Missed Appointment in Adolescent Clinic; Perspective from Tertiary Care Hospital, Thailand

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Objective: *To determine the missed appointment rate and evaluate the factors related to appointment adherence in adolescent patients, based on the patients' characters and services provided.*
Material and Method: *All medical records in adolescent clinic at Siriraj Hospital between 2004 and 2009 were reviewed. Patients that visited the clinic at least twice with the follow-up visit order were recruited. Data analyses were performed by Chi-square test and Fisher's exact test wherever appropriated.*
Results: *One hundred twenty six patients met the inclusion criteria. Patients' mean age were 14.3-year-old (SD = 2.7) and the majority (95%) were students. Seventy one point five percent of principle diagnosis related to behavioral problems while 90% had at least one risky behavior detected. Comparing between missed and non-missed appointment, only the acute illness and the history of appointment cancellation were significant different characters between groups ($p<0.001$). Of 429 visits, 409 (95.3%) got telephone reminder a few days prior the appointment date, 48 (11.2%) remained non-complying and 40 (9.7%) had rescheduled. Only 18 (4.2%) of the visits were the patients themselves made re-appointments, which all complied with the new visit. Having rescheduled after being reminded and having history of a missed previous appointment were the most significant predictors for next appointment adherence ($p = 0.01$ and $p = 0.02$ respectively).*
Conclusion: *In adolescents, appointment non-compliance is a challenging issue for clinicians. Predicting factors found in this study might help foster appointment adherence. Interestingly, services provided such as telephone reminder, short waiting time, appointment time did not influence adherence in this population.*

Keywords: *Outpatient, Missed appointments, Adolescents, Appointment adherence, Appointment, Compliance*

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Adolescence is a stage where physical, pubertal, cognitive, and emotional changes developed before getting into adulthood. The hallmarks of each stage of adolescents are classic. However, one of the biggest problems in this population is risk-taking behaviors such as sexual risks, teenage pregnancies, substance abuse, violence, etc. In Thailand, the etiologies of highest hospitalization rate in adolescents aged 13 to 18 years old were birth delivery (29%) and injuries or poisoning (19%)[1]. To prevent recurrence, continuity of care should be provided. However, one of the barriers when providing care to this population is appointment non-compliance. This issue is a concern worldwide, particularly in adolescents and young adult[2,3], resulting in health and economic consequences[4,5]. In general, 17% of the patients were reported to have defaulted while 11.8% of the scheduled appointments for adolescent patients were missed[6]. Most of non-attendance adolescents had more health-risks of negative consequences[7,8]. Many efforts to promote appointment adherence were suggested. The systematic review showed that the use of telephone and SMS as manual and automated reminders could effect non-attendance rates especially a professional call. However, cost effectiveness did not meet the standard guidelines for economic evaluation in all studies[9]. In addition, cancellations and rescheduling the appointment prior to follow-up date were a risk of subsequent missed appointment. However, behaviors of cancelling between forgetting an appointment and postponing date in advance could not be distinguished[6]. School hours and vacation period were other factors for missed appointment rates[10]. Therefore, missed health appointment in adolescent population is variable for each sites, but the importance of giving the care to them is crucial as a health care provider. The authors evaluated the

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influence of those risk factors to improve attendance rate in this risky population.

Siriraj Hospital, the largest tertiary medical center in Thailand, provides exemplary medical services with interdisciplinary, comprehensive, and multidisciplinary care. Adolescent clinic is one of the multidisciplinary and continuity of care clinic, established in 2004. It has been designed to provide services for teenagers aged 10 to 21-years-old. This clinic is dedicated to serve the health-care needs of adolescents and promote their health, and provides clinical teaching to medical students, pediatric residents, and other interdisciplinary trainees. As a multidisciplinary team, professionals running the clinic are composed of two Adolescent Medicine physicians, a nurse practitioner, a clinical-psychology social worker, a health educator, and other subspecialty consultants. All adolescents and their parents are informed about the patient confidentiality; behavioral risk assessment, health screening, and health guidance are provided. While the numbers of patients have been rising, the amounts of non-compliances are unavoidably increasing as well. Many reasons for non-complying with appointment were discussed. Initially, most of the excuses were forgetting the appointment. Therefore, telephone reminder a few days prior to appointment was proposed.

The present study were aimed to review the outcome of telephone reminder and to assess the factors related to appointment adherence in adolescent patients, based on the patients' characters and services provided in adolescent clinic, Siriraj Hospital.

