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## Who did not appear? First dental visit absences in secondary care in a major Brazilian city: a cross-sectional study

Quem não compareceu? Ausências às primeiras consultas odontológicas na atenção secundária em um município brasileiro de grande porte: um estudo transversal

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**Abstract** *The study sought to identify possible factors associated with non-attendance at first dental appointments scheduled in 2011 of users living in Belo Horizonte, Minas Gerais, who were referred from primary care to different dental specialties in secondary care within the public health services of the city. A cross-sectional study was conducted based on research in secondary data bases of the public health regulatory system. The dependent variable was “no shows” for scheduled appointments, and the independent variables were age, time on the waiting list, gender, health district, and the specialty to which the individual was referred. Among the 6,428 first dental visits scheduled for 2011 in the specialties selected for analysis, 32.9 % were not performed due to the absence of the user. Bivariate analysis revealed a statistically significant association between non-attendance of the user and the five independent variables. Young adults, male, and resident in given districts who were referred to the specialties of surgery and endodontics and who waited longer on the waiting list exhibited a higher frequency of no-shows.*

**Key words** *Dental health services, Health care evaluation mechanisms, Secondary care*

**Resumo** *O estudo teve como objetivo identificar possíveis fatores associados ao não comparecimento à primeira consulta agendada em 2011, de usuários residentes em Belo Horizonte, Minas Gerais, referenciados, a partir da atenção primária, para diferentes especialidades odontológicas da atenção secundária da Secretaria Municipal de Saúde (SMSA). Foi realizado um estudo transversal utilizando-se pesquisa em base de dados secundários do Sistema de Regulação da SMSA. A variável dependente foi “não comparecimento” à consulta agendada e as variáveis independentes analisadas foram: idade, tempo na fila de espera, sexo, distrito sanitário de origem e especialidade para a qual o usuário foi referenciado. Entre as 6.428 primeiras consultas odontológicas agendadas para 2011 nas especialidades selecionadas para análise, 32,9% não foram realizadas em função da ausência do usuário. A partir da análise bivariada foi verificada associação estatisticamente significativa entre o não comparecimento do usuário e as cinco variáveis independentes. Adultos jovens, do sexo masculino, residentes em determinados distritos, referenciados para as especialidades de cirurgia e endodontia e que ficaram mais tempo na fila de espera, apresentaram maior frequência de não comparecimentos.*

**Palavras-chave** *Serviços de saúde bucal, Mecanismos de avaliação de cuidados em saúde, Atenção secundária*

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## Background

The absence of a user at a scheduled appointment without prior cancellation may be designated as a “no-show”<sup>1</sup>. One can use the acronym DNA (did not attend/no-show) to designate such an absence<sup>2</sup>. The failure of individuals to attend scheduled dental appointments has been the subject of various discussions and studies and represents a major challenge to the comprehensiveness of health care. This phenomenon is reported in the context of primary and secondary public dental services, in private practices as well as in institutions of higher education<sup>3-12</sup>. The evaluation of non-attendance at the first appointment in secondary care is important because it can impact an individual’s access to this level of care, thus compromising the continuity of health care. This problem has been investigated<sup>3-12</sup>; however, without a distinction between a failure to attend further appointments and a no-show specifically at the first appointment has not yet been resolved. This phenomenon is not limited to the dental field: other studies indicate high levels of absence in medical specialties as well<sup>3,13-26</sup>. Even with different health care models, this problem has been reported in different countries<sup>4-6,8,10,13,16,17,21,25-28</sup>.

