

Patients' Attitudes Toward the Practice of Fourth-Year Medical Students in Longitudinal Ambulatory Experience I Course

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Abstract

Background: Patient involvement is fundamental to undergraduate medical education, particularly in ambulatory care settings. Understanding patients' attitudes toward medical student participation is essential for maintaining patient-centered care.

Objectives: To assess patients' attitudes toward fourth-year medical students' practice in the Longitudinal Ambulatory Experience I course and to identify factors associated with these attitudes.

Methods: A cross-sectional survey was conducted using self-administered paper-based questionnaires among 144 patients and relatives/guardians attending 3 outpatient clinics at Ramathibodi Chakri Naruebodindra Hospital, Thailand, in March 2025. Descriptive statistics and Spearman rank correlation were used. Subgroup comparisons across participant characteristics were performed using the Mann-Whitney *U* test and Kruskal-Wallis test.

Results: Patients reported high levels of positive attitudes. The highest-rated aspects were understanding the educational role of medical students, respectful behavior, appropriate attire, and effective communication. The attitude questionnaire demonstrated excellent internal consistency (Cronbach $\alpha = 0.941$). No significant associations were found between attitude scores and age, education level, or monthly income. Similarly, no significant differences were observed in subgroup analyses based on other participant characteristics, including gender, religion, payment method, previous hospital visit experience, previous experience with medical students, and clinic type (all $P > .05$).

Conclusions: Patients and relatives/guardians generally had positive attitudes toward medical student involvement in ambulatory education. Supervised participation of medical students in outpatient care appears acceptable to patients and supports the continuation of patient-centered clinical teaching.

Keywords: Medical students, Patient attitudes, Outpatient care, Ambulatory care, Clinical practice, Education

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Introduction

Clinical practice is an essential component of undergraduate medical education, providing students with opportunities to apply theoretical knowledge in authentic healthcare environments. Direct patient interactions are critical for developing core clinical competencies, including history taking, physical examination, clinical reasoning,

communication skills, and professionalism. Such experiences not only facilitate the acquisition of clinical skills but also promote patient-centered care and the development of effective doctor-patient relationships. Exposure to diverse clinical presentations further enhances students' confidence and preparedness for future independent practice.

Previous studies have consistently demonstrated high levels of patient acceptance of medical student involvement in clinical care. Taha et al¹ reported that most outpatients were willing to allow medical students to participate in history taking and physical examinations, particularly when supervised by attending physicians, promoting patient confidence and trust. Similarly, Cooke et al² found that only a small proportion of patients expressed negative attitudes toward medical student participation, whereas many recognized its educational value and perceived potential benefits to their own healthcare experience. These findings suggest that patients generally appreciate their role in supporting the education of future physicians and are willing to participate in clinical teaching when patient safety and quality of care are appropriately maintained. In contrast, a study conducted at the Johns Hopkins Outpatient Center found that 40% of patients who were seen by both attending physicians and medical students perceived that medical student involvement probably or definitely did not improve their care, and 30% preferred not to have medical students participate in future outpatient visits.³ Patients' perceptions are therefore an important consideration in clinical education, as they may influence the acceptability and sustainability of patient-based teaching. Understanding patients' experiences and attitudes toward medical student involvement can provide valuable insights for improving clinical teaching practices, enhancing patient-student interactions, and maintaining high-quality, patient-centered care while supporting educational outcomes.

At the Faculty of Medicine Ramathibodi Hospital, Mahidol University, fourth-year medical students, who are in the first year of the 3-year clinical curriculum, participate in the Longitudinal Ambulatory Experience I course. This course aims to facilitate the development of core clinical competencies through supervised ambulatory care experiences, including the assessment and management of common health problems, holistic clinical reasoning, continuity of care in primary care settings, patient-centered communication, health education, and reflective practice.