Material and Method

Medical records of patients followed-up at adolescent clinic between 2004 and 2009 were reviewed. There were 146 patients with 514 appointments. From the sample size calculation, with a miss appointment rate of 20%, the author needed a sample size of at least 126 patients. Patients that attended at least twice attended the clinic with a follow-up-visit order were recruited. Patients were categorized into two groups 1) missing appointment group (MA); defined as having missed the appointment at least once 2) non-missing appointment group (non-MA); defined as the group that never missed any appointment and included the patients who called in advance either to reschedule or cancel their appointments to this group as well. The characteristics of the two groups of the patients were compared. Missed appointment rate and factors related to missing appointment were analyzed. SPSS 18.0 (SPSS Inc., Chicago, IL) was used for statistical analyses. Chi-square test and Fisher's exact test were performed, where appropriated. A p-value of <0.05 was considered as statistically significant.

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Results

Baseline demographic features of the patients

Table 1 showed the demographic data. Of 146 patients, 126 patients met the inclusion criteria with 429 visits. The majorities of patients were student (94.4%) and lived with their parents (94.6%). Female and male ratio was 1.5:1. Patients' mean age

Table 1. Baseline demographic data of the patients

Data	Total (n = 126), n (%)
Ages (years), means ± SD	14.3±2.7
Gender	
Male	45 (35.7)
Female	81 (64.3)
Social status	
Student	119 (94.4)
Employee	5 (4.0)
Status not reported	2 (1.6)
Type of diagnosis	
Behavior problems	23 (18.3)
Medical problems	36 (28.6)
Combined	67 (53.2)
Risk behaviors	
No risk	13 (10.3)
1-3 risks	99 (78.6)
>3 risks	14 (11.1)
Sexually active	
Yes	23 (18.3)
No	103 (81.7)
Primary care giver	
Mother	59 (46.8)
Father	2 (1.6)
Both	58 (46.0)
Family members	7 (5.6)
Parental status	
Married	102 (81.0)
Separated	7 (5.6)
Divorced	9 (7.1)
Parental death	8 (6.3)
Sources of the patient referral	
In-hospital	83 (65.9)
Schools	43 (34.1)

was 14.3-years-old (SD 2.7). Almost three quarters of principle diagnosis (71%) related to behavioral problems while 90% had at least one risky behavior. One-fifth (18.3%) reported being sexually active. Two thirds were referred from other in-hospital services, the rest were from schools. A third (33.3%) had missed appointment at least once.

Characteristics differences between two patient groups: missing appointment (MA) vs. non-missing appointment (non-MA) groups

Sixty-six point seven percent of the patients had never missed the appointment. Comparing between MA and non-MA groups in Table 2, only the history of having an acute illness and numbers of the previous history of appointment cancellation were statistically significant different factors between groups ($p<0.001$), while type of diagnosis, academic status, and number of behavioral risks were less significant ($p = 0.039$, 0.04 and 0.045 respectively). Other studied characters did not show any significant differences.

Factors related to the appointment-complying to the upcoming visit

Table 3 showed the characteristic of each visit that the patients received by the clinic. Of the 429 visits, 409 (95.3%) received telephone reminder a few days prior those appointment date, 48 (11.2%) remained

Table 2. Comparing characteristics between missed appointment (MA) and non-missed appointment (non-MA) groups

Characteristics	No. of patients (%)		p-value
	Non-MA group (n = 84), n (%)	MA group (n = 42), n (%)	
Gender			0.16
Male	34 (40.5)	11 (26.2)	
Female	50 (59.5)	31 (73.8)	
Having acute medical illness			<0.001
Yes	22 (26.2)	25 (59.5)	
No	62 (73.8)	17 (40.5)	
Type of diagnosis			0.039
Behavior problems only	17 (20.2)	6 (14.3)	
Medical problems only	29 (34.5)	7 (16.7)	
Combined problems	38 (45.2)	29 (69.0)	
Social status			0.04
Student	77 (91.7)	42 (100)	
Non-student	7 (8.3)	0 (0)	
Risk behaviors			0.045
No risk	12 (14.3)	1 (2.4)	
1-3 risks	61 (72.6)	38 (90.5)	
>3 risks	11 (13.1)	3 (7.1)	
Sexually active			0.09
Yes	19 (22.6)	4 (9.5)	
No	65 (77.4)	38 (90.5)	
Sources of the patients referral			0.89
In-hospital	55 (65.5)	28 (66.7)	
Schools	29 (34.5)	14 (33.3)	
Rescheduled by the patient themselves			0.60
Yes	2 (2.4)	2 (4.8)	
No	83 (97.6)	40 (95.2)	
Rescheduling after being called			0.33
Yes	9 (10.6)	7 (16.7)	
No	76 (89.4)	35 (83.3)	
Amount of previous appointment cancellation			<0.001
0-1	62 (91.2)	16 (57.1)	
≥2	6 (8.8)	12 (42.9)	

