



RESEARCH ARTICLE

Postgraduate Medical Students' Attitudes Towards Class Management Between Degree Levels and among Academic Grades

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ABSTRACT

Background: Effective class management is important for educational activities and helps to enhance the learning outcomes. However, information about the attitude of postgraduate students towards the class management in China is limited. We aimed to have a better understanding of the students' perceptions and behavior intentions of class management.

Methods: A large-scale questionnaire survey among postgraduate students at West China School of Medicine of Sichuan University was performed to collect students' opinions on class attendance, digital device use, examination assessment method, and class size. A comparison was made between master's and doctoral degrees and across different academic grade levels.

Results: A total of 823 medical students finally participated the survey and completed the questionnaire. Of these participants, there were 175 doctoral students and 648 master's students. There was a higher prevalence of punctuality issue in the higher-grade students. A greater number of master's students came late or left early for classes mainly due to the conflicts with their clinical work or duty schedules, whereas more doctoral students claimed that managing experimental tasks was their main reason for such behavior. Compared with master's students, a higher proportion of doctoral students supported that reason for using electronic devices in class was to complete scientific tasks. In terms of the examination assessment method, the majority of students preferred an open-book exam or essay-based assessments. Additionally, both high-grade and doctoral students showed a preference for smaller class sizes.

Conclusions: The attitude towards class management differed across different academic grades and between master's and doctoral degrees. Future medical education should carefully balance study, clinical work, and scientific research, and also encourage student to engage in the class management.

Keywords: postgraduate medical students; curriculum management; class behavior

Introduction

Since the Chinese government proposed the national strategy policy of Healthy China 2030¹, there has been a growing need for increasing training capacity within medical education system to cultivate professional doctors and establish a high-quality health service system. Chinese medical education has experienced a long period of reforms and currently developed a complex system with an array of medical programs and degrees.² Data from Chinese Medical Student Survey (CMSS)³, a nationwide survey obtaining the education and employment information of undergraduate medical students, revealed that 72.34% of the interviewees intended to continue further training for a master's or doctoral degree after graduation, and more than half of them have been admitted. Therefore, postgraduate medical education is a critical component of the medical education framework, both for the government and for the students aspiring to advance their careers in the healthcare field in China.

To better bridge the gap between campus life and professional work, the focus of higher education has been shifted from basic science and general knowledge learning to specialized and advanced training in postgraduate students. There are two types of postgraduate medical degrees: academic and professional degree. Scientific research skills are emphasized in academic education, while 3-year standardized residency training (SRT) is integrated into professional master's programme with a focus on improving clinical expertise.^{4,5} Regardless of the training models, postgraduate students are expected to engage in self-directed learning, establish the ability of analysis and solve the problems, and conduct original research. Due to the distinct cultivation objectives and learning modes, it is necessary to investigate the current situation of postgraduate education.

Effective class management and curriculum design is important for educational activities and can significantly enhance the learning outcomes. Modern education modality challenges the elements of traditional curriculum management, such as class size, classroom discipline, and examination methods.⁶ Compared with undergraduate students, master's and doctoral students may need a more flexible time schedule to arrange and balance public basic education courses and individualized research plan or clinical work.

Previous studies have consistently demonstrated a positive correlation between regular class attendance and improved academic performance.^{7,8} It should be noted that the impact of attendance on academic performance may vary depending on factors such as class size, course type, and student personality. For example, a study has suggested that the effect of attendance is often stronger for lower-performing students and in smaller classes.⁷ Meanwhile, the electronic device assists to rapidly update knowledge, but whether it can improve the study efficiency and acquire academic achievement has yet to be determined.⁹ Regarding the evaluation mode of exams, traditional end-of-semester written exams have been the mainstay in medical education. However, recent research has advocated for

a more comprehensive assessment approach to evaluate the practical skills of knowledge application.^{10,11}

To better manage postgraduate education, it is essential not only understand the current situation, but delve into the underlying motivations of the students' behaviors. A deeper exploration of the motivations can provide valuable insights to create a supportive and dynamic learning environment with more engagement and participation of the students. However, information about the attitude of postgraduate students from different academic grades towards the class management is limited.