Clinical training is conducted at Ramathibodi Chakri Naruebodindra Hospital, Samut Prakan, Thailand, where students participate in supervised outpatient clinics approximately 9 sessions per academic year, with each session lasting 3 hours. Students rotate through the pediatric, noncommunicable disease, and family medicine clinics. During family medicine sessions, teaching is provided by faculty from family medicine and several other specialties, enabling students to gain exposure to a broad range of common clinical conditions encountered in ambulatory practice.

Before each consultation, patients are routinely informed by clinic nurses about the educational role of medical students and invited to provide consent for student participation in their clinical care. Under faculty supervision, medical students independently obtain medical histories, perform physical examinations, and formulate preliminary clinical assessments and management plans before presenting each case to the supervising attending physician for discussion and feedback. Each student typically participates in the care of one to 2 patients during each outpatient session. When clinically appropriate and with the patient's consent, students may continue to follow the same patient during subsequent outpatient visits, thereby facilitating continuity of care and supporting longitudinal clinical learning.

The Longitudinal Ambulatory Experience I course is delivered by physicians from multiple disciplines who supervise fourth-year medical students in outpatient clinics. This multidisciplinary ambulatory learning environment provides students with opportunities to develop clinical competencies through exposure to a broad spectrum of patient presentations and healthcare needs. Despite the increasing emphasis on ambulatory medical education, evidence regarding patients' attitudes toward medical student involvement in outpatient settings remains limited in Thailand, particularly in newly established teaching hospitals. Furthermore, factors associated with patients' attitudes toward medical student participation in longitudinal ambulatory education have not been well characterized. Understanding patients' attitudes is important for informing the design of patient-centered clinical teaching and supporting the sustainable implementation of longitudinal ambulatory education programs. Therefore, this study aimed to assess patients' attitudes toward fourth-year medical students participating in the Longitudinal Ambulatory Experience I course and to identify factors associated with these attitudes. The findings may inform curriculum development, clinical supervision, and the design of patient-centered ambulatory learning experiences.

Methods

Study Design and Study Population

A cross-sectional survey was conducted using self-administered, paper-based questionnaires among patients attending noncommunicable disease clinic and family medicine clinic, and relatives/guardians attending pediatric clinic, at Ramathibodi Chakri Naruebodindra Hospital, Samut Prakan province during March 2025. The participants were selected based on convenience sampling. A total of 144 respondents, comprising patients and relatives/guardians, completed the questionnaire. Participants were adults, who would read and answer the questionnaire in Thai and receiving services at the 3 clinics. Those who do not consent will be excluded.

Sample size was calculated using Cochran formula for estimating a population proportion, assuming that 90% of patients at Ramathibodi Hospital agree to medical student involvement in their care,⁴ with a 95% confidence interval and a margin of error of 5%. The required sample size was calculated to be 139 participants, a larger number than this is acceptable. Cochran formula is the following formula: $n = (Z^2 p[1-p])/e^2$, where n is the population size, Z is the z score, p is the population proportion, and e is the margin of error.

Research Instrument and Data Collection

The questionnaire was designed appropriate items, including 3 sections (35 items). The first section comprised 10 items assessing the respondents' demographic and personal background characteristics. The second section consisted of 8 items evaluating patients' perceptions of the roles of medical students and attending physicians during clinical encounters in the course. The third section included 17 items using a 5-point Likert scale assessing patients' attitudes toward the clinical practice of medical students in the course (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). The questionnaire concept based on course objectives as competencies in managing common and diverse health problems, clinical skills, communicating effectively with patients and their families, delivering patient education and counseling, which patient perceived. The questions were derived from a review of relevant literatures;⁵⁻⁷ the new questionnaire was created and then experts helped to validate the questions.

Content validity of the questionnaire was evaluated using the index of item-objective congruence (IOC) by 3 experts in the field. The score of each item which more than 0.5 was acceptable. The expert panel consisted of 3 medical teachers in Faculty of Medicine Ramathibodi Hospital, Mahidol University. The questionnaire was tested through a pilot study before being implemented in practice.

