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Missed appointments in an adolescent outpatient clinic: descriptive analyses of consultations over eight years

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Summary

Question under study: Missed appointments represent an important medical and economical issue. Few studies on the subject are reported in the literature, particularly regarding adolescents. Our aim was to characterize missed and cancelled appointments in a multidisciplinary outpatient clinic for adolescents, to assess the effectiveness of a policy aimed at reducing missed appointments by introducing payment for those missed appointments not cancelled in advance, and to compare the rates between staff and resident physicians.

Methods: A total of 32,816 consultations (representing 3577 patients aged 12–20 years, 82.4% females) between 1999 and 2006 were analysed.

Results: The missed appointment rate was 11.8% whilst another 10.9% were cancellations. Females cancelled more than males (11.3% vs. 8.4%, AOR 1.31, 99% CI 1.08–1.59), but there was no difference for missed appointments (11.7% vs. 12.3%, AOR 0.88, 99% CI 0.71–1.08). April and June to October (vacation months) were associated with more missed appointments. Globally mornings had higher rates of missed appointments than afternoons (13.6% vs. 11.2%, AOR 1.25, 99% CI 1.11–1.40). There was a slight difference in missed appointment rates between staff physicians and residents (10.4%; 11.8%, AOR 1.20, 99% CI 1.08–1.33). Missed appointment rates before and after the new policy on missed appointments were similar (1999–2003: 11.9%; 2004-2006: 11.6%, AOR 0.96, 99% CI 0.83–1.10). Conversely, cancellation rates increased from 8.4% (1999–2003) to 14.5% (2004–2006) (AOR 1.83, 99% CI 1.63–2.05).

Conclusion: Attendance rates among adolescents show variations depending on vacation and school hours. Being attentive to these factors could help prevent missed appointments. Although having to pay for missed appointments does not increase attendance, it increases cancellations with the advantage that the appointment can be rescheduled.

Key words: adolescent, adolescent health services, adolescent behaviour, continuity of patient care, physician-patient relations

Introduction

Patients missing appointments is a well-known problem among each speciality in medicine, accounting for a substantial part of scheduled appointments. Rates reported in general practices in the United Kingdom range between 4% and 12% [1]. These rates differ within specialities: paediatrics and psychiatry are more affected with reported rates of 31–40% [2, 3]. This failure to attend is a medical problem. Two studies conducted in psychiatry show that patients missing appointments are more likely to be admitted to hospital [3] and to consult in emergency [4]. By missing the consultation, the patient misses the scheduled intervention, be it therapeutic or preventive. Additionally, it is also an economical problem, accounting for a loss of practice income [5].

Young adults have the highest risk of failing to attend their appointments [1, 6–8], and adolescents also seem to be at high risk [7–9]. Factors, such as a poor psychological condition [6], a low socio-economic status [1] and not having an established provider [10, 11] are associated with missing an appointment. On the other hand suffering from a chronic illness [12, 13] and living close to the healthcare centre [14] are associated with higher attendance. The few studies focusing on adolescents list some further factors: scheduling the first appointment for the adolescents by the parents [15], follow-up appointments (com-

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pared to first ones) [16] and consulting for "cosmetic problems" (compared to "non-cosmetic" ones) [17] are associated with less missed appointments. In the literature most reported results do not take cancellations into account. In fact, very few research papers report such data. One study in a family practice clinic showed a 6.9% cancellation rate [5], whilst one in a dermatology clinic indicated a 8.3% rate [18]. To our knowledge, there are no studies specifically analyzing cancellation rates among adolescent patients.

Our adolescent multidisciplinary health care unit exists since 1998 and attempts to meet the youth friendly health services criteria of the World Health Organisation [19]. From this point of view, the rates of non-attendance can be considered as an indicator, among others, of the quality of care. Indeed, intention to keep an appointment [20] and compliance in coming for appointments [21] are associated with satisfaction with health care. After a period of pilot testing, data on attended, missed and cancelled appointments in our unit have been registered in a computerized database since January 1999.

Using these data we aim: 1) to determine the prevalence of missed and cancelled appointments in our unit and the characteristics of these appointments. We hypothesize that we have lower rates of missed appointments than those reported in the literature due to the special attention given to the quality of care, and 2) As the administration of the university hospital decided that from January 1st, 2004 patients must pay for unexcused missed appointments, we wanted to determine whether such a measure has an impact on the rates of missed appointments. We found no previous study assessing the effects of such a policy. Finally, 3) to assess differences in missed appointment rates between staff and resident physicians. Our hypothesis is that staff physicians show lower rates than residents because they do not rotate and there is consequently a better continuity of care.