In this study, we conducted a large-scale questionnaire survey among postgraduate students at West China School of Medicine of Sichuan University to collect their opinions on class attendance, digital device use, evaluation mode of exam, as well as the class size. We aimed to have a better understanding of the students' perceptions of class management and behavior intentions, so that it may provide guidance for future reforms in medical education.

Methods

STUDY DESIGN

This survey was conducted at West China School of Medicine in Sichuan University, a leading research-oriented university in China. This survey was distributed online from November to December in 2020. Postgraduate students were invited to take the online survey voluntarily. Our present study was part of the research aiming to examine the attitude and perceptions of postgraduate medical students towards the curriculum design and learning outcomes. The methodology and design of the questionnaire were described in detail in our previous study¹². As described in our earlier study¹², the sample size was determined to be adequate to ensure statistical reliability, and the overall internal consistency reliability were acceptable.

For our present study, we investigated the attitude of medical students towards class management by examining their preferences and perceptions. To achieve this, we designed a series of targeted questions to gather their opinions. The questions included:

1. The frequency of being late or leaving early. Students were asked to choose how often they arrived late to class or left early, with response categories including: frequently, occasionally, seldom, and never.
2. The main reasons for being late or leaving early. If students who selected frequently, occasionally, or seldom for the first question, they were further asked to choose the main reason from the following categories: conflict with clinical work or duty schedules, incomplete experimental tasks, physical discomfort, oversleeping, escaping class deliberately, or others.
3. Have you ever used an electronic device during class? Participants were asked whether they had ever used electronic devices, such as smartphones, laptops, or tablet computer during class. They were required to choose the answer

from the following categories: frequently, occasionally, seldom, or never.

4. The main reasons for using the electronic device during class? If students choose frequently, occasionally, or seldom for the third question, they need to select their primary reason of using the electronic device from the following categories: chatting and replying to messages; browsing social media for various kinds of news; lacking interest in the courses, not willing to pay attention to the class content, and only aiming to obtain the study credits; having high load of scientific tasks and needing to conduct the literature research, write papers, or work on scientific projects; or others
5. Does using an electronic device during class affect learning. Students were asked to evaluate how using electronic devices affects their learning. They needed to select their opinions from the following options: no impact at all; partially impacted, but they can get help from classmates or reviewing the content themselves after class; partially impacted, and they can't obtain the class content after class, resulting in an impact on their exam performance; moderately impacted, and students miss a large amount of the content, resulting in a notable impact on their exam performance; significantly impact, and students do not study the content, which severely affects their exam performance.
6. The evaluation mode you expect for the final exam. Students were asked to choose from the following options: closed-book exam; open-book exam; thesis or literature review; presentation using Microsoft PowerPoint; or others.
7. The student number you expect in each class. Participants were required to choose their preferred class size from the following ranges: 10-30; 30-50; 50-100; 100-150; or more than 150.

This study was approved by the Ethics Committee on Biomedical Research in West China Hospital of Sichuan University.

STUDY POPULATION

In this study, the final analysis of collected data was conducted based on the responses from medical students who have fully completed the questionnaire. All undergraduate students were medical student. Participants came from different subjects, including Clinical Medicine, Stomatology, Basic Medical Sciences and Forensic Medicine, Public Health, Pharmacy, State Key Laboratory, and Life Sciences. We explored the attitude of medical students to class management between doctoral students and master's students, and across first, second, and third academic year students.

STATISTICS

For our present study, SPSS 23.0 was employed to conduct data analysis. Students were categorized into groups based on their degree levels (doctoral and master's), as well as their academic years (the first, second, and third year). The differences between degree levels and across different academic levels were compared using Pearson chi-square test or Fisher's exact test. A p value of <0.05 was considered statistically significant.

Results

Overall, 823 medical students completed the questionnaire regarding their attitude toward the class management. Among them, there were 175 doctoral students and 648 master's students. The majority of respondents were first-year students (85.2%), followed by second-year students (9.4%) and third-year students (5.5%).