Seven attributes of health care define its quality: (1) efficacy: the ability of care, at its best, to improve health; (2) effectiveness: the degree to which attainable health improvements are realized; (3) efficiency: the ability to obtain the greatest health improvement at the lowest cost; (4) optimality: analysis the most advantageous balance between health care costs and its benefits; (5) acceptability: the adaptation of health care to expectations, desires and values of patients and their families; (6) legitimacy: it refers to the acceptability of society in relation to health care offered; (7) equity: attribute that determines distributive justice. Public policies based on quality of care should include efficiency and effectiveness in their framework<sup>29</sup>, and the of non-attendance could impact negatively the health care. Note that efficiency is also referred to as a legal norm, inserted in the Constitution from the Brazilian Constitutional Amendment (EC) n.19/98 with the call Administrative Reform, Reform of Public Management and Managerial State Reform. The application of the principle in dealing with issues and public services is a constitutional duty of the State and of public officials<sup>30,31</sup>.

Some factors associated with failure to attend scheduled medical and dental appointments that have been reported in the literature

include: difficulties associated with transportation<sup>5,26</sup>, the distance between the unit and the service user’s residence<sup>17,26</sup>, the scheduled appointment time<sup>5,18,20</sup>, day of the week<sup>2,13,24</sup>, waiting time in the queue<sup>9,13,14,17,19,21,32</sup>, user age<sup>4,17,18,20-23</sup>, gender<sup>4,9,20-22,26</sup>, forgetfulness<sup>12,20,28,33</sup>, labor reasons<sup>5,9,12,22,26,33</sup>, illness of themselves or relatives<sup>12,33</sup>, socioeconomic status<sup>4,5,21,23,26</sup>, educational level<sup>4</sup>, perception of a lack of need<sup>4,22</sup>, travel<sup>12</sup>, prior warning about the scheduled visit<sup>22</sup>, and fear of pain<sup>4</sup>. The issue of non-attendance impacts the quality of service, compromises the final results of health care, leads to inefficiency in the utilization of structural capacity, and generates unnecessary costs to the system<sup>3,8-10,13,15,17,23,24,34</sup>. The identification of factors associated with non-attendance may contribute to an optimal use of human and physical resources, continuity of care, and greater customer satisfaction in that it can promote access to secondary care. Non-attendance at the first appointment involves postponing access to secondary care because the patient must return to primary care for a new referral.

Thus, this study aimed to identify factors associated with not attending primary dental consultations in secondary care in a large Brazilian city.

## Methods

A descriptive and analytical cross-sectional study was performed in Belo Horizonte, Brazil in 2011, using secondary data from Local Regulation System of the Brazilian National Health System (SUS).

### Study Area: Research Field

The city of Belo Horizonte is the capital of the state of Minas Gerais, which is located in southeast Brazil and has a population of 2,375,151 inhabitants<sup>35</sup>. It is divided into nine administrative regions, each represented in the public health system as a health district that belongs to the network of health care at the local level. The public health system in Belo Horizonte is composed of 147 primary health care units designed as preferential entry points for the population to access health services and secondary and tertiary care services.

The National Oral Health (NBSP), launched by the Ministry of Health in 2004, stimulated an increase in the supply of specialized dental procedures, with the implementation of the Dental

Specialty Centers (CEO)<sup>36,37</sup>. Until April 2011, the city had only one CEO enabled by the Ministry of Health (Ordinance No. 1.064/GM of July 4, 2005)<sup>38</sup>: Center-South CEO is located in the Center-South health district. Center-South CEO involves 41 dentists working in different areas: 14 professionals in endodontics; 6 in periodontics; 7 in prosthodontics; one in temporomandibular dysfunction; two in radiology; one in dentistry for patients with special needs; three in oral surgery; five in pediatric dentistry; and two in orthodontics. Approximately 4,000 consultations per month are offered<sup>39</sup>.

The flow of referrals to secondary care involves an evaluation by a professional in primary care, who, based on municipal clinical protocols, fills out a routing request. The consultation is scheduled with software called the National Regulatory System (Sisreg). The individual is referred to secondary care and is inserted in the electronic queue. The schedule for secondary care following this electronic queue. There are quotas for specialist consultations available for each basic health unit. In Belo Horizonte, dental specialties were added to Sisreg in 2006, within routine services<sup>40</sup>.