Reliability testing was subsequently conducted using Cronbach α coefficient. A value greater than 0.70 was considered indicative of acceptable internal consistency.

The reliability of the second section of the questionnaire, which assessed the roles of medical students and attending physicians in the Longitudinal Ambulatory Experience I course, was acceptable, with a Cronbach α of 0.731.

The reliability of the third section of the questionnaire, which assessed patients' attitudes toward the performance of medical students, was very high, with a Cronbach α of 0.941.

After providing informed consent, eligible patients in the noncommunicable disease clinic and family medicine clinic, and relatives/guardians of pediatric patients, were invited by research assistants to complete an anonymous self-administered questionnaire in the waiting area after their consultation. Participation was voluntary, and neither the medical students nor the attending physicians were aware of participants' decisions to participate. These procedures were implemented to minimize social desirability bias.

Statistical Analysis

Data were analyzed using SPSS, version 30.0 (IBM Corp). Descriptive statistics were used to summarize participant characteristics and questionnaire responses. Continuous variables were reported as mean (SD) or median (IQR), whereas categorical variables were presented as frequencies and percentages. Spearman rank correlation was used to examine the correlation between participant characteristics (age, level of education, and monthly income) and the mean score of patients' attitudes toward the performance of medical students in the Longitudinal Ambulatory Experience I course, with a significance threshold of $P < .05$. Subgroup comparisons were analyzed using the Mann-Whitney U test for 2 groups of variables and the Kruskal-Wallis test for more than 2 groups of variables with a significance threshold of $P < .05$.

Results

A total of respondents was 144, the participant demographic characteristics were determined. Most respondents (65.3%) were patients, while 50 respondents (34.7%) were relatives/guardians. The mean (SD) age was 48.6 (14.9) years. Female respondents constituted the majority of the sample (67.4%). The most common educational attainment was a bachelor's degree (43.1%).

Most respondents resided in Samut Prakan province (79.9%), where the hospital is located, followed by Bangkok (7.6%). The vast majority of respondents reported Buddhism as their religion (98.6%). Most respondents were not first-time visitors to the hospital (81.9%), while 91 respondents (63.2%) reported that this was their first encounter with medical students (Table 1).

Analysis of respondents' perceptions regarding the roles of medical students and attending physicians revealed that most participants perceived medical students as having involvement across multiple stages of patient care. Nearly all respondents (99.3%)

reported that medical students participated in history-taking, and 95.8% indicated physical examinations. Concerning the role of attending physicians, 87.5% of respondents reported that attending physicians were involved from the initiation of the treatment process, and 85.4% indicated that attending physicians played a significant role in treatment planning (Table 2).

Table 1. Participant Demographic Characteristics

Characteristic	No (%)
Participant	
Patients	94 (65.3)
Relatives/guardians	50 (34.7)
Gender	
Men	47 (32.6)
Women	97 (67.4)
Age, y	
15-25	4 (2.8)
26-35	29 (20.1)
36-45	33 (22.9)
46-55	27 (18.8)
56-65	32 (22.2)
> 65	19 (13.2)
Level of education	
No formal education	2 (1.4)
Less than bachelor's degree	72 (50)
Bachelor's degree	62 (43.1)
Higher than bachelor's degree	8 (5.6)
Province of residence	
Bangkok	11 (7.6)
Samut Prakan	115 (79.9)
Others	18 (12.5)
Religion	
Buddhism	142 (98.6)
Others	2 (1.4)
Average monthly income, ฿	
No income	23 (16.0)
< 15 000	21 (14.6)
15 000-30 000	60 (41.7)
30 000-60 000	33 (22.9)
> 60 000	7 (4.9)
Method of payment for medical expenses	
Self-pay (nonreimbursable)	65 (45.1)
Civil servant medical benefit scheme	52 (36.1)
Universal health coverage scheme	9 (6.3)
Others	18 (12.5)

