Prevalence and Predictors of No-Show in Internal Medicine Outpatient Clinics: A Cross-Sectional Study in Saudi Arabia

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ABSTRACT

This study aimed to examine the primary causes of patient no-shows in internal medicine (IM) clinics and identify their associated predictors. This cross-sectional observational study was conducted at IM outpatient clinics of the University Medical Center at Imam Mohammad Ibn Saud Islamic University in Riyadh, Saudi Arabia from January to March 2021. Predictors of no-shows were identified using binary logistic regression analysis. The data of 211 patients were identified during the study period. Around 51.7% (n = 109) of the patients had been no-shows in the past two months, with forgetfulness (57.3%), work or house commitments (42.7%), and lack of transportation (9.5%) being the main reasons. Patients who had follow-up visits were more likely to be no-shows than those who were coming to IM clinics for the first time (odds ratio: 1.86; 95% confidence interval: 1.03-3.37; p = 0.040). This study highlights the need for targeted interventions, including enhanced appointment reminder systems, flexible scheduling alternatives, and patient education, to decrease instances of no-shows and optimize clinic operations.

Keywords: appointment, internal medicine, no-show, outpatient, Saudi Arabia

INTRODUCTION

A no-show event is a situation where a patient does not appear or cancels a scheduled appointment without prior notice. No-show events have a detrimental effect on the healthcare system[1]. The lack of patients causes disruptions in the provision of medical services. The inefficiency and reduced productivity of healthcare practitioners result in increased resource use and wasted time and expenditures within the healthcare system[2,3]. The no-show issue, therefore, exacerbates the difficulty currently faced in Saudi Arabia's overburdened public healthcare system.[4,5] Saudi Arabia has invested substantially in healthcare infrastructure and services to provide comprehensive care for a rapidly expanding population[4,5]. All of these are undermined by high no-show rates, which induce costs and inefficiencies.[1] This creates an imbalance of supply and demand, leading to long waiting periods and lower quality of care delivered to patients. Consequently, certain interventions must be implemented to resolve the issues and ensure that the healthcare system in Saudi Arabia runs effectively since cultural conditions and disparities in health literacy lead to high no-show rates.

Extensive research has been conducted on the financial impact and scale of no-shows. Studies have identified rates of patients not showing up for appointments in community hospital settings ranging from 25% to 31.1%[6,7]. The average no-show rate of 62 booked appointments per day could result in annual costs of $3 million. Additionally, the average cost per patient for no-shows is $196[8]. Failure to attend appointments also has a detrimental impact on the patients themselves. Non-attendance by patients can result in delays for other patients in accessing healthcare services due to unused appointment slots, lengthy waiting lists, decreased quality of care, negative health consequences, and patient discontent[1]. Failure to attend follow-up appointments can hinder doctors' clinical endeavors and even exacerbate patients' illnesses[9].

Decreasing the rate at which patients fail to show up for appointments can enhance the quality of patient treatment and reduce expenses and the inefficient use of resources[8]. The literature extensively recorded the most prevalent reasons for missing appointments. While the specific reasons may vary among organizations, knowing these causes is crucial to decreasing the rate of no-shows. Crutchfield and Kistler (2017) recruited a total of 251 patients from the USA for their survey[10]. The researchers found that the primary reasons for no-shows were transportation difficulties, accounting for 28% of cases, and forgetfulness, accounting for 26% of cases.

To obtain more precise justifications, Claveau (2020) categorized the causes into two distinct groups: personal and organizational [11]. The researchers found that the primary personal factors contributing to missed visits were the successful resolution of problems (22.9%) and conflicting work obligations (19.4%). In contrast, the primary organizational factors cited were the unfavorable timing of the appointment (17%) and significant waiting periods (14.6%), which refers to the duration between scheduling the appointment and the actual date of the appointment. Prior research conducted in Saudi Arabia investigated the phenomenon of patient no-shows across many medical situations, including dental problems, malignant lymphoma, individuals with scheduled magnetic resonance imaging (MRI) sessions, and breast imaging[12-15]. Aljuaid et al. examined the effectiveness of text-based reminders in the improvement of no-show rates for patients in breast imaging[13]. Brown et al. examined failure to attend appointments and loss of follow-up for patients with malignant lymphoma in Saudi Arabia and found that 34.1% of such instances were due to hospital-based communication problems, 17.6% to errors in patient communication with the hospital, 7.4% to transportation problems and 16.5% to other personal reasons[14]. A study by Alrowaili et al. in Saudi Arabia examined no-shows and factors correlating to no-shows and rescheduling MRI appointments[15]. This study found that the