OPINIONS ON CLASS MANAGEMENT BETWEEN DOCTORAL AND MASTER'S STUDENTS

Doctoral students had a higher percentage of male participants compared to master's students ($p=0.017$). There was no significant difference in the distribution of "the frequency of being late or leaving early" between the two groups. However, the main reasons for such behavior differed significantly ($p<0.001$). A greater number of master's students thought that their being late or leaving early was due to the conflicts with clinical work or duty schedules, whereas more doctoral students stated that "incomplete experimental tasks" was the main reason.

Regarding the question "have you ever used an electronic device during class", the majority of students in both groups reported using devices frequently or occasionally. The main reasons for using electronic devices differed significantly between the two groups ($p=0.040$). The most common reason for "using the electronic device during class" in doctoral and master's students was the need to complete numerous scientific tasks and engage in scientific work, with a higher proportion of doctoral students taking it as their rationale for device use. Interestingly, there was no significant difference in responses to the question "does using an electronic device during class affect learning".

Most students expressed oppositions to closed-book exam as the evaluation mode for the final exam. They were more likely to do open-book exam or thesis or a literature review as the exam. Doctoral and master's students held different opinions on the ideal student number per class ($p<0.001$), with more doctoral students advocating for smaller size (10-30 or 30-50 students).

Table 1: The opinions on class management between doctoral and master's students

Variable	Overall (n=823)	Doctoral degree (n=175)	Master's degree (n=648)	P value
Sex, male, n (%)	254 (30.9)	67 (38.3)	187 (28.9)	0.017
Academic year*				
First year, n (%)	700 (85.2)	121 (69.1)	579 (89.5)	<0.001
Second year, n (%)	77 (9.4)	30 (17.1)	47 (7.3)	
Third year, n (%)	45 (5.5)	24 (13.7)	21 (3.2)	
The frequency of being late or leaving early n (%)				
Frequently	59 (7.2)	11 (6.3)	48 (7.4)	0.659
Occasionally	340 (41.3)	77 (44.0)	263 (40.6)	
Seldom	225 (27.3)	50 (28.6)	175 (27.0)	
Never	199 (24.2)	37 (21.1)	162 (25.0)	
The main reasons for being late or leaving early † n (%)				
Conflict with clinical work or duty schedules	307 (49.2)	48 (34.8)	259 (53.3)	<0.001§
Incomplete experimental tasks	206 (33.0)	75 (54.3)	131 (27.0)	
Physical discomfort	52 (8.3)	10 (7.2)	42 (8.6)	
Oversleeping	36 (5.8)	1 (0.7)	35 (7.2)	
Escaping class deliberately	2 (0.3)	0	2 (0.4)	
Others	21 (3.4)	4 (2.9)	17 (3.5)	
Have you ever used an electronic device during class? n (%)				
Frequently	365 (44.3)	64 (36.6)	301 (46.5)	0.072
Occasionally	331 (40.2)	77 (44.0)	254 (39.2)	
Seldom	100 (12.2)	25 (14.3)	75 (11.6)	
Never	27 (3.3)	9 (5.1)	18 (2.8)	
The main reasons for using the electronic device during class†† n (%)				
Chatting and replying to messages	131 (16.5)	28 (16.9)	103 (16.3)	0.040
Browsing social media for of news	28 (3.5)	4 (2.4)	24 (3.8)	
Lacking interest in the courses, and only aiming to obtain the study credits	52 (6.5)	10 (6.0)	42 (6.7)	
Doing scientific tasks	434 (54.5)	105 (63.3)	329 (52.2)	
Others	151 (19.0)	19 (11.4)	132 (21.0)	
The student number you expect in each class n (%)				
10-30	69 (8.4)	26 (14.9)	43 (6.6)	<0.001
30-50	297 (36.1)	79 (45.1)	218 (33.6)	
50-100	324 (39.4)	52 (29.7)	272 (42.0)	
100-150	95 (11.5)	14 (8.0)	81 (12.5)	
More than 150	38 (4.6)	4 (2.3)	34 (5.2)	

*One student was excluded from this analysis because of not belonging to the 3 grades.

†Data were available for 624 students because 199 students stated that they had never been late or left early.

††Data were available for 796 students because 27 students had never used electronic device during class.