Table 1. Participant Demographic Characteristics (Continued)

Characteristic	No (%)
Patient's first visit to the hospital	
Yes	26 (18.1)
No	118 (81.9)
Patient's first encounter with medical students	
Yes	91 (63.2)
No	53 (36.8)
Outpatient clinic attended	
Pediatric clinic	38 (26.4)
Noncommunicable disease clinic	23 (16.0)
Family medicine clinic	83 (57.6)

Table 2. Perceptions of Roles of Medical Students and Attending Physicians

Role	No (%)	
	Yes	No
Medical students conducted patient history taking	143 (99.3)	1 (0.7)
Medical students performed physical examinations	138 (95.8)	6 (4.2)
Medical students ordered additional laboratory investigations	96 (66.7)	48 (33.3)
Medical students provided diagnoses, informed patients of investigation results, and explained the disease	103 (71.5)	41 (28.5)
Medical students explained treatment plans and prescribed medications	109 (75.7)	35 (24.3)
Medical students provided advice on post-discharge care and indications for follow-up visits	109 (75.7)	35 (24.3)
Attending physicians were involved in patient care from the beginning of the visit	126 (87.5)	18 (12.5)
Attending physicians were involved in more than half of the patient care process	123 (85.4)	21 (14.6)

Overall attitudes toward the performance of medical students were rated. The mean scores for overall was 4.52 out of 5.00.

The highest-rated item was patients' understanding that medical students need to learn directly from patients (mean [SD], 4.80 [0.50]), followed by the perception that medical students treated patients with respect (mean [SD], 4.77 [0.44]) and dressed appropriately and professionally (mean [SD], 4.72 [0.47]).

The lowest mean scores, were concerning about potential mistakes made by medical students (mean [SD], 4.13 [0.83]) and the perception that medical students did not delay medical care (mean [SD], 4.14 [0.89]) (Table 3).

When stratified by clinic type — pediatric outpatient clinic, noncommunicable disease clinic, and family medicine clinic — patients across all clinics consistently reported high attitudes toward medical students. Mean scores were generally above 4.3 across domains, including acceptance of students' roles, feelings of participation in medical education, and perceptions of respect and professionalism.

The analysis demonstrated that none of some baseline characteristics, including age, level of education, and monthly income, were significantly associated with the mean attitude score in patients' attitudes. Spearman coefficients ranged from -0.034 to 0.051, indicating very weak correlations that were not statistically significant (Table 4).

Subgroup comparisons of patients' attitudes in different participant characteristic factors; gender, religion, method of payment for medical expense, experience with hospital visit, experience with medical student and type of clinic were found no statistical significance. In gender group between men and women (median [IQR], 4.53 [4.00-5.00] vs 4.65 [4.00-5.00]; $P = .960$, Mann-Whitney U test), religion (Buddhism vs other religions: median [IQR]; 4.59 [4.12-5.00] vs 5.00 [5.00-5.00]; $P = .083$, Mann-Whitney U test), level of educational ($P = .684$, Kruskal-Wallis test), method of healthcare payment ($P = .400$, Kruskal-Wallis test), previous hospital visit experience (median [IQR]; 4.53 [4.12-4.94] vs 4.65 [4.00-5.00]; $P = .626$, Mann-Whitney U test), type of clinic attended ($P = .129$, Kruskal-Wallis test), or previous experience with medical students (median [IQR]; 4.65 [4.18-5.00] vs 4.59 [4.00-5.00], $P = .632$, Mann-Whitney U test). Overall, patients' attitudes toward medical student participation did not differ significantly across participant characteristics.

