

Prevalence and Factors Associated with Missed Appointments in Pediatric Dental Office: A Retrospective Analysis

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ABSTRACT

Background: Missed appointments (MAs) tend to be common occurrences in dentistry and yet there are very few studies that have explored their prevalence and associated factors.

Materials and methods: The present cross-sectional study was conducted over a period of 1 year to determine the prevalence of MAs and their associated factors. The patient's demographic data and treatment types associated with MAs were recorded and behavior was identified using the Frankel's behavior rating scale. Additionally, parents' reason for missing the appointments and qualification of the treating doctor were recorded. The statistical analysis was done using the Chi-square test where a p value of less than 0.05 was considered statistically significant. Significant traits were further evaluated using the odds ratio.

Results: Endodontic treatments reported the most MAs followed by orthodontic treatments. The most common reason for MAs was that as the symptoms and problems had resolved, it was deemed unnecessary to continue with treatment, despite the procedure being not complete. Children treated by postgraduate students and children with a positive behavior were deemed to be less likely to miss appointments. Treatment delay was determined to be the single most important predictor of MAs ($p = 0.000$).

Conclusion: Delay in treatment is a definite cause of inconvenience to both the children and their parents/supervisors and as such elimination of the same could provide better appointment compliance in children.

Keywords: Frankel's behavior rating scale, Missed dental appointments, Pediatric dentistry, Treatment delay.

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INTRODUCTION

Missed and cancelled appointments not only delay important health care for individuals, they also pose a number of challenges for healthcare systems, including wasted resources, longer wait times, and concomitant threats to future patient satisfaction.¹ During times that patients do not attend, the operations of the clinic continue and staff are paid, with no tangible productivity recorded. Opportunities are forgone to provide care to other patients if appointments are not attended. In a training facility, it has further impacts on the clinical experiences and operating hours of the students.² No-show rates in literature seem to be varied with values of as low as 3% and as high as 80%.³ Demographic factors associated with nonattendance of appointments include sex and age.^{2,4} In addition, behavior management problems of the child patient, the type of treatment, and delay in providing treatment have also been known to be associated with missed appointments.⁴⁻⁶ Thus, the present study was conducted with the objective of determining the rate of MAs over a period of 1 year in a government dental college and also to evaluate the factors associated with such an absence.

MATERIALS AND METHODS

The present retrospective study was conducted in the Department of Pediatric Dentistry, Rajah Muthiah Dental College and Hospital, Tamil Nadu, India, with data gathered from June 1, 2017 to May 31, 2018. A total of 887 (549 males and 338 females) child patients who required treatment for more than a single sitting during the above period were identified. The parental consent was obtained after clearly explaining to them the scope of the present study and assuring them that the children would not be identified in the study. The patient's demographic data were recorded (Table 1).

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The children were classified into one of the following age groups: infant (ages 4 weeks-1 year); toddler (ages 1-3 years); preschooler (ages 4-6 years); school-aged children (ages 6-13 years); adolescent (ages 13-19). The treatment types associated with MAs were recorded. In a brief interview with the parent, it was determined what they thought was the cause of the MA. The patient's behavior was determined using the Frankel's behavior rating scale.⁷ Also data regarding the qualification of the treating doctor and treatment delay, if any, after the initial contact were obtained. The Chi-square test was used to determine the associations and a p value of less than 0.05 was considered as statistically significant. A statistically significant association was further analyzed using the odds ratio.

Table 1: Missed appointments and their association with patients' gender, behavior (Frankel's behavior rating scale), qualification of the treating doctor, and delay in treatment after initial contact

| | | Missed appointments (n = 248) | Appointments not missed (n = 639) | Chi-square/ p value |
|--|---------------------|----------------------------------|--------------------------------------|---|
| Gender | Male | 149 | 400 | Chi-square—0.48, p value—0.48* |
| | Female | 99 | 239 | |
| Age | Infant | 22 | 40 | Chi-square—5.01, p value—0.28* |
| | Toddler | 30 | 59 | |
| | Preschool | 96 | 241 | |
| | School-aged child | 68 | 198 | |
| | Adolescent | 32 | 101 | |
| | | | | |
| Behavior [‡] | Definitely negative | 28 | 61 | Chi-square—1.22, p value—0.74* |
| | Negative | 115 | 284 | |
| | Positive | 70 | 196 | |
| | Definitely positive | 35 | 98 | |
| Doctor qualification | Undergraduate | 54 | 123 | Chi-square—1.72, p value—0.42* |
| | House surgeon | 71 | 168 | |
| | Postgraduates | 123 | 348 | |
| Delay after initial contact in days | 0 | 30 | 209 | Chi-square—180.91, p value—0.00 [†] Odds ratio—1.761 (CI = 1.596–1.943) |
| | 1 | 33 | 144 | |
| | 2 | 22 | 111 | |
| | 3 | 37 | 96 | |
| | 4 | 50 | 56 | |
| | 5 | 76 | 23 | |