Methods

The "multidisciplinary unit for adolescent health" at the University Hospital in Lausanne, Switzerland, is an outpatient clinic. It possesses its own building, where adolescents aged 12–20 years can consult in a place specially adapted to their needs. The permanent staff is a multi-professional team composed of two senior adolescent physicians, a senior gynaecologist, one adolescent medicine chief resident, a psychologist, a nurse, a family planning counsellor and a dietician. Two physician residents (in paediatrics and gynaecology) rotate every six months, while the adolescent medicine resident rotates once a year. Taking advantage of the multidisciplinary approach, patients consulting in our clinic are mostly referred by other health professionals and social services in complex situations. The average time required to receive a first consultation is one to two weeks.

The official hospital policy is that an appointment should be considered as missed if not excused at least 24 hours in advance. However, in our unit we value the fact that an adolescent makes the effort to call. Therefore any cancellation made before the appointment (even if done at the last minute) is coded as a cancellation.

Data of all appointments from 1 January 1999 to 31 December 2006 were used. Each completed consultation includes the patient's (identification number, age, gender, address, diagnosis) and the characteristics of the consultation (date, hour, provider, first or follow-up, with parents present or not, reason for consulting, duration). However, if a patient misses the appointment only the patient's characteristics (without diagnosis), the date of consultation and the intended provider are recorded in the database.

From 1999 to 2006 a total of 35,465 consultations were registered. Of these consultations, 2649 were excluded because they had been provided as consultations to hospitalized patients (N = 794), they concerned patients outside the age range (12–20 years) of our unit (N = 989), too much data was missing (N = 63) or they were adjourned by the scheduled provider (N = 803). After these readjustments we worked with a database of 32,816 consultations (92.5% of all the appointments), which represent 3577 patients (82.4% females). All analyses have been conducted by appointments and not by patients.

In a first step, we calculated the rates of the three types of appointments (missed, cancelled and attended) by year, month, weekday and period (morning or afternoon). Subsequently, we ran two binomial logistic regressions, the first one for missed appointments and the second one for cancelled appointments. In both cases the reference category was attended appointments. Age, gender (reference category: males), year (reference category: 2004), month (reference category: November), weekday (reference category: Tuesday) and period of the day (reference category: afternoon) were used as covariates. Since we used appointment rather than patient, the observations corresponding to a single patient might be correlated, so generalized estimating equations (GEEs) were used to obtain robust estimations. To assess the effect of the policy to charge for missed appointments, we compared rates before and after 1 January 2004. Finally, to verify whether our residents' turnover had any impact on attendance, we compared missed and cancelled appointment rates between residents and staff physicians controlling for age and gender. For these analyses we have excluded the consultations provided by the paramedical staff and have only taken into account those provided by staff or resident physicians (n = 25,221 appointments).

All analyses were performed with SPSS 14 & 15 (SPSS Inc, Chicago, Illinois). Our data represent a very large fraction of the total of all consultations taking place in our clinic since 1999. However since the phenomenon of missed appointments is common to all health units specialized in adolescent health, we chose to consider our data as a sample and to perform significance analyses. Considering the large number of consultations, we chose a significance level of $p < .01$ for the analyses in order to avoid a type I error.

Results

From 1999 to 2006, our unit had an overall rate of 11.8% missed appointments and 10.9% cancelled appointments. Overall, females cancelled more than males (11.3% vs. 8.4%, AOR 1.31, 99% CI 1.08–1.59), but there was no difference for missed appointments (11.7% vs. 12.3%, AOR 0.88, 99% CI 0.71–1.08). By year, the rate of missed appointments increased to a peak of 13% in 2002, decreasing thereafter, whilst the cancellation rate more than doubled over the years, from 6.7% in 1999 to 14.9% in 2006. The rate of attended appointments decreased from 1999 (83.5%) to 2004 (74.2%), remaining stable thereafter. By month, the highest missed consultation rates (over 13%) corresponded to July, August and October, while the highest for cancellations was June and December. By weekday, Wednesday showed the highest rates of both missed and cancelled appointments. Finally, missed appointments predominated in the mornings while cancelled rates were slightly higher in the afternoons (table 1).

In the multivariate analysis, missed appointments increased with age, were higher in April and June to October, were higher on any weekday but Thursday and more frequent in the mornings. Females were significantly more likely to cancel appointments and the cancellation rate was significantly lower before 2004 (table 2).

Overall, the effect of the policy to charge for unexcused appointments showed no effect on the missed appointment rates (1999–2003: 11.9%; 2004–2006: 11.6%; AOR 0.96, 99% CI 0.83–1.10), but the cancellation rates increased significantly between 1999–2003 and 2004–2006 (8.4% vs 14.5%; AOR 1.83, 99% CI 1.63–2.05).

