51-6.10)

[a]Reference clinic Urology.

another day. This finding was similar to other studies, which showed that family and work commitment were the major reasons for missed hospital appointment.[37,38] To overcome this problem and reduce the number of missed appointments related to this reason, patients should also be given the option to select the time and date of his/her appointment. This might be possible if there is a 24-hour phone line where patient can call to request any change to their appointment at any time and not just during working hours of the hospital.

The current study was limited to just one tertiary referral hospital in the capital city of Muscat. As a result, some of the findings from this study might be specific to the Royal Hospital and not generalizable to other referral hospitals. The survey was short of ensuring a high response rate. However, adding more questions may have given more detailed information from the participants, improving our knowledge and recommendations for interventions. For example, our study did not look at patient satisfaction with the services provided at the Royal Hospital. Published studies had shown that unsatisfied patients would tend to miss their appointment and seek health service somewhere else.[39] Another limitation was that our study did not have access to patient's socioeconomic status. The only indication for patient socioeconomic status was whether the patient was under the coverage of ministry of social affair. Patients under the social affair coverage were considered from low socioeconomic status. Our previous study showed that patients under the coverage of social affair were more likely to attend their appointment compared with other patients who pay all their medical service cost.[17] The strengths of this study included the variety of the outpatient clinics included in our study, the large sample size compared with similar studies, the involvements of both patients and healthcare providers (doctors and nurses). This study was the first to explore the reasons for missed hospital appointment in a tertiary Omani hospital. Finally, in-depth analysis was performed using multinomial logistic regression compared with similar studies that reported overall counts and percentages.

5 | CONCLUSIONS

In conclusion, there were varied reasons for missed hospital appointments, and the frequency of these reasons was substantially different between clinics. Knowing the reasons for missed appointment from patients and health professionals can help to develop effective interventions. Patients and medical staff suggested that SMS reminder system improvement, use of phone call reminders, and developing a more user-friendly appointment scheduling system would help to improve the service. The heterogeneity between clinics in reasons for missed appointment indicates for interventions tailored to clinic and frequent reasons.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

TRANSPARENCY STATEMENT

The manuscript is an honest, accurate, and transparent account of the study being reported, and no important aspects of the study have been omitted.

AUTHORS' CONTRIBUTIONS

Conceptualization: Tjeerd van Staa, Victoria Palin, Ahmed Alawadhi.
Formal Analysis: Ahmed Alawadhi.
Investigation: Ahmed Alawadhi, Victoria Palin.
Methodology: Tjeerd van Staa, Victoria Palin, Ahmed Alawadhi.
Supervision: Tjeerd van Staa.
Writing—Original Draft Preparation: Ahmed Alawadhi.
Writing—Review and Editing: Tjeerd van Staa, Victoria Palin, Ahmed Alawadhi.

All authors have read and approved the final manuscript version of the manuscript. The manuscript has not been submitted elsewhere.

The corresponding author had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from Ministry of Health, Sultanate of Oman, but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available.

ETHICS STATEMENT

This study was granted ethical approval from the Study and Research Centre, Ministry of Health, Sultanate of Oman on 9/2/2021 (Proposal ID: MoH/CSR/20/24172).

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.