ORIGINAL ARTICLE

Factors associated with absenteeism from medical appointments, Hospital Nacional Daniel Alcides Carrión

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ABSTRACT

Objective: To determine factors associated with the absenteeism from medical appointments among patients at a national hospital in Peru.
Materials and methods: An observational, retrospective and analytical case-control study among patients who either missed or attended their scheduled medical appointments. The population of absentees was 2,963, while that of attendees was 12,125 patients. The sample consisted of 126 scheduled individuals in the case group and 253 in the control group, selected by systematic sampling, considering selection criteria. From the appointment scheduling records and the medical consultation database, personal factors such as place of residence, condition at the facility, condition in the service, financing and sex as well as institutional factors such as the deferral of appointments were collected using a data collection form. The associated factors were analyzed using binary logistic regression.
Results: The absenteeism rate was 19.64 %. A total of 81.75 % of absent patients and 65.22 % of those in the control group receive medical care through the Sistema Integral de Salud (SIS, Comprehensive Health Insurance) scheme. Furthermore, 68.25 % of the absentees booked their medical appointment seven or more days in advance, compared to 51.38 % of the control group. The factors associated with absenteeism were financing (p = 0.002; OR = 2.385; 95 % CI [1.365-4.168]) and the deferral of appointments (p = 0.005; OR = 1.965; 95 % CI [1.225-3.152]). Regarding the likelihood of being absent, that of SIS beneficiaries was 2.385, while that of users who scheduled an appointment seven or more days in advance was 1.965.
Conclusions: Being a SIS beneficiary patient and the granting of an appointment deferred by more than seven days increases the probability of absenteeism from scheduled medical appointments. A process review is suggested as a part of the continuous improvement.

Keywords: Absenteeism; Treatment Adherence and Compliance; Appointments and Schedules; Insurance, Health (Source: MeSH NLM).

INTRODUCTION

It is very common for outpatients to miss scheduled appointments in hospitals. Users request consultations but do not attend on the day of their scheduled appointments.

In public hospitals, the number of appointment requests is unlimited, generally among patients who are beneficiaries of the state health insurance, particularly if there are no mechanisms to regulate patient demand [1].

Absenteeism rates for scheduled appointments range from 14.6 %, according to a study conducted in Spain [2], to 19 %, as reported in the United Kingdom [3]; other studies identify the following as main factors for absenteeism from medical visits: communication failure, advanced age [1], lack of knowledge, having double appointments, forgetting appointments, recovering from the illness [2], age over 90 years or between 16 and 30 years, low socioeconomic level and being male [3].

The absence of patients from their scheduled appointments leads to productive and economic repercussions, reducing accessibility to services, increasing morbidity and raising both the direct and indirect costs for hospitals [4,5].

The factors related to absenteeism from scheduled medical appointments are various and require a thorough analysis in order to implement strategies that can minimize it [1]. This must be accompanied by a comprehensive analysis of the overarching issue of healthcare access and patient demand, implementing new work strategies focused on the user [1,6-8].

Therefore, a study was undertaken to determine the factors associated with absenteeism from medical appointments at a Peruvian national hospital located in Callao.

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MATERIALS AND METHODS

Study design and population

A retrospective, analytical, case-control study of 379 patients who scheduled medical specialty appointments between August and September 2019 at Hospital Nacional Daniel Alcides Carrión in Callao, Peru. The target population, based on the inclusion and exclusion criteria, comprised 15,088 scheduled patients, divided into 2,963 who did not attend (case group) and 12,125 who did keep their scheduled appointments (control group).

The selection criteria for the groups were based on outpatient visits scheduled between August and September 2019 in the specialties of Cardiology, Dermatology, Endocrinology, Gastroenterology, Internal Medicine, Neurology and Pneumology in both morning and afternoon shifts; and patients of all ages were included. Appointments for procedures and those scheduled on the same day were excluded.

To determine the sample size, the prevalence of cases (p^1 = 35 %) recorded by Soto et al. [9] was considered, and for the controls (p^2), the maximum expected prevalence of 50 %, a confidence level of 95 % (Zα) and the power of 80 % (ZB) were applied. Using the formula for analytical studies [10,11], the sample size was determined to be 126 for the case group and 253 for the control group, with a 2:1 control-to-case ratio. The sample in each group was selected by systematic probability sampling.

Variables and measurements

Personal factors included residence, condition at the facility, condition in the service, financing and sex. On the other hand, deferral of appointments was considered as an institutional factor related to hospital processes. A data registration form was used, with 95.8 % validity as assessed by expert judgment and reliability of 0.7 using Kuder-Richardson Formula 20 (KR-20) [9]. Data collection was performed from the appointment scheduling records and the database of medical visits. Both sources were matched to identify those absent on the scheduled date, and data on absentees and attendees were compiled.