### Characterization of the universe

Referrals of individuals of both genders that were 18 years of age or older, living in Belo Horizonte, and referred by primary care to secondary oral health care of the municipality were included in this study. We evaluated data from individuals referred to the following specialties: oral surgery, endodontics, periodontics and temporomandibular dysfunction. The specialties of pediatric dentistry, dentistry for patients with special needs and orthodontics were excluded from the analysis because such individuals require an adult to accompany them to a scheduled appointment, and their appointment thus also depends on this adult in charge. The specialty of radiology was also excluded because it is a diagnostic specialty. The specialty of prosthodontics was excluded because most individuals are referred there from endodontics and are therefore not referred from primary care. Referrals of individuals with more than one primary care appointment in 2011 were excluded because it would not be possible to assess, for example, if double scheduling was indicative of the patient's no-show or if it occurred due to various clinical reasons for that individual. Non-attendances for reasons other than the absence of the patient were not assessed. The data

were supplied by the Sisreg software that belongs to the city of Belo Horizonte.

### Study variables

The dependent variable was no-show<sup>2</sup> of the user at the first scheduled secondary care dental appointment in the Center-South CEO. The five independent variables were age (stratified by median value), time on the waiting list (stratified by median value in days), gender, health district of origin and the specialty to which the user was referred.

### Statistical Methods

Data were managed with Microsoft Access (Microsoft Corporation, USA). For statistical analysis, we used the Statistical Package for Social Sciences (IBM SPSS, USA), version 19.0. All tests were conducted with a significance level of 5%. Pearson's chi-squared test was used to compare the dependent variable with the categorical variables (age, time on the waiting list, gender, health district, and specialty). All variables that presented a significance level less than 0.20 in the bivariate analysis were included in the multivariate Poisson regression with robust variance. The measure of association was the prevalence ratio (PR) with a confidence interval (CI) of 95%. This was estimated by the multivariate analysis and the Wald test. Values of  $p < 0.05$  were considered to be significant.

### Ethical Aspects

The study was submitted to and approved by the Ethics Committee for Human Research of Federal University of Minas Gerais in the city of Belo Horizonte.

### Results

In 2011, 9,116 consultations were scheduled for the specialties included in this study. Of this total, we excluded the first consultations of individuals with more than one appointment scheduled in the same year and those of individuals under 18 years old. Thus, we evaluated 6,428 first consultations. Of these, 4,284 had performed clinical care and 2,144 had not. Among the first consultations that did not result in service performed, 2,118 were due to the non-attendance of the individuals themselves, four were related to the absence

of the professional in charge, and 22 were due to other reasons, which were not specified in the Sis-reg information system. The first consultations that resulted in no service performed due to the absence of the professional or other reasons ( $n = 26$ ) were excluded because the event of interest is the non-performance of clinical care due to the absence of the individual. Thus, the universe was composed of 6,402 (100%) first consultations of individuals 18 years of age or older who had either received clinical care ( $n = 4,284$ ; 66.9%) or had not ( $n = 2,118$ ; 33.1%) (Figure 1).

The highest percentage of no-shows to the first appointments occurred in the specialties of dental surgery (40.3%) and endodontics (35.9%) ( $p < 0.001$ ). Males had a higher percentage of no-shows (35.7%) than females (31.9%) ( $p = 0.003$ ). The largest percentage of no-shows was from

those referred from South Central (38.90%) and East (37.70%) districts ( $p = 0.001$ ). Younger individuals had a higher frequency of no-shows ( $p < 0.001$ ), and the longer individuals spent in a queue, the higher frequency of no-shows ( $p < 0.001$ ) (Table 1).