Table 3. Factors related to upcoming appointment compliance

Factors	No. of visits (n = 429)		p-value
	Non-missing visit (n = 381), n (%)	Missing visit (n = 48), n (%)	
Being rescheduled by the patient			0.24
Yes	18 (4.7)	0 (0)	
No	363 (95.3)	48 (100)	
Having call reminder			0.15
Yes	361 (94.8)	48 (100)	
No	20 (5.2)	0 (0)	
Rescheduling after call reminder			0.01
Yes	40 (10.5)	0 (0)	
No	341 (89.5)	48 (100)	
Having missed a previous appointments			0.02
Yes	6 (1.6)	4 (8.3)	
No	375 (98.4)	44 (91.7)	
Interval between previous and current appointment			0.87
0-3 months	233 (61.8)	30 (62.5)	
4-6 months	95 (25.2)	13 (27.1)	
≥6 month	49 (13.0)	5 (10.4)	
Having accompanying person			0.30
Yes	317 (91.9)	11 (84.6)	
No	28 (8.1)	2 (15.4)	
Total waiting time before seeing the physician			0.50
<1 hour	326 (95.0)	12 (92.3)	
≥1 hour	17 (5.0)	1 (7.7)	
Appointment time			0.70
1-2 pm	333 (96.2)	13 (100)	
2-3 pm	13 (3.8)	0 (0)	

non-complying and 40 (9.7%) rescheduled. Only 18 (4.2%) of the visits where the patients made re-appointments themselves, which all were complied with the new visit. Having rescheduled after being reminded and having history of missed previous appointments were the most significant factors to predict the compliance of the upcoming appointment ($p = 0.01$ and $p = 0.02$ respectively). Interestingly, other services provided such as call reminder, frequency of each appointment, duration of waiting time before seeing the physician, and time scheduling did not show any impact to appointment compliance. Other interesting factors such as number of previous visit cancellation, having someone accompanying the patient, and rescheduling the visit by themselves did not influence to the visit adherence.

Discussion

Similar to some studies[10], the missed appointment rate in the presented study was 11.2% while other study showed much more[6]. The authors also highlighted the characteristics of the patients who had never missed an appointment or who complied with their appointments. Such significant characters, from the highest to lowest significance, were history of acute medical illness a few day prior to the appointment date, number of previous appointment cancellation, type of diagnosis, being a student, and number of risky behaviors. To foster appointment adherence in this population, telephone reminder, interval of each appointment, appointment time, and short duration of waiting time were the proposed suggestions. However, the authors found that none of our services provided could facilitate the patients' compliance. In the present study, the authors found that predicting factors for appointment compliance for each visit were 1) when calling to remind prior, the patients did reschedule for the new appointment, and 2) history of missed the latest appointment ($p = 0.01$ and 0.02 respectively). From this present study, appointment

time at two pm might not be the right time for the patients, who mostly were students. Still, there was a limitation on hospital system that closed at four pm except for emergency department and special clinic, which needed extra services charges. Many studies found the predictor for missed appointment were low socioeconomic status, psychological condition, having an acute illness, cancellation of previous appointment, and long distance from the hospital. Such factors did not show any statistically difference in the present study[2,11,12]. Reminding call was the efficient methods to increase attendance rate in the previous study[9], which is in contrast to the present study. All missing visits had telephone reminder a few day prior to those visits (n = 48, 100%). Patients that rescheduled did not affect the numbers. Even this behavior should be the presenting of self-responsibility of their health. Similar to the present study, Chariatte et al found that the most important influential risk of appointment missing was having missed at least one previous appointment[6]. In the light of waiting time, even though it did not show any influence for the appointment adherence in the presented study, it would be a possible excuse for the next appointment cancellation. Conversely, the interval between previous and current appointment did not prove the hypothesis in the present study. More innovative strategies to promote the adherence for the continuity of care in adolescent population should be considered. Peer-review journal suggested that using text messaging could help promoting the productivity and proficiency, conciliation access, and being the most cost-effective for health care to reduce outpatient non-attendance[13]. However, the limitation of this intervention in our population was the frequent changing of the cell phone numbers. As health care providers, we realize how important is the continuity of cares in such population. The authors have been trying other ways to connect with the patients. Facebook, Twitter, or other IT systems might be other options for providing general care and education combined with the past intervention.

Limitation

This preliminary study is limited by its retrospective design resulting in a lack of other possible factors that might be key for improving the appointment-compliance in this population. However, the number of patients and the amount of visits did not affect the outcome of the present study. For next study, the authors suggest to include more information such as who brought the patients to the follow-up and the real cause of missing the appointment. It should be determined on the day of absence by performing a prospective cohort study.

Conclusion

In adolescent population, appointment non-compliance is unavoidable, but minimizing the missed appointment rate is the challenging issue. Being rescheduled after call reminder and having history of latest appointment missing were the strongest predictor of the appointment non-adherence for the upcoming visit. Other services including telephone-reminders, short duration of waiting time, frequency of appointment, and appointment time did not show any influences for the appointment compliance.

What is already known on this topic?