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rate of no-shows or rescheduling was 34.8%. Additionally, it found that female gender and lack of education were highly associated with no-shows for MRI appointments[15]. Despite previous research examining no-shows in various medical settings, studies focusing on IM clinics in Saudi Arabia are lacking. The present survey aimed to investigate the primary causes for patient no-shows and identify the characteristics of patients to determine those at high risk.

METHODS

Study design and settings

This cross-sectional observational study was conducted at IM outpatient clinics of the University Medical Center at Imam Mohammad Ibn Saud Islamic University in Riyadh, Saudi Arabia from January to March 2021. A cross-sectional study design was deemed suitable to examine the prevalence and characteristics of no-shows among patients in IM clinics. The IM outpatient clinics of the University Medical Center at Imam Mohammad Ibn Saud Islamic University are one of the main healthcare centers in Riyadh. They provide comprehensive medical services to the Saudi community, including diagnostic, treatment and follow-up services. The University Medical Center of Imam Mohammad Ibn Saud Islamic University is a renowned healthcare facility recognized for its dedication to providing exceptional medical care and education. The center provides a variety of medical specializations and services, including primary care, surgery, pediatrics, and obstetrics.

Data collection process

The inclusion criteria for this study were patients who attended IM clinics at the University Medical Center of Imam Mohammad Ibn Saud Islamic University during the study period. The procedure of collecting data underwent several stages. Initially, the phone numbers of patients who failed to attend their appointments at IM clinics were acquired from the CAREWare database after authorization from the medical director. Furthermore, a survey study was undertaken to ascertain the distinguishing features of individuals who failed to attend appointments and the prevailing reasons behind their non-attendance. The questionnaire tool used to examine the characteristics of no-shows was developed based on previous literature. The survey was disseminated over WhatsApp. The study employed multiple-choice questions to interview persons who failed to attend their scheduled instant messaging engagements. The survey questions were created based on an analysis of the prevailing reasons for no-shows as documented in the studied literature. The survey did not require any personal information, and the data gathered were anonymized and stored in a document protected by a password. Patients were invited to participate voluntarily, and the objective of the study was clarified to them in the survey that was sent. The extracted data encompassed patients' demographic information such as gender, age, marital status, eligibility type, and education level. It also included details about missed appointments at IM clinics, such as the booking method, type of appointment, visiting time, lead time (the time between booking and attending the clinic), and reasons for missing the appointment.

Accurate data acquisition and verification of patient contact information were implemented to preserve the reliability and quality of the data. In addition, the study's inclusion criteria were rigorously applied to ensure the selection of participants, and the data were anonymized and securely maintained in password-protected documents.

Ethical approval

This study was approved by the Institutional Review Board at Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia (protocol 102-2020).

Statistical analysis

The Statistical Package for Social Science Software (SPSS), version 29 was used to analyse the data for this study. Descriptive and inferential statistics were used to present the study findings. Categorical data were presented as frequencies and percentages. Predictors of no-shows were identified using binary logistic regression analysis. Patients' demographic characteristics were used as independent variables for the logistic regression analysis. The dependent variable for the logistic regression analysis was defined as patients' no-shows. The findings of the logistic regression analysis were presented using the odds ratio with a 95% confidence interval. The significance level was assigned a p-value less than 0.05.