Using a multivariate analysis (Table 2), the variables of time in the queue, age, gender, health district of origin and the specialty to which the user was referred were independently and significantly associated with non-attendance in the first specialized dental consultation. Male individuals attended appointments less often when compared to females. Individuals from the South Central and East districts showed up less often than those from the Venda Nova district. Individuals referred to the specialty of endodontics and oral surgery had significantly higher frequencies

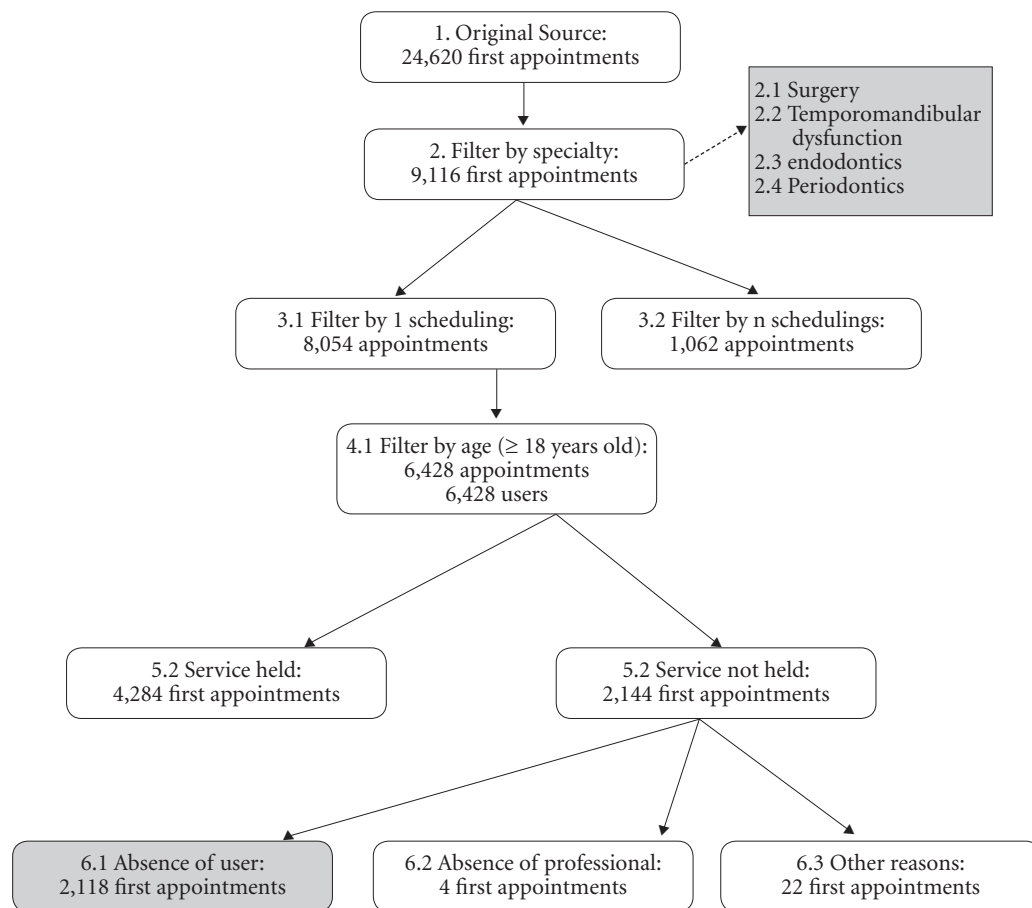


Figure 1. Flow chart of population sample.

**Table 1.** Bivariate analysis of factors associated with no-shows at first dental appointments in secondary care, Belo Horizonte, Brazil, 2011.