The sample selection in both groups was conducted by systematic sampling.

Statistical analysis

All the information was tabulated in a Microsoft Excel database and analyzed using SPPS statistical software, version 24. Binary logistic regression was applied for the bivariate analysis between personal and institutional factors with the case and control groups; and the association of the variables was compared with a significance level of 5 %. The odds ratio was calculated to assess the risk of absenteeism from scheduled medical appointments, and binary logistic regression was subsequently performed for the variables that were significant. Finally, the model was developed to calculate the probability of absenteeism.

Ethical considerations

The research was conducted respecting the bioethical principles of confidentiality and submitted to and approved by the hospital's Ethics Committee. For this purpose, the necessary permissions were obtained to access the appointment database, and the information was retrieved without identifying the patients' names or personal data. The study did not pose any risk as the documentary source was used without direct contact with the patients.

RESULTS

The prevalence of patients who were absent from medical appointments at Hospital Nacional Daniel Alcides Carrión in Callao during August and September 2019 was 2,963 (19.64 %); in contrast, the number of those who attended was 12,125 (80.36 %) (Table 1).

Table 1. Absenteeism from medical appointments at Hospital Nacional Daniel Alcides Carrión, Callao

	N	Percentage
Attendees	12,125	80.36 %
Absentees	2,963	19.64 %
Total	15,088	100.00 %

Table 2 shows that 81.75 % of the case group and 83.79 % of the control group live in the districts of Callao. The probability of nonattendance was 0.580 (*OR* = 0.58, 95 % CI 0.31:1.08). A total of 95.24 % of the patients who missed their medical appointments and 94.86 % in the control group had the characteristic of being continuing patients at the hospital; the probability of nonattendance was 0.94 (*OR* = 0.94; 95 % CI 0.32:2.74). On the other hand, 54.76 % of those who missed their appointments were continuing patients in the service, while the percentage was 54.55 % in the control group; the probability of nonattendance was 0.88 % (*OR* = 0.88, 95 % CI 0.56:1.40). According to the financing, 81.75 % of those who missed their appointments and 65.22 % of those in the control group were patients treated under the Sistema Integral de Salud (SIS, Comprehensive Health Insurance) scheme. The probability of nonattendance was 2.39 (*OR* = 2.39, 95 % CI 1.37:4.17). Moreover, 39.68 % of the patients who missed their medical appointments were women, while this percentage was 35.57% in the control group. The probability of nonattendance was 0.81 (*OR* = 0.81, 95 % CI 0.51:1.28).

Table 2. Personal factors associated with absenteeism (case group) or attendance (control group) at medical appointments

	Case *n* = 126	Control *n* = 253	*p*	*OR*	(95 % CI)
Residence					
Callao	81.75 %	83.79 %	0.08	0.58	(0.31:1.08)
Lima and others	18.25 %	16.21 %			
Condition at the facility					
Continuing patient	95.24 %	94.86 %	0.91	0.94	(0.32:2.74)
New patient	4.76 %	5.14 %			
Condition in the service					
Continuing patient	54.76 %	54.55 %	0.59	0.88	(0.56:1.40)
New patient	45.24 %	45.45 %			
Financing					
SIS	81.75 %	65.22 %	0.002	2.39	(1.37:4.17)*
Private	18.25 %	34.78 %			
Sex					
Female	39.68 %	35.57 %	0.36	0.81	(0.51:1.28)
Male	60.32 %	64.43 %			

*Statistically significant association ($p < 0.05$)
n: sample size, *p*: probability, *OR*: odds ratio, CI: confidence interval

Concerning institutional factors, Table 3 shows that 68.25 % of the patients who were absent and 51.38 % of those in the control group scheduled their medical appointments seven or more days in advance; the probability of being absent was 1.97 % (*OR* = 1.97, 95 % CI 1.23:3.15).

Table 3. Institutional factors associated with absenteeism (case group) or attendance (control group) at medical appointments

	Case *n* = 126	Control *n* = 253	*p*	*OR*	(95 % CI)
Deferral of appointments					
7 to more days	68.25 %	51.38 %	0.005	1.97	(1.23:3.15)*
Fewer than 7 days	31.75 %	48.62 %			

*Statistically significant association ($p < 0.05$), *n*: sample size, p: probability, *OR*: odds ratio, CI: confidence interval

Finally, Table 4 shows the binary logistic regression model for the independent variables that were significant, i.e., those that influenced absence from medical appointments. The Wald statistical test is significant for the variables *deferral of appointments* and *financing* ($p < 0.05$). Patients who obtained an appointment with a deferral of more than 7 days had a 1.80 times greater probability of being absent compared to those who obtained an appointment with a shorter deferral period. On the other hand, patients who belonged to the SIS scheme had a 2.11 times higher probability of being absent from medical appointments than private patients or those who self-financed their care. The confidence interval does not contain the value 1; therefore, both variables are significant.