*Not significant, [†]Significant, [‡]Frankel's behavior rating scale

Exclusion Criteria

The patients who were not required to have more than one appointment for their treatment and patients for whom the parental consent was not available were excluded from the present study.

RESULTS

A total of 887 child patients participated in the present study of which 248 presented with MAs. Thus, the prevalence of MAs in the present study was 28%. On interviewing the parents/guardians, it was determined that the most common reason for MAs was that they thought the "symptoms and problems had resolved" (Fig. 1). Endodontic treatments reported the most MAs followed by orthodontic treatments (Fig. 2). A total of 99 females and 149 males presented with MAs and the association between sex and MAs was not statistically significant ($p = 0.48$). Missed appointments were more with the younger age groups ($p = 0.28$), declining behavior ($p = 0.74$), and lesser qualification of the treating doctor ($p = 0.42$), but none of these associations were statistically significant. With an increase in the delay after initial contact and treatment, the prevalence of MAs increased and this association was found to be highly statistically significant ($p = 0.00$) (OR = 1.761, CI = 1.596–1.943) (Table 1).

DISCUSSION

Missed appointments are problematic not only because they incur financial costs to health services, increase waiting times, and are potentially detrimental to family-provider relationships but also because children often still require treatment and so are at risk

of avoidable negative health outcomes.⁸ Considering the effects of MAs on treatment outcomes, predictors of patient compliance behaviors may be useful in circumventing cancellations and no-shows.⁹

A search of the PubMed database was conducted on July 30, 2018, with the following keywords: "cancelled dental appointments," "dental no-shows," and "missed dental appointments." Only papers published over the past 10 years were considered. These were then screened for relevance, i.e., papers reporting prevalence of missed dental appointments and/or the associated factors were selected. As papers reporting missed dental appointments exclusively in children are rare, it was decided to include studies that presented some data on subjects less than 18 years of age. Four such studies were identified during the said period and a brief overview of the selected papers is presented in Table 2.

In the present study, the prevalence of MAs was determined to be at 28%, which is closest to the study reported by Machado et al.¹⁰ Education among the parents regarding the importance of oral hygiene and the consequences of missing the appointment on the treatment procedures is important.

In the present study, the parents/guardians reported to have missed an appointment as they thought the "pain and symptoms had been resolved" and the most common type of treatment that was missed was of the endodontic nature. Endodontic treatment involves procedures like pulpectomy, pulpotomy, root canal treatment, etc. Most of these treatment procedures often result in complete pain resolution in the first appointment but the treatment needs to be completed in order to prevent failure in the future. The parents/guardians are probably ignorant to this fact and therefore