Variable	No-shows	Attendances	p-value*
Time on the waiting list			<0.001
Until 197 days	1.287 (60.1%)	1.935 (35.9%)	
More than 197 days	831 (73.9%)	2.349 (26.1%)	
Age			<0.001
Until 33 years	815 (74.7%)	2.405 (25.3%)	
More than 33 years	1.303 (59.1%)	1.879 (40.9%)	
Gender			0.003
Male	713 (35.7%)	1.284 (64.3%)	
Female	1.405 (31.9%)	3.000 (68.1%)	
Health District			0.001
South Central	147 (38.9%)	231 (61.1%)	
East	258 (37.7%)	427 (62.3%)	
Pampulha	174 (35.0%)	323 (65.0%)	
North	312 (34.9%)	582 (65.1%)	
West	240 (34.0%)	466 (66.0%)	
Northwest	223 (31.3%)	490 (68.7%)	
Northeast	327 (30.9%)	732 (69.1%)	
Venda Nova	238 (29.9%)	561 (70.2%)	
Barreiro	199 (29.7%)	472 (70.3%)	
Dental Specialty			<0.001
Surgery	707 (40.3%)	1.048 (59.7%)	
Endodontics	1.138 (35.9%)	2.028 (64.1%)	
TMJ Dysfunction	9 (23.7%)	29 (76.3%)	
Periodontics	264 (18.3%)	1.179 (81.7%)	

\* Pearson's Chi-squared test.

of non-attendance in relation to those referred to the specialties of periodontics or temporomandibular dysfunction. Younger individuals exhibited a higher frequency of no-shows, and a higher frequency of absence was observed with a longer time spent in a queue.

## Discussion

From this descriptive and analytical cross-sectional study, it was determined that the non-attendance of individuals to secondary dental care is multifactorial and an important issue for the service organization.

Even though software to assist in the regulation of secondary healthcare consultations exists in this large city, it was not sufficient to reduce the percentage of no-shows for scheduled dental visits in the recent years. This remained around approximately 30% while the quantification and qualification of factors associated with the problem were ordered by public policies with the aim of finding a solution<sup>41,42</sup>.

The time on the waiting list, as it related to organizational aspects<sup>22</sup>, was a factor associated with no-shows. Some studies showed that the time in the queue is a strong predictor of individuals' no-shows<sup>9,13,14,17,19,21,32</sup>. In high-need cases (perceived by the patient), a long wait for treatment in secondary care can lead to a search for alternative solutions, either through private services or even returning to primary care (e.g., for emergency care).

Although there are municipal protocols for each dental specialty to refer patients to secondary care, no assurance can be given that these patients will be closely followed by primary care professionals. Additionally, inadequacies can exist in the process of making referrals<sup>18,43</sup>; for example, clinical reasons underlying a need for a referral might best be solved by an individual's own primary caregiver. Thus, an increase in the effectiveness of primary care<sup>18</sup> and the appropriate referrals<sup>18,43</sup> may contribute to a reduction of time spent in a queue<sup>12,28</sup>.

The institutionalization of the practices noted previously<sup>12,18,44</sup>, with effective intervention



**Table 2.** Multivariate analysis of factors associated with no-shows at first dental appointments in secondary care, Belo Horizonte, Brazil, 2011.

Variable	PR	CI 95%	p-value
Time on the waiting list			< 0.001
Until 197 days	1		
More than 197 days	1.11	1.08-1.14	
Age			< 0.001
Until 33 years	1.09	1.06-1.12	
More than 33 years	1		
Gender			0.001
Male	1.04	1.02 – 1.07	
Female	1		
Health District			
Venda Nova	1		
East	1.06	1.01 – 1.11	0.011
Central South	1.07	1.02 – 1.14	0.013
Pampulha	1.05	0.99 – 1.10	0.088
West	1.03	0.98 – 1.08	0.266
North	1.03	0.98 – 1.07	0.274
Northeast	1.00	0.96 – 1.04	0.855
Northwest	1.00	0.95 – 1.05	0.921
Barreiro	0.98	0.94 – 1.03	0.372
Dental specialty			
Periodontics	1		
Surgery	1.11	1.07 – 1.15	< 0.001
Endodontics	1.08	1.05 – 1.12	< 0.001
TMJ Dysfunction	0.96	0.84 – 1.09	0.503