Appointment non-adherence is one of the health and economics issues worldwide. Many studies[6,9,10] showed that some methods such as text messaging, reminding call, short duration of waiting time, etc., could promote appointment adherence rate, however, most of the studies were done in the west and the results were variable depending on sites. As a health care provider, evaluating the influential risk of missed appointment in risky adolescents population is crucial to improve the attendance rate especially in Thailand where adolescent behavioral problems have dramatically increased.

What this study adds?

The present study emphasized that the missing appointment rate remained at about 10% of the appointments. Reminder call a few days before the appointment date did not help appointment adherence. In addition, short duration of waiting time, interval between each visit, or appointment time did not demonstrate to foster appointment adherence in this population. However, this study demonstrated the predictors for missing the upcoming appointment in the adolescent patients. They were the patients' histories of previous missed appointment and having rescheduled after call-reminder.

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Potential conflicts of interest

None.

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การผิดนัดคลินิกวัยรุ่น: ข้อมูลจากโรงพยาบาลระดับตติยภูมิประเทศไทย

ธัญลักษณ์ อินทโชติ, ธิดารัตน์ ชูวงศ์, สุภิญญา อินอิว, เจษฎา สุวรรณวารี, บุญยิ่ง มานะบริบูรณ์

วัตถุประสงค์: *ศึกษาอัตราการผิดนัดของคลินิกวัยรุ่นและปัจจัยที่เอื้อต่อการมาตามนัดของผู้ป่วยวัยรุ่นโดยดูจากลักษณะของผู้ป่วยและการบริการที่ให้*

วัสดุและวิธีการ: *ทบทวนเวชระเบียนผู้ป่วยวัยรุ่นระหว่างปี พ.ศ. 2547-2551 ที่มาตรวจที่คลินิกวัยรุ่น โรงพยาบาลศิริราช อย่างน้อย 2 ครั้ง และมีนัดครั้งต่อไป และนำข้อมูลที่ได้นำมาวิเคราะห์ทางสถิติด้วยวิธี Chi-square test, Fisher's exact test, Mann-Whitney U test, และ one-way ANOVA*

ผลการศึกษา: *วัยรุ่นที่เข้าเกณฑ์การศึกษา จำนวน 126 ราย มีอายุเฉลี่ย 14.3 (SD 2.7) ปี ส่วนใหญ่ร้อยละ 95 กำลังเรียน ร้อยละ 71.5 ได้รับการวินิจฉัยโรคที่เกี่ยวข้องกับปัญหาพฤติกรรม และร้อยละ 90 พบมีพฤติกรรมเสี่ยงอย่างน้อย 1 อย่าง เมื่อเปรียบเทียบระหว่างกลุ่มที่ผิดนัดและกลุ่มที่ไม่ผิดนัด พบว่าความเจ็บป่วยเฉียบพลันและประวัติการยกเลิกนัดครั้งก่อน ๆ เป็นปัจจัยที่แตกต่างกันอย่างมีนัยสำคัญทางสถิติ ($p<0.001$) ระหว่าง 2 กลุ่ม ในจำนวนทั้งหมด 429 ครั้งของการมาคลินิก พบว่า 409 ครั้ง (ร้อยละ 95.3) ได้รับการโทรศัพท์เตือนให้มาโรงพยาบาลล่วงหน้า 2-3 วัน มี 48 ครั้ง (ร้อยละ 11.2) ที่ผู้ป่วยยังคงผิดนัด และ 40 ครั้ง (ร้อยละ 9.7) ที่ขอนัดใหม่มีเพียง 18 ครั้ง (ร้อยละ 4.2) เท่านั้นที่ผู้ป่วยโทรมาขอเปลี่ยนวันนัดใหม่เองซึ่งผู้ป่วยกลุ่มหลังนี้มาตามที่นัดใหม่ทุกราย พบว่าการที่ผู้ป่วยขอนัดใหม่หลังจากที่ได้รับโทรศัพท์เตือนและประวัติการผิดนัดก่อนหน้านี้เป็นปัจจัยทำนายการผิดนัดครั้งต่อไปของผู้ป่วยอย่างมีนัยสำคัญทางสถิติ ($p = 0.01$ และ $p = 0.02$ ตามลำดับ)*

สรุป: *การผิดนัดของผู้ป่วยวัยรุ่นเป็นปัญหาที่ท้าทายของแพทย์ การทราบปัจจัยทำนายการผิดนัดของผู้ป่วยวัยรุ่นอาจเป็นข้อมูลในการปรับปรุงคุณภาพงานบริการเพื่อให้ผู้ป่วยมาตามนัดการบริการ เช่น โทรศัพท์เตือน ลดเวลาการรอแพทย์ตรวจ และเวลาที่นัดไม่มีผลต่อการมาตามนัดของผู้ป่วยวัยรุ่น*