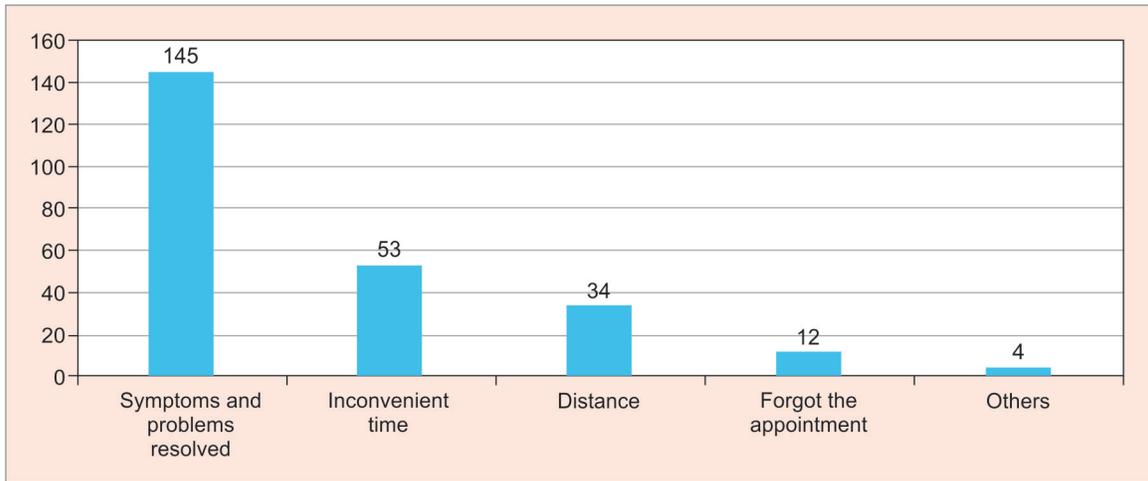


Fig. 1: Parents' reasons for missing appointments

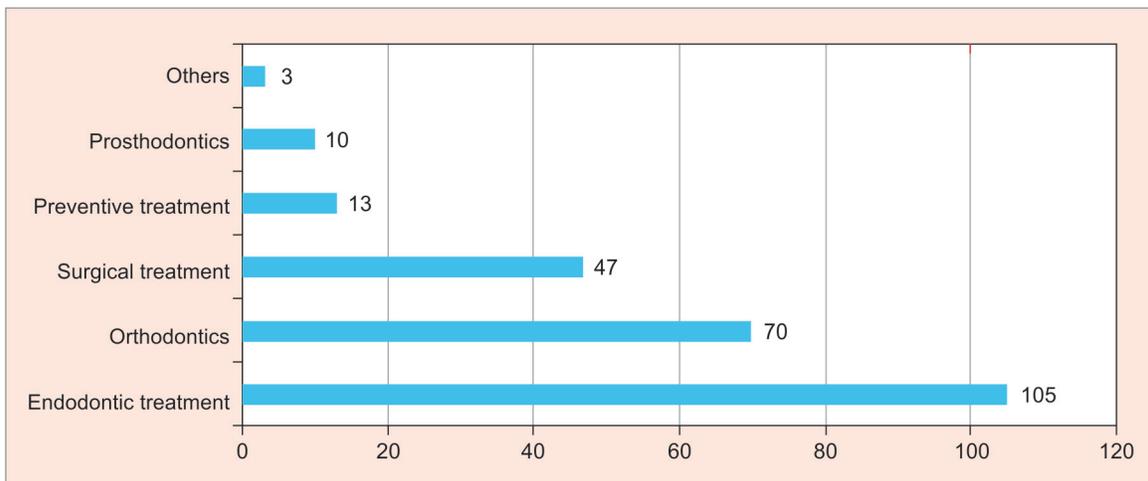


Fig. 2: Treatment types associated with missed appointments

do not seem to think it prudent to complete the treatment thus causing MAs. It has been previously reported that the parents/guardians of children in the region have poor knowledge in regards to their child's oral health.¹⁰ It has also been previously reported that patients were less likely to attend future appointments if they experienced an improvement in the symptoms of a condition in which ongoing care was required.¹¹ It must be emphasized that pain relief is not the only objective but restoration of oral structures to a normal state is essential to provide proper oral health and thereby improve the quality of life. Educating and creating dental awareness among the parents/guardians by providing a comprehensive pretreatment counseling would be preferable.

In the present study, females had slightly higher rate of MAs when compared to males but the association was not statistically significant. Previous studies have reported contradictory views in this regard with some suggesting males are more likely to miss treatments^{4,12} and others suggesting females.²

The younger children were more prone to miss appointments than the older ones in the present study, which was similar to Lalloo and McDonald² and Storrs et al.⁴ The nonattendance among younger patients suggests that specific strategies to improve patient attendance for this group need to be implemented. Improvement may require more than an SMS reminder, such as a

telephone call more than 24 hours in advance of the appointment followed up with the SMS reminder 24 hours in advance of the appointment. If nonattendance in the younger group were reduced, the number of clinical teaching hours lost would be considerably reduced.

The better qualified doctors (postgraduates) showed lesser MAs in the present study but the association was not statistically significant, which was similar to a previous study reported by Teich et al.¹³ Dental schools are a special case of health care providers because, in addition to services provided, the educational component is a part of the institutional mission. The better performance of postgraduate students could be explained by their more extensive training and increased exposure in treating child patients.