procedures aimed at reducing wait lists or even increasing the number of vacancies, can positively impact the number of appearances for first consultations of secondary care. For example, one can periodically update wait lists by checking for changes in the patient's address, phone contact, death or even the completion of treatment in other services<sup>12</sup>. No information is available on whether a patient has been properly informed by a dentist's primary caregiver about the nature and importance of the specialized treatment to which that patient was referred<sup>22</sup>; neither was information available regarding a patient's perceived need to wait in a non-physical queue or to cancel appointments in cases in which the patient no-showed or opted for private service.

In endodontics, one possible explanation for the large number of no-shows could be that patient perception of a delay in obtaining specialist treatment led to a search for endodontic treatment in the private sector or even to extraction of the tooth (especially in cases involving pain,

which would make a specialized consultation unnecessary). If the patient were to proceed in this way and not cancel the scheduled appointment, his absence will be recorded as a no-show<sup>2</sup>. However, it is possible that no-shows in dental surgery could be associated with a fear of generating absences at work or an inability to perform productive activity at work due to a possible need to rest after a procedure. Another hypothesis is that no-shows could be related to subjective perceptions, such as fear or phobias of an invasive treatment or harm associated with surgery<sup>44</sup>.

A significant association was determined between the no-shows and the age of the individuals, as the frequency was higher among younger adults, which is in accordance with previous results reported in the literature<sup>4,17-23</sup>. One possible explanation for no-shows in this group could be labor reasons<sup>5,9,12,22,26,33</sup> related to economically active age groups, making the attendance at secondary care more difficult. In addition, there is the possible resistance of employers to accept dental treatment certificates as allowances of absence from work<sup>12</sup>. A possible solution would be to offer alternative care shifts that could serve people who are unable to receive care during business hours.

There was an association between the no-shows and the gender of the user, which was significantly higher among men<sup>9,21,22</sup>. This may be related to the distribution of males and females in the labor market, with more men working in the formal market, which might hinder their attendance at scheduled appointments that have been assigned by the secondary care service according to availability. According to the International Labor Organization, there is a disproportionate concentration of women in part-time work and informal jobs compared to men; women's access can be limited to certain jobs because of their reproductive roles or because they assume the main responsibility for the care of children or dependents<sup>45</sup>. The greater integration of women in the informal market (compared to men) may contribute to increased opportunities for attending medical appointments.

Studies have shown that women utilize more health services than men<sup>46,47</sup>. Indeed, in this study, there was a significantly higher number of females that attended first-time appointments in secondary care ( $n = 4,405$ ) compared to males ( $n = 1,997$ ). This may mean that more women were treated in primary care and referred to secondary care. The larger turnout among women could also be attributed to differences in perceived need

between the genders and a possibly higher value placed on health by women. Although there is no consensus in the literature, studies have indicated a greater association of consultation no-shows among females<sup>4,26</sup>. This discrepancy may be due to different methodologies or even the socio-cultural characteristics of the population, as observed in studies conducted in the United Arab Emirates<sup>4</sup> and Saudi Arabia<sup>26</sup>.

A lower percentage of attendance was found for consultations among individuals of the Central-South health district, where the Central-South CEO. Therefore, in this case we cannot relate the absence of individuals with the geographic distance of the specialized care unit. Previous studies have identified an association between non-attendance and low socioeconomic status, and the Central-South health district is marked by strong social inequalities<sup>4,5,21,23,26</sup>. Because there is no data on the socioeconomic status of each individual studied, it is difficult to evaluate this association. Moreover, despite the existence of the protocols mentioned for referring users to secondary care, organizational characteristics of health centers belonging to different health districts should be considered because these could determine the percentage of no-shows. These aspects deserve further investigation to achieve a better understanding of the phenomenon.