There were no significant differences regarding cancellations between staff physicians (10.3%) and resident physicians (11.3%). However missed appointments were slightly higher for residents (11.8% vs. 10.4%), remaining significant after controlling for age and gender (Adjusted Odds Ratio: 1.20; 99% CI: 1.08–1.33).

Table 1

Rates of each type of appointment by year, month, weekday and period of the day.

			Type of consultation		
			Missed	**Cancelled**	**Attended**
Year	1999	(n = 3007)	9.8%	6.7%	83.5%
	2000	(n = 3587)	11.7%	8.5%	79.8%
	2001	(n = 4044)	11.9%	7.6%	80.5%
	2002	(n = 4194)	13.0%	8.1%	78.9%
	2003	(n = 4431)	12.5%	10.4%	77.1%
	2004	(n = 4610)	11.7%	14.1%	74.2%
	2005	(n = 4440)	11.8%	14.6%	73.6%
	2006	(n = 4503)	11.2%	14.9%	73.9%
Month	January	(n = 2721)	11.2%	10.4%	78.4%
	February	(n = 2665)	11.2%	11.3%	77.6%
	March	(n = 3152)	10.8%	10.9%	78.3%
	April	(n = 2857)	11.8%	10.3%	77.9%
	May	(n = 3131)	11.1%	10.2%	78.8%
	June	(n = 2985)	12.7%	11.6%	75.7%
	July	(n = 2498)	13.6%	11.1%	75.3%
	August	(n = 1815)	13.9%	11.2%	74.8%
	September	(n = 2550)	12.2%	11.1%	76.8%
	October	(n = 2797)	13.0%	10.7%	76.3%
	November	(n = 3007)	9.6%	10.8%	79.6%
	December	(n = 2638)	11.5%	11.6%	76.9%
Weekday	Monday	(n = 6248)	12.1%	11.4%	76.5%
	Tuesday	(n = 5654)	9.8%	10.5%	79.7%
	Wednesday	(n = 8981)	12.5%	11.5%	76.0%
	Thursday	(n = 5820)	11.5%	11.4%	77.1%
	Friday	(n = 6113)	12.4%	9.4%	78.2%
Period of the day	Morning	(n = 8840)	13.6%	10.7%	75.7%
	Afternoon	(n = 23701)	11.2%	11.1%	77.7%

Discussion

We found a rate of 11.8% for missed appointments and 10.9% for cancellations. While few comparative rates are reported in the literature, our global rate of missed appointments is lower than the 20% found by Sawyer et al. [16], the 38% of Freed et al. [20] and the 18% and 48.5% that Irwin et al. reported respectively for first and for follow-up appointments [15, 22]. Our relatively low rate may be due to the fact that we have always tried to provide quality care and to meet the adolescent friendly health services guidelines [19]. Regarding cancellations, our results are slightly higher than those reported in the literature for the general population [5].

Age is a characteristic of the patient influencing missed appointments. This finding is in agreement with what has been reported in the literature. Young adults are more likely to miss consultations than adolescents [1, 7], and possibly parents of older patients are less implicated in their adolescents' visits, resulting in more missed appointments.

Interestingly, missed (but not cancelled) appointments are significantly more frequent at times coinciding with school vacation: April (Easter), June to September (summer), and October (when students in our canton have two weeks of autumn vacation). This finding could be explained by the fact that adolescent patients prefer to be on vacation than visiting a health provider and that during vacation it is easier to forget a scheduled appointment.

The high rates of missed appointments during the morning period can be related to the appointment interfering with school. In our canton, afternoons contain mainly lessons that count less in grading marks (physical education, music,), which adolescents perhaps allow themselves to miss more readily. These observations match those of Irwin et al. [22], who found "interference with school" as the second cause of missed appointments by adolescents after "forgetting the appointment". Likewise in a study with adolescents consulting in a dental clinic, the most frequent reported reasons for missing were "illness" and "occupied in school" [23]. While we have no hypothesis to explain the differences found between weekdays for missed appointment rates, it is interesting that another Swiss study also reported Tuesday as having lower rates of missed appointments [8], although according to their results the difference is not significant.