§ Fisher's exact test

OPINIONS ON CLASS MANAGEMENT AMONG DIFFERENT GRADES

Significant differences were observed in "the frequency of being late or leaving early" ($p < 0.001$), with higher grade students (grade 2 and 3) more frequently reporting being late or leaving early, as compared with that of the first year students. The main reasons for "being late or leaving early" did not differ significantly among the groups.

The majority reason for "using the electronic device during class" across all three grades was his or her need to do scientific tasks. Additionally, there was no significant difference in the main reasons for "using the electronic device during class" among the groups.

Similarly, students in the three grades generally thought that "using the electronic device during class" had no or only a partial impact on their learning. There was no significant difference in responses to the question "does using an electronic device during class affect learning" among the three grades.

The majority of students in the three groups preferred open-book exam, thesis, or a literature review as their exam evaluation methods. Significant differences were also noted in the preferred class size among the groups ($p < 0.001$), with more students with high grade (grade 2 and 3) favoring smaller class size (10-30 or 30-50 students).

Table 2: The opinions on class management among different grades

Variable	First year (n=700)	Second year (n=77)	Third year (n=45)	P value
Sex, male, n (%)	215 (30.7)	22 (28.6)	16 (35.6)	0.719
The frequency of being late or leaving early n (%)				
Frequently	48 (6.9)	5 (6.5)	6 (13.3)	<0.001
Occasionally	268 (38.3)	48 (62.3)	23 (51.1)	
Seldom	200 (28.6)	14 (18.2)	11 (24.4)	
Never	184 (26.3)	10 (13.0)	5 (11.1)	
The main reasons for being late or leaving early † n (%)				
Conflict with clinical work or duty schedules	255 (49.4)	29 (43.3)	23 (57.5)	0.193
Incomplete experimental tasks	166 (32.2)	23 (34.3)	16 (40.0)	
Physical discomfort	40 (7.8)	11 (16.4)	1 (2.5)	
Oversleeping	34 (6.6)	2 (3.0)	0	
Escaping class deliberately	2 (0.4)	0	0	
Others	19 (3.7)	2 (3.0)	0	
Have you ever used an electronic device during class? n (%)				
Frequently	322 (46.0)	28 (36.4)	15 (33.3)	0.252
Occasionally	277 (39.6)	32 (41.6)	21 (46.7)	
Seldom	80 (11.4)	14 (18.2)	6 (13.3)	
Never	21 (3.0)	3 (3.9)	3 (6.7)	
The main reasons for using the electronic device during class††				
Chatting and replying to messages	106 (15.6)	14 (18.9)	11 (26.2)	0.168
Browsing social media for news	23 (3.4)	2 (2.7)	3 (7.1)	
Lacking interest in the courses, and only aiming to obtain the study credits	46 (6.8)	5 (6.8)	1 (2.4)	
Doing scientific tasks	366 (53.9)	43 (58.1)	24 (57.1)	
Others	138 (20.3)	10 (13.5)	3 (7.1)	
The student number you expect in each class n (%)				
10-30	45 (6.4)	11 (14.3)	13 (28.9)	<0.001
30-50	247 (35.3)	30 (39.0)	20 (44.4)	
50-100	288 (41.1)	26 (33.8)	10 (22.2)	
100-150	84 (12.0)	10 (13.0)	0	
More than 150	36 (5.1)	0	2 (4.4)	

†Data were available for 623 students because 199 students stated that they had never been late or left early.

††Data were available for 795 students because 27 students had never used electronic device during class.

Discussion

To date, the attitude of postgraduate medical students towards class management remains unclear. Our study performed a large-scale questionnaire survey to collect opinions from medical students pursuing master's and doctoral degrees. It provided an interesting comparison of students' perceptions across different grades and between different degrees. These findings may offer new insight in medical education.

It is well acknowledged that a series of factors can attribute to class attendance, including students' self-efficacy and motivation, teachers' teaching quality and tolerance of the behaviors, nature of the curriculum, and utilitarian tendency influenced by the society.^{13,14} Our study concentrated more on the students' perspective. To be noted, among medical postgraduate students, nearly one fourth of the students have not been late or left early for class. For the students with punctuality issues, a majority of them stated they had this behavior due to the conflicts with clinical work or experimental task, rather

than the disengaged attitude reported in other studies, like oversleeping and deliberate escape. Doctoral students tended to squeeze time for laboratory work, while master's students struggled to balance the clinical duty schedules with the public basic courses.