Using the regression coefficients, the following equation is designed to predict absenteeism from medical appointments:

Absenteeism from appointment = 1 / (1+e $^{(0.9 * \text{Deferral of appointment} + 0.75 * \text{financing} - 1.60)}$**)**

Table 4. Binary logistic regression model for factors associated with absenteeism from medical appointments

	B	*SE*	Wald	df	Sig	Exp(B)	95 % CI for Exp(B)	
							Lower	Upper
Deferral of appointments	0.59	0.24	6.23	1	0.013	1.80	1.13	2.84
Financing	0.75	0.27	7.62	1	0.006	2.11	1.24	3.60
Constant	-1.60	0.26	37.41	1	0.000	0.20		

B: regression coefficient, *SE*: standard error, Wald: Wald statistic, gf: degrees of freedom Sig: associated statistical significance, Exp(B): estimation of *OR*, CI: confidence interval

DISCUSSION

The prevalence of absenteeism from medical appointments among scheduled outpatients was 19.64 % (Table 1), while another study, conducted in previous years, found a prevalence of 35 % for nonattendance (Table 1) [9]. Both results are similar to those reported in a study conducted at a Peruvian hospital of the same level, where the prevalence of nonattendance was 20.2 % [7], and to the study conducted in Costa Rica, where the annual absenteeism rate was 18 % [12]. This characteristic was also observed in a hospital in Spain, where the absenteeism rate was 12.5 % [13].

Similar data have been observed in studies performed in other countries. A study in Oman reported an overall rate of missed hospital appointments of 22.3 % [14]. Likewise, a study conducted at a clinic in Canada found that, of appointments booked for six months, 24.6 % were not kept. However, a hospital in the same country reported an overall prevalence of 7.8 % of patients who missed their scheduled visits [15]. Meanwhile, a systematic review published in 2021 reported that the average rate of missed appointments was 15.2 %, with a median of 12.9 % [16].

Considering the latest report, it can be inferred that the absenteeism observed in this study is higher than the average reported in other countries, but very similar to that observed in other Peruvian institutions. This fact raises questions about the reasons for higher absenteeism in Peruvian hospitals, which will be elucidated in the following paragraphs.

In analyzing the variable *personal factors*, patients' residence was categorized into two groups: those living in the districts of Callao and those living in the districts of Lima or other areas. No significant association was found ($p = 0.08$). This result is similar to that yielded by the study carried out in Spain, which did not find an association between absenteeism and the geographic distance from the center [5]. On the contrary, a study from a Colombian hospital found that there was an association between prenatal care abandonment and distance from the healthcare facility [17]. A similar finding was reported in a study conducted at a clinic in Canada, which found that social determinants, such as transportation, play a key role in nonattendance [18], as did a systematic review, in which transportation difficulties, among other family issues, were mentioned as reasons for missing scheduled appointments [16]. A study carried out in Colombia on the prevalence of late initiation of prenatal care found that it was associated with low socioeconomic status and not being registered with social security [19].

These results appear to depend on the geographic location of the hospital. In this case, the hospital is located on a central access road with many public transportation options, which provides the necessary accessibility.

Likewise, the fact of being a continuing or new patient at the facility is associated with absenteeism from scheduled appointments. The same occurs with the patient's condition within the service. All the reviewed studies

yielded different results. In a Peruvian hospital, it was found that being a continuing patient at the facility and in the service was associated with dropping out of outpatient consultations [7]. Furthermore, studies conducted in Canada found that 19.1 % of patients who missed an appointment had a prior history of absenteeism [15] and that new patients had a high nonattendance rate (44.4 %) among those who missed an appointment, while 19.9 % missed more than one appointment [18].

These differences may require further analysis of the reasons why new patients do not attend their medical appointments. In Peru, appointments are often granted on a long-term basis, which could lead new patients to seek other more immediate care alternatives.

The variable *financing* is significantly associated with absenteeism from scheduled appointments (p = 0.002 < 0.05; *OR* = 2.39), a result similar to that reported by Miranda Mellado in a study conducted in Colombia, which found that mothers affiliated with the subsidized scheme had lower adequate utilization of prenatal care compared to those affiliated with the contributory scheme [20]. On the other hand, a study conducted in hospitals in the north of the country found that there was no association with the type of insurance, (p = 0.202) [21]. SIS beneficiaries are more likely to miss their scheduled medical appointments, possibly because there is no system limiting the number of appointment requests. Therefore, it would be necessary to establish an adequate appointment management system.