RESULTS

Patients' demographic characteristics

The data of 211 patients were identified during the study period. Around 51.0% of the patients were males aged 18-40 years. The majority of the patients (70.6%) were married. Around 32.0% of the patients were family dependents. The vast majority of the patients (81.5%) reported that they had a college degree or higher. Table 1 below presents patients' demographic characteristics.

Table 1. Patients' demographic characteristics

Variable	Frequency (%)
Sex	
Male	107 (51.0)
Female	104 (49.0)
Age group	
18 – 40	109 (51.7)
41 - 60	93 (44.1)
> 60	9 (4.8)
Marital status	
Single	49 (23.2)
Married	149 (70.6)
Divorced	13 (6.2)
Eligibility type	
Student	41 (19.4)
Faculty member	45 (21.3)
Admin staff	58 (27.5)
Family dependant	67 (31.7)
Education level	
Illiterate	6 (2.8)
High school	32 (15.6)
College or higher	172 (81.5)

Characteristics of missed bookings at IM clinics

Around 51.7% (n = 109) of the patients had been no-shows in the past two months. More than half of the patients who missed their appointments (65.9%) booked their appointments at the reception. Around 69.0% of the patients who missed their appointments were visiting IM clinics for follow-up. The visiting time for more than half of the patients (55.9%) who missed their appointment was afternoon. The most common lead time for missed appointments was three weeks (38.4%). For further details on the characteristics of missed booking at IM clinics, refer to Table 2.

Table 2. Characteristics of booking at internal medicine clinics

Variable	Frequency (%)
Booking method of the missed appointment	
At the reception	72 (65.9)
Via phone	37 (34.1)
Type of appointment	
Follow-up	75 (68.7)
First visit	34 (31.3)
Visiting time	
Morning (09 am – 12 pm)	48 (44.1)
Afternoon (01 pm – 04 pm)	61 (55.9)
Lead-time	
Less than a week	5 (4.7)
One to two weeks	38 (35.1)
Three weeks	42 (38.4)
More than three weeks	24 (21.8)

Reasons for appointment missing at IM clinics

Figure 1 below presents reasons for missing appointments at IM clinics. The most commonly reported reasons for missing appointments at IM clinics were forgetfulness, work or house commitments, and lack of transportation., accounting for 57.3%, 42.7%, and 9.5%, respectively.
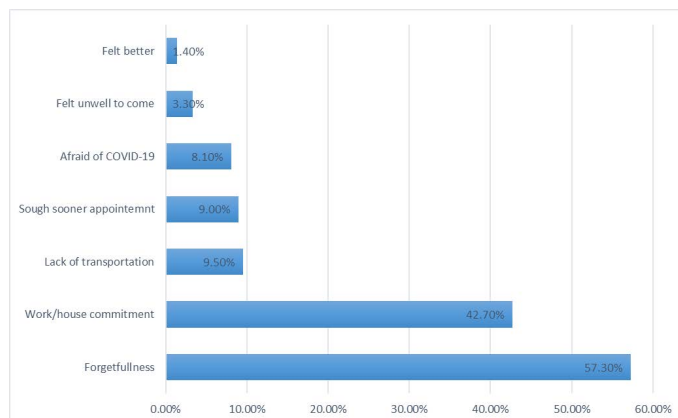

Figure 1. Reasons for missing appointments

Predictors of no-shows at IM clinics

Binary logistic regression analysis identified that patients who had follow-up appointments were more likely to be no-shows than those who were coming to IM clinics for the first time (odds ratio: 1.86; 95% confidence interval: 1.03-3.37; p = 0.040); see Table 3.