Table 3. Patients' Attitudes Toward the Performance of Medical Students in the Longitudinal Ambulatory Experience I Course

Item	Score, Mean (SD)
I understand that medical students need to learn directly from patients	4.80 (0.44)
I feel comfortable participating in history taking and physical examination conducted by medical students	4.63 (0.55)
I am willing to undergo history taking and physical examination by medical students again in the future	4.51 (0.61)
I am willing to allow medical students to access information regarding my medical treatment	4.66 (0.52)
I believe that the involvement of medical students does not reduce the effectiveness of medical care	4.44 (0.76)
I am not concerned about potential mistakes made by medical students	4.13 (0.83)
I feel honored to be part of medical education	4.69 (0.54)
I feel comfortable when medical students are present during my care	4.43 (0.68)
I believe that the involvement of medical students does not waste my time	4.25 (0.82)
I do not feel that the presence of medical students delays my access to care by physicians	4.14 (0.89)
I feel that the use of communication devices or electronic tools by medical students for educational purposes during history taking and physical examination is acceptable	4.45 (0.67)
Medical students are competent in taking patient histories	4.60 (0.55)
Medical students are competent in performing physical examinations	4.52 (0.61)
Medical students provide useful advice regarding illness or health care	4.51 (0.63)
Medical students dress appropriately and professionally	4.72 (0.47)
Medical students communicate well and use appropriate language	4.68 (0.51)
Medical students treat me with respect	4.77 (0.44)
Overall	4.52 (0.45)

Table 4. Correlation Between Patients' Attitudes and Participant Demographic Characteristics

Correlation	Patients' Attitudes (17 items)	P Value
Age	0.051	.547
Level of education	-0.034	.685
Monthly income	0.079	.349

Discussion

This study found that patients and relatives/guardians attending outpatient clinics generally held highly positive attitudes toward the involvement of fourth-year medical students in the Longitudinal Ambulatory Experience I course. Overall acceptance was consistently high across multiple domains, suggesting that patients were comfortable with medical student participation in outpatient care and recognized its educational value. These findings are consistent with previous studies. A study conducted in Massachusetts reported that medical student involvement had little impact on patient satisfaction, suggesting that patients generally accept student participation in clinical care when appropriate supervision is provided.⁸ Similarly, a study conducted in family medicine settings in London and Newcastle found that patients generally expressed positive attitudes toward medical student involvement during consultations. However, patient acceptance varied according to the clinical context, with lower willingness to involve medical students during consultations involving emotionally sensitive or sexual health issues.⁶

One finding of this study was that participants agreed that medical students should learn directly from patients and expressed willingness to contribute to the education of future physicians. These findings suggest that patients viewed themselves as contributors to medical education and recognized the societal value of training future healthcare professionals. Previous studies have similarly reported that patients are generally willing to participate in medical education when they understand the educational role of medical students and recognize the importance of contributing to their clinical training.⁹ In a study from Denmark, patients undergoing cardiac surgery reported reassurance when examined by medical students under appropriate supervision and were willing to support students' development of clinical skills.¹⁰

The present findings extend this evidence to a longitudinal ambulatory learning model in Thailand, indicating that support for medical student participation is not limited to inpatient or traditional teaching environments. Participants rated aspects related to professionalism and communication highly, suggesting that these aspects were important components of patients' perceptions of medical student involvement. Previous studies in Saudi Arabia, have shown that patients value respectful communication, confidence, and respect for privacy during student encounters.⁹ In addition, patients in a study from the Minnesota Medical School reported improved understanding of their medical conditions after receiving explanations from medical students.¹¹ However, acceptance may vary in specific clinical contexts; a study among adult psychiatric patients in Ireland found that although most patients were comfortable seeing medical students, some preferred students to remain passive observers.¹²

Another important finding was that patients perceived medical students as active participants in clinical care rather than passive observers. Participants reported student involvement in history taking, physical examination, and counseling, while attending physicians remained involved in supervision. This model of supervised participation may contribute to patient confidence in student involvement. Previous studies have demonstrated that physician supervision is an important factor associated with patient willingness to participate in medical education, as it helps reassure patients regarding the safety and quality of care.¹ Similarly, studies in inpatient settings have shown that patients often participate in medical student teaching because they perceive it as a positive opportunity to contribute to medical education.⁵

Although overall acceptance was high, the lowest-rated items were related to concerns about potential mistakes, delays in care, and time efficiency. Similar concerns have been

reported in previous studies, particularly regarding longer consultation times and perceived inconvenience associated with student involvement.^{3, 12} These findings suggest that patients may balance the educational benefits of student participation against practical concerns during clinical encounters. Clear communication regarding students' roles and maintaining effective supervision may help address these concerns.