The analysis by patient sex did not show any significant association with absenteeism from medical appointments. In contrast, a study in the United Kingdom found that men were more likely to miss them [4]. Regarding both factors, two analytical studies agree that the most important predictors of missing medical appointments were age, sex, service costs, the distance from the patient's residence to the hospital, transportation issues, waiting time, appointment day and season [14,22]. Although the study shows that the highest absenteeism rate corresponds to male users, the analysis of the association is not significant. They have more difficulty attending medical appointments, which could be due to their work obligations.

Finally, analyzing the variable *deferral of appointments*, which is related to the administrative aspect of a healthcare institution, it was found that 68.25 % of the patients who were absent from a medical appointment had scheduled it with a deferral of more than seven days, as opposed to the rest, who scheduled it with a shorter time. Thus, the probability of being absent is 1.97 (*OR* = 1.97, 95 % CI 1.23:3.15; p = 0.005). Diaz et al. found a similar result in Peru, where a significant association was observed between the dropout rate among outpatients and the delays in appointment scheduling [7]. In a study conducted in Spain, significant differences were found for the variable *delay time*. Binary logistic regression was performed, considering absenteeism as the dependent variable, and the model included the variables delay time, nationality, services, days of the week, age range and healthcare center [4]. A similar result was found by Alawadhi et al. in a third-level hospital in Oman. They identified the following predictor variables for missing medical appointments: appointment waiting time, age, sex, distance from residence, service cost, and season. Likewise, for the variable waiting time they reported an *OR* of 2.22 for Urology and 1.26 for Oncology [14]. The study performed in Venezuela reported late appointment scheduling as a cause for nonadherence to prenatal care [23]. Likewise, a study conducted in Colombia among a group of patients with gastric cancer concluded that the participants identified the administrative aspect as the main barrier to accessing palliative care services [24]. Deferral of appointments is a variable that deserves in-depth analysis. Patients who had to wait longer for their visit are more likely to miss their scheduled appointment, which could be justified in that patients seek care in other state or private entities; however, in some cases, the patient may have died if they had a severe illness [14].

The analyses suggest that there are various elements that interfere with patients' adherence to their scheduled appointments. In addition to those considered in this study, it is worth mentioning that a study conducted in Canada found that work obligations (19.4 %) were the most frequent personal reasons for missing an appointment, while inconvenient appointment time (17.0 %), delay before the appointment (14.6 %) and lack of confirmation (13.7 %) were the most frequent organizational reasons. Furthermore, the most frequent reason for not notifying about the absence was forgetting to call (55.2 %). Another study conducted in Chile mentions that one reason for not attending appointments is the waiting time for care [25].

In fact, a review study sets forth a strategy to address this issue by using artificial intelligence analysis to reduce waiting times and improve user satisfaction, thereby making appointment scheduling a strategic, tactical and operational process [26]. Given that absence from scheduled appointments results in resource loss, limits preventive care and affects users' health, another simple strategy is to implement a telephone reminder system [27], a measure that is more affordable for populations that are poor or socially disadvantaged [18].

One option would be to keep a list of patients who can fill appointment slots that have been cancelled on short notice [28]. However, this requires users who cannot attend their appointments to adopt the habit of calling in advance to explain their nonattendance.

On the other hand, current technological progress should enable the development of models to manage virtual appointments more efficiently, taking into account disease progression, logistical and infrastructure capacity, and the effectiveness of treatment and diagnosis. In fact, there are reports of benefits from these initiatives, such as a study carried out in the United States [29]

Considering the condition of the patient, healthcare institutions serve a high proportion of low-income patients with mental health and addiction issues, which take a flexible approach to scheduling, encouraging patients who frequently miss appointments or who are likely to face significant hindrances to show up when they can, especially if they have a pressing need [28].

In conclusion, patients treated under the SIS scheme and whose appointments are scheduled with a deferral of more than seven days have a high probability of absenteeism. It is recommended to implement telephone communication to confirm their attendance at the scheduled appointment, as well as to promote a nationwide study in all healthcare institutions to identify the factors associated with absenteeism from medical appointments.

In light of the above, the existing strategies and others that can be innovated, it is recommended that the hospital review the appointment scheduling process for outpatients, implement the use of information and communication technologies (ICTs), text message reminders (SMS)—as demonstrated in a study that showed that sending text messages for breast examinations significantly increased attendance rates [30]—and promote the culture of communication among users to cancel the scheduled appointment if they cannot attend, which would allow the appointment to be given to another patient.

The evidence gathered in this study will be useful for proposing solutions and making decisions by health managers who are seeking to solve absenteeism from scheduled medical appointments.

The study results provide evidence supporting the need to propose alternatives that optimize medical appointment adherence management through modern strategies aligned with the factors identified as limiting compliance.

The limitation of this research was the lack of national studies published in scientific journals.

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