While the implementation of the policy of charging for non-cancelled appointments showed no difference in rates of missed appointments before and after its introduction, it is also worth noting that missed appointment rates have remained stable while cancellation rates have increased. We could assume that this is an effect of the new policy on missed appointments. Although the policy is applied in our unit quite laxly with any cancellation before the appointment being accepted, the fact that it is probably not the adolescents themselves who have to pay for it could, at least in part, explain why missed appointments have not decreased. However, it is of interest that cancellations have increased at the expense of missed appointments, because the former allows rescheduling the appointment and the continuity of care can be assured. Moreover we can also note that the rate of attended appointments, which was decreasing, has stabilized since 2004.

In our results, there was only a slight difference between staff and resident physicians for missed appointments. For adults, the period following the turnover and the breach of the relationship was not associated with an increase in missed appointments [24, 25]. Nonetheless having an established provider was associated with fewer missed appointments [26]. Our residents

Table 2

Logistic regressions (n = 32541) for missed and cancelled appointments (reference category: attended appointment) with age, sex, weekday, month, year and period of day as covariates.

	Missed appointment	Cancelled appointment
	AOR* (99% C.I.)	**AOR* (99% C.I.)**
Age	**1.05 (1.01–1.09)**	1.01 (0.98–1.04)
Females	0.88 (0.71–1.08)	**1.31 (1.08–1.59)**
Males	1	1
Monday	**1.20 (1.00–1.44)**	1.07 (0.91–1.26)
Tuesday	1	1
Wednesday	**1.35 (1.15–1.60)**	1.08 (0.93–1.25)
Thursday	1.13 (0.94–1.35)	1.05 (0.89–1.23)
Friday	**1.20 (1.00–1.44)**	0.95 (0.80–1.13)
January	1.19 (0.95–1.49)	0.97 (0.77–1.23)
February	1.20 (0.96–1.51)	1.08 (0.86–1.35)
March	1.14 (0.91–1.43)	1.03 (0.82–1.28)
April	**1.28 (1.03–1.59)**	0.97 (0.77–1.21)
May	1.19 (0.95–1.49)	0.96 (0.77–1.20)
June	**1.40 (1.13–1.74)**	1.08 (0.87–1.35)
July	**1.48 (1.17–1.86)**	1.07 (0.84–1.35)
August	**1.54 (1.20–1.97)**	1.03 (0.79–1.34)
September	**1.32 (1.05–1.65)**	1.03 (0.82–1.30)
October	**1.43 (1.15–1.77)**	1.02 (0.81–1.28)
November	1	1
December	1.24 (1.00–1.56)	1.10 (0.88–1.37)
1999	0.82 (0.64–1.05)	**0.45 (0.35–0.58)**
2000	1.00 (0.79–1.28)	**0.58 (0.46–0.72)**
2001	1.00 (0.80–1.26)	**0.50 (0.41–0.63)**
2002	1.11 (0.90–1.38)	**0.54 (0.44–0.67)**
2003	1.07 (0.88–1.30)	**0.71 (0.59–0.85)**
2004	1	1
2005	1.00 (0.81–1.22)	1.03 (0.86–1.24)
2006	0.91 (0.73–1.14)	1.06 (0.89–1.26)
Morning	**1.25 (1.11–1.40)**	0.91 (0.81–1.03)
Afternoon	1	1

In bold p <.01
* AOR: adjusted odds ratio

only change once or twice a year and adolescents have an established provider during the whole rotation. This change seems to have only a small effect on adolescents' attendance, possibly due to the fact that our patients are able to build a good relationship with their provider. Moreover, different strategies have also been used to ensure the best possible transition. At the end of their rotation residents discuss the issue with their patients and special attention is given to the transfer of information concerning the patients to the next resident. Additionally, at the end of the resident's rotation, staff physicians take care of difficult patients. Nevertheless, the greater experience of the staff physicians in managing patient-provider relationships with adolescents could also play a role.

The main strength of our research is that it is based on a large number of exclusively adolescent consultations during a period of eight years and that it has allowed us to test the effect of a policy aimed at reducing missed appointments that, to our knowledge, had never been tested before. Furthermore, we describe for the first time the cancellation rate in an adolescent population.

Several conclusions that could help prevent missed appointments can be drawn from this study. Firstly, practitioners dealing with adolescents should be aware of the fact that clinic hours should be scheduled after school, and that, when giving an appointment during school vacation, they should make the patient aware of it. Secondly, older adolescents should be more closely monitored as they are more likely to miss appointments. Thirdly, charging for non-excused appointments has an effect on the cancellation rate. Even though a cancellation (especially at the last minute) is often as negative as a missed appointment, it has the advantage of permitting rescheduling of the appointment. In adolescent patients, assuring continuity of care is worthwhile. Finally, when properly done, discontinuing the patient-provider relationship has only a slight effect on missing appointments, which probably depends on factors other than the change of provider.

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