It is interesting to find that similar reason has been given regarding the usage of the electronic devices during class. In our study, although nearly 75% of the students believed that learning could be distracted by individual electronic devices to some extent, the vast majority of them had the experience of using the devices in class. Medical students argued that they had this behavior commonly because of the heavy scientific work, with the higher proportion of doctoral students. These phenomena reflect the postgraduate medical students were under pressure of study, scientific research and clinical practice.

To improve the capability of dealing with clinical cases, SRT as a national strategy had been launched since 2013 and fully implemented in 2020.^{4,15} In China, the residency

education was integrated with equivalent professional programme only in master's degree instead of doctoral degree. This "dual track" training mode requires professional master's students to spend plenty of time fulfilling the 3-year compulsory rotation in clinical departments, and largely limit their energy for theoretical courses and scientific research.¹⁶ However, developing abilities of solving scientific problems is highly encouraged in doctoral students. The different cultivation goals and programme assignments may result in the discrepant explanation for unpunctuality between master's and doctoral students.

Electronic device usage has become ubiquitous in college classes with rapid technology development. Although it seems to be an unwelcomed behavior, whether mobile technology influences the academic achievement is still undetermined.¹⁷⁻¹⁹ A previous study has indicated that mobile devices were correlated with reduced course engagement, but this relationship was mediated by device type and using purposes.²⁰ In addition to entertainment, electronic technology may be productive tools to enhance class efficiency. For example, students can take a fast note via taking photos and search the Internet for a better understanding of the knowledge. In the era of information explosion, new knowledge is generated at an unprecedented rate. Textbooks provide classical theories, while updated information can be acquired through Internet by using mobile devices, particularly in the major of clinical medicine. Therefore, we should balance the disadvantages and make best of the advantages of mobile technology.

Structured use of electronic devices should be encouraged in higher education.²¹ New media-assisted teaching in clinical medical postgraduate education can concretize abstract content and attract learning interest, so that it may improve studying efficiency and student satisfaction.²² On the other hand, mobile phone or laptop usage during class reflects the students' attitude of choosing scientific task as the more important assignment and the ignorance of the lecture. To address the problem, A diverse range of curricula, which give equal consideration of the requirements of postgraduate degree, clinical work and scientific research, have been established at West China School of Medicine, such as "clinical research design and statistical analysis" and "academic writing".²³ These courses may improve the students' engagement, because they are highly applicable and can provide instructions in clinical research.

These class behaviors reflect the postgraduate medical students were under pressure of study, scientific research and clinical practice. In order to settle the conflicts and improve studying efficiency, West China School of Medicine of Sichuan University has introduced a series of measures. For example, most of the courses are arranged on evenings and weekends in the first semester.²³ Since 2019, professional-degree students have not been assigned night duties during the first six months of rotation to ensure class attendance.¹²

Similar to the model introduced in the undergraduate education,²⁴ non-standardized answer assessment has been gradually applied to master's and doctoral

education at West China School of Medicine. It is an evaluation system involving assessments with various forms at different stages as of learning process. For example, total score is consisted of the records from class attendance, quizzes, skill test and final exam. From a superficial perspective, this reform may encourage students to participate in each class. However, more importantly, it has been shifting towards a competency-based medical education from the traditional exam-oriented education, which may improve the comprehensive ability of students and curriculum quality.²⁴ Among varied forms of final exams, open-book exam and literature review were more popular than presentation and closed-book exam according to the students' expectation in our survey. In fact, "open-resource" exams have been widely applied in the current assessment system, especially in the optional courses. This evaluation strategy may help students to understand the subject deeply, reduce stress levels and balance the heavy burden of the curricula.^{25,26}

Moreover, prior studies also mentioned that students may behave worse in large classes.²⁷ Actually, the influences of class size on student behaviors and education outcomes have been vigorously investigated.^{28,29} Class size and the ratio of staff to students are often used as measures to evaluate the quality of higher education.³⁰ Empirically, we may argue that small-size class is associated with better education effects and student achievement.³¹ While