Interestingly, demographic characteristics and prior experience with medical students were not associated with attitudes toward student involvement. Although previous studies have reported associations between educational level or other sociodemographic characteristics and patient attitudes,¹³ such associations were not observed in the present study. This discrepancy may reflect differences in study populations and healthcare settings between studies.

Strengths

This study has several strengths. First, it evaluated patient attitudes within a longitudinal ambulatory education program, an area that has received relatively limited attention compared with traditional inpatient teaching settings. Second, participants were recruited from multiple outpatient clinics, providing perspectives from different clinical contexts. Third, the questionnaire demonstrated excellent internal consistency, supporting the reliability of the findings. Finally, the study contributes locally relevant evidence from a newly established teaching hospital in Thailand, where data regarding patient attitudes toward medical student involvement remain limited.

Limitations

Several limitations should be acknowledged. First, the cross-sectional design limits causal inference and captures attitudes at only one point in time. Second, the study was conducted at a single institution, which may limit generalizability to other healthcare settings or regions. Third, convenience sampling may have introduced selection bias, as individuals who agreed to participate may have been more supportive of medical education than those who declined. Fourth, attitudes were measured through self-reported questionnaires and may have been influenced by social desirability bias despite efforts to ensure anonymity. Finally, the generally high scores across questionnaire items suggest the possibility of a ceiling effect, which may have reduced the ability to detect meaningful differences between participant subgroups.

Implications for Practice and Future Research

The findings have important implications for medical education. The high level of patient acceptance supports the continued integration of medical students into outpatient clinical practice, provided that appropriate supervision is maintained. Educational programs should continue emphasizing communication skills, professionalism, and respectful patient interactions, as these aspects were highly valued by participants in this study. In addition, efforts to minimize concerns regarding efficiency and potential errors may further enhance patient experiences during teaching encounters.

Future studies should address these limitations by adopting longitudinal designs to examine changes in patient attitudes over time and to better understand the impact of repeated exposure to medical students. Multicenter studies involving diverse healthcare settings and geographic regions are needed to enhance the generalizability of findings. Future research should also consider more systematic sampling approaches to reduce

potential selection bias and recruit patients with a broader range of perspectives. In addition, combining quantitative surveys with qualitative methods, such as interviews or focus groups, may provide deeper insights into patients' experiences and the factors influencing their acceptance of medical student involvement. To address the potential ceiling effect observed in this study, future studies may consider refining the questionnaire by including more discriminative items or using measures that can better capture variations in patient attitudes. Further research examining the relationships among patient attitudes, satisfaction, and educational outcomes would help guide the development of effective and patient-centered clinical teaching programs.

Conclusions

Patients and relatives attending outpatient clinics demonstrated positive attitudes toward the participation of fourth-year medical students in the Longitudinal Ambulatory Experience I program. Overall, participants perceived medical student involvement positively and accepted their participation in outpatient clinical care when appropriate supervision was provided. These findings suggest that longitudinal ambulatory education can be implemented while maintaining patients' confidence in the quality of care. Continued emphasis on professionalism, patient-centered communication, and effective clinical supervision will be essential for sustaining patient trust while optimizing learning opportunities for future physicians.

Additional Information

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Ethics Approval: This study was approved by the Human Research Ethics Committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand (MURA2025/107 on 27 January 2025). Written informed consent was obtained from all participants prior to study participation.

Clinical Trial Consideration: This study does not report on a clinical trial.

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