In addition to the economic impacts to the health care system<sup>3,9,10,13,15,17,23,24,34</sup>, non-attendance at the first specialized dental appointments also implies a delay in an individual's access to secondary care in this large city because they will need to return to primary care to be re-examined by the general dentist before another referral is made, which returns individuals to the waiting list again. The discontinuity of secondary care dental treatment can compromise the comprehensiveness of care, in relation to the interface between primary and secondary care<sup>48</sup>, and can impact care outcomes<sup>15,17-23</sup>. The user may even return to primary care as an emergency case, thus overloading the primary care practitioners.

We worked with secondary data, which were restricted the listed variables and were not sufficient to discuss all possible obstacles to the non-attendance of the individuals to primary dental consultations in secondary care. An available database for subsequent analysis should include other variables, such as the socioeconomic status of the user, her/his schooling level, and her/his occupation at the time of scheduling, as well as an updated registration form with an address and telephone number.

It is not possible to confirm whether individuals have been warned about a scheduled appointment in a timely manner so that they might plan for attendance<sup>22</sup> and reschedule previous commitments if necessary. Moreover, it is not known whether addresses and telephone numbers in the database were updated for the primary contact. In this were the case, an absence of a consultation in secondary care could be due to an inability to make contact, as opposed to a deliberate absence. Furthermore, the nature of this study did not allow for the verification of whether a non-attendance was due to a perceived need by the individual<sup>4,22</sup> or due to limited information about their own health needs. It is not known whether an individual was duly informed by the dentist as to the primary reason for the referral or about the features and importance of the required specialized treatment. It is also not known whether individuals were informed about the importance of communicating to the secondary care provider in a timely manner in the event of cancellation so that another appointment could be scheduled.

In an effort to reduce no-show consultations and to achieve better utilization of capacity, several proposals have been presented in the literature, including models developed from secondary data that can be used as predictors of no-shows by managers<sup>17</sup> and reminder systems<sup>19</sup>. Furthermore, in order to circumvent professional idleness and inefficient utilization of the capacity generated by a patient's non-attendance at scheduled appointments, mechanisms such as overbooking can be implemented. There are studies that have aimed to improve overbooking techniques, based on sophisticated mathematical model propositions<sup>34</sup>. However, it is important that the pursuit of efficiency in dealing with public assets does not conflict with the humanization of care, which can occur when individuals who are overbooked attend an appointment but fail to obtain the care they need.

Bearing in mind the continental character of Brazil, these results cannot be extrapolated to the rest of the country. However, in addition to working with a reliable database, our study used a representative sample on the topic, including different specialties in a large municipality. Furthermore, we analyzed the non-attendance specifically at first consultations, which did not occur in the studies reported previously<sup>1,3-6,8-10,13-21</sup>.

Additionally, we found that not attending the first consultation compromised and delayed access to secondary care. In cases involving non-attendance of returning individuals, it is common



for providers to develop mechanisms to provide other opportunities for these individuals to continue treatment. Thus, the associations identified in this study should be considered in the planning of public health services.

The preparation of consistent proposals for interventions that aim to tackle this problem requires in-depth knowledge. Issues pertaining to the subjectivity of an individual may result in concealing complexities, which could substantiate and justify the use of a qualitative approach. In addition, an evaluation of this phenomenon

from the perspective of different social participants in health services may also be valuable.

## Conclusions

A high proportion of young adults and males that lived in one of the studied regions in Belo Horizonte who had been referred to surgery and endodontic specialists and who waited in queues for long periods of time exhibited a higher frequency of no-shows at first scheduled dental appointments in secondary care.

## Collaborations

AT Machado participated in the conception and study design, data collection and analysis, the interpretation, and the organization of the article. MAF Werneck participated in the data analysis and in the organization of the paper. SD Lucas participated in the conception and study design and in the organization of the paper. MHNG Abreu conceived and coordinated the study and participated in data collection and analysis, interpretation, the writing of the article. All authors read and approved the final manuscript.

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