Table 3. Predictors of no-show at internal medicine clinics

Variable	Odds ratio of no-show (95% confidence interval)
Sex	
Male (Reference category)	1.00
Female	1.38 (0.81-2.38)
Age group category	
18 – 40 years (Reference category)	1.00
41 – 60 years	1.10 (0.63-1.92)
> 60 years	0.47 (0.11-1.99)
Marital status	
Single (Reference category)	1.00
Married	1.11 (0.58-2.12)
Divorced	0.43 (0.12-1.57)
Eligibility type	
Student (Reference category)	1.00
Faculty member	0.69 (0.29-1.60)
Admin staff	0.68 (0.31-1.52)
Family dependant	1.03 (0.47-2.25)
Education level	
Illiterate (Reference category)	1.00
High school	3.65 (0.61-21.78)
College or more	2.62 (0.50-13.87)
Number of comorbidities	
None (Reference category)	1.00
One	1.32 (0.71-2.46)
Two	0.83 (0.35-1.96)
Three and more	1.64 (0.59-4.57)
Living from medical centre	
5 km or less (Reference category)	1.00
5-15 km	0.78 (0.39-1.53)
More than 15 km	0.97 (0.47-2.00)
Transportation	
Diving themselves (Reference category)	1.00
With a caregiver (husband, brother, or private driver)	1.11 (0.64-1.91)
Taxi	0.48 (0.08-2.74)
Booking type	
Booked themselves (Reference category)	1.00
Referred from other clinic	0.85 (0.38-1.91)
Method of booking	
At the reception (Reference category)	1.00
Via phone	1.17 (0..66-2.06)
Type of appointment	
First visit (Reference category)	1.00
Follow-up	1.86 (1.03-3.37)*
Visit time	
Morning visit (Reference category)	1.00
Afternoon visit	0.68 (0.40-1.18)
Reason of visit	
Pain (Reference category)	1.00
Follow-up comorbidities	0.73 (0.35-1.53)
Refill medication	0.85 (0.27-2.63)
General check-up or investigation	1.03 (0.50-2.12)

*p<0.05.

DISCUSSION

No-show appointments, also called missed appointments, pose a challenge to virtually every healthcare system, causing substantial effects on revenue, expenses, and resource use[16]. These instances reduce the productivity and efficiency of healthcare providers, elevate overall healthcare costs, and constrain the effective capacity of health clinics[17]. Therefore, this study aimed to understand the prevalence and the predictors of no-shows in IM outpatient clinics in Saudi Arabia.

The study results found that more than half of the patients who missed their appointments (65.9%) booked their appointments at the reception. Receptionists play a crucial role in health care appointment booking, particularly in the implementation of new consultation approaches[18]. They are the first point of contact for patients and are involved in direct patient assessment, monitoring, counselling, and therapy[19]. In

community health centers, receptionists serve as the intake system, which has implications for both patients and receptionists[20] because making appointments is a complex social process, and receptionists are key in managing patient demand[21].

The study results revealed that around 69.0% of the patients who missed their appointments were visiting IM clinics for follow-up. In addition, the study results found that patients with follow-up appointments are more likely to be no-shows than those coming to IM clinics for the first time. A study at a Swiss university outpatient clinic confirmed our study findings and found that patients who missed appointments were more likely to be scheduled for a follow-up rather than a first-time visit[22]. Yet, in Canada, first-time patients had higher rates of no-shows to appointments[23]. Indeed, inappropriate referrals and poor communication between patients and healthcare providers play a role in patient no-shows,[24] where the negative attitudes of healthcare staff towards patients may influence intervention strategies and lead to patients missing appointments[25].

Additionally, the visiting time for more than half of the patients (55.9%) who missed their appointment was afternoon, and the most common lead time for missed appointment was three weeks (38.4%), whereas in Canada, missed appointments were made more than a week in advance of the appointment[23]. A significant proportion of no-show patients simply forgot or had no reason for missing their appointments[24]. Emotions, perceived disrespect, and a lack of understanding of the scheduling system substantially affect appointment attendance[26]. Also, in Saudi Arabia, afternoon appointments are associated with higher rates of no-shows[27].

Moreover, among the study participants, the most commonly reported reasons for missing appointments at IM clinics were forgetfulness (57.3%), work or house commitments (42.7%), and lack of transportation (9.5%). In Canada, the same reasons were reported as the main reasons for appointment no-shows, whereby forgetting the appointment was the most common reason[23]. Indeed, forgetting the appointment was the main reason for missing the appointment in many studies[23,24,28,29].