Children with negative behaviors were more likely to have MAs but this association was also not statistically significant.

Delay in treatment after the patient was first examined by the dentist had a profound impact on the possibility of patients missing future appointments. The highest rate of missed appointments was noted when this delay was by 4 or 5 days. This association was highly statistically significant ($p = 0.00$) and the odds ratio gave a value of 1.761. This would suggest that with every single-day delay in treatment the chances of a patient missing the appointment

Table 2: A brief overview of studies in PUBMED database relating to prevalence and causes of missed dental appointments in children over the past 10 years

| Study | Type of setting | Study size | Country | Appointment status | Demographic associations (probability of MA [†]) | Other reported causes/associations (probability of MA [†]) |
|------------------------------|---|------------|--------------------------------------|--|---|---|
| Lalloo ² | Rural student dental clinic training facility | 3,042 | Australia | FTA* was 21.3%, cancelled appointments 13.7% | Females higher than males Younger patients higher than older patients Public patients higher than private patients | Friday highest and Monday lowest, last day of appointment has greater MAs than first day of appointment |
| Storrs et al. ⁴ | Dental school clinic | 58,622 | Australia | 23% canceled, and 9% were FTA* | Males more than female, younger patients greater than older patients, public patients less likely to cancel than private patients | Residing within gold coast more MAs than residing outside gold coast; emergency appointments (least), endodontic treatments (highest) |
| Machado et al. ¹⁰ | Patients referred from primary care to different dental specialties in secondary care within the public health services of the city | 6,428 | Belo Horizonte, Minas Gerais, Brazil | 32.9% | Greater MAs among young adults, male, and resident in given districts | Greater MAs among those who were referred to the specialties of surgery and endodontics and who waited longer on the waiting list |
| Tandon et al. ¹² | Dental college | 4,982 | Rajasthan, India | 38.6% | Greater MAs among males but not statistically significant | Pulp therapy (highest) |
| Fägerstad ¹⁵ | Retrospective data from public dental health service | 10,158 | Orebro County, Sweden | 13.1% | Greater MAs among males | Dental fear, behavior management problems, history of more oral health problems and more invasive dental treatments |

*Failed to arrive, [†]Missed appointments

would increase by 1.761 times. Gallucci et al.⁶ has reported a similar association between treatment delay and MAs. More importantly, the rate of kept appointments will be affected most significantly with each day of delay until the scheduled appointment.

It would be desirable that treatment be started on the day of initial contact as this has shown to result in least loss of appointments. In circumstances when a delay is unavoidable, it could be useful if the clinicians use some form of reminders like telephonic reminder to constantly notify the patient of the appointment.

Missing appointment creates a series of problems. First, it deprives another patient the opportunity of getting treated. Second, it contributes to the development of a long waiting list for dental services. Third, it affects the patient's treatment time and may cause increase in the dental emergencies leading to a disruption in the doctor-patient relationship and behavioral management problems.¹⁴

LIMITATION

The present study was conducted in a government dental college and hospital. Appointment could be fixed only during working hours of the college (day time) and the hospital tends to be closed on Sundays and public holidays. Most of the parents of children who seek treatment belong to low socioeconomic status and most of them are dependent on daily wages. Thus, turning up for child's treatment would often result in loss of a whole day's pay for the family, which could have made them reluctant to appear for scheduled appointments thereby contributing to the high rate of MAs in the study. This is particularly evident from the fact that inconvenient time was quoted by parents as the second most common cause for MAs in this study. This aspect is not immediately modifiable. However, it could be considered to pass a policy decision enabling a special time slot to manage the child patients during nonoffice hours and holidays.

It is also recommended to conduct a longer-duration study with larger sample size to help understand MAs better.

CONCLUSION

There is a growing expectation in health care for organizations to provide excellent patient experiences and quality care. To meet these needs, it is extremely important to become operationally efficient and effective. This means reviewing workflows and filling in gaps to streamline workflows. Patients' not attending, either due to cancellation or absence from appointments, may have significant consequences on productivity of the hospital.

Clinical learning in pediatric dentistry is principally centered around the provision of patient care and thus MAs could result in missed opportunities in the clinical experience gained by dental students.

Appointment scheduling is an important aspect of clinical practice. Centralizing the intake process and using dedicated staff and patient management softwares to accept referrals and accommodate more timely appointments for the initial intake may help reduce the rate of no-shows and cancellations.

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