While no-shows reduce revenues and provider productivity, increase costs, and limit patient access by reducing effective clinic capacity,[16,30] overbooking appointments and using a flexible scheduling model are suggested to mitigate the impact of no-shows on clinics[30,31]. The issue of patient no-shows has been examined through various studies, each proposing different solutions. Recommendations include alternative scheduling for habitual no-show patients,[32] emphasizing the importance of patient education and providing choices in appointment reminders[28]. The significance of patient characteristics such as age, socioeconomic status, and family stability in predicting missed appointments is highlighted[33]. Strategies like mailed appointment reminders, improved communication, and personalized scheduling are also recommended to reduce no-show rates[34].

To effectively decrease the number of missed appointments in IM clinics, a thorough strategy that considers multiple factors impacting patient attendance must be implemented. The recommendations are as follows: Firstly, establish a resilient appointment notification system by employing several communication channels, including SMS, email, and phone calls, customized to suit the preferences of patients. Secondly, provide versatile scheduling alternatives such as online reservations and immediate appointments to cater to the requirements of patients. Thirdly, offer patient instruction regarding the significance of maintaining scheduled visits and the consequences of failing to attend appointments on the functioning of the clinic.

Finally, deliberately implement overbooking and establish a strategy for swiftly rescheduling any missed appointments. Examining patient demographics and appointment data can assist in identifying patterns and customizing interventions. Implementing measures to improve the clinic environment and enhance patient experience and engagement, together with offering incentives like discounts or modest rewards for attending visits, can also be helpful.

This study has multiple implications for healthcare practice. The findings of this study underscore the critical role of receptionists in the booking and administration of appointments since the majority of no-shows were associated with appointments scheduled at the reception. This emphasizes the necessity of providing receptionists with assistance and instruction regarding appointment scheduling and patient interaction. However, the finding that follow-up visits have higher no-show rates than first-time visits contravenes certain previous studies, indicating that appointment adherence may be influenced by a variety of factors in different patient populations and settings.

This study has limitations. As a cross-sectional study, it cannot examine causality among the study variables or examine trends over time. It is a single-center study, which might affect the generalizability of the findings. Further, selection bias may arise as a consequence of the dependence on phone numbers from the CAREWare database for data extraction. Furthermore, the dependence on self-reported data to explain non-attendance may be influenced by social desirability bias and recall bias. Therefore, our study findings should be interpreted carefully.

Despite the study's limitations, numerous measures were implemented to mitigate their influence and guarantee the validity of the results. The cross-sectional design was deemed suitable for evaluating the prevalence and characteristics of no-shows within a defined period. The CAREWare database was verified to reduce selection bias. WhatsApp was selected for survey dissemination due to its accessibility and widespread use among the target population. The study's emphasis on a renowned medical center in Riyadh offers a comprehensive perspective on no-shows in a major healthcare facility, which is of significant relevance to similar institutions.

To improve the generalizability of the findings of this research, future research should focus on conducting longitudinal studies that monitor no-show patterns over time and across multiple healthcare centers. Insights into the most effective strategies could be gained by investigating the impact of various communication methods, including SMS and email reminders.

CONCLUSION
Overall, the study emphasizes a substantial prevalence of missed appointments in IM clinics. Variables such as making a reservation at the front desk, appointments scheduled in the afternoon, and lengthier advance notice were linked to increased rates of missed appointments. The main factors cited for skipping appointments were forgetfulness, work or household obligations, and lack of transportation. Interestingly, patients with follow-up appointments were more likely not to show up than new patients. Targeted interventions including enhanced appointment reminder systems, flexible scheduling alternatives, and patient education should decrease instances of no-shows and optimize clinic operations. Healthcare providers and policymakers must take immediate action. By prioritizing these strategies, we can optimize clinic operations, improve resource use, and ultimately enhance patient care.

Author Contributions

Y.M.A. supervised this study in term of methodology, statistical analysis and drafting. Besides, he is responsible for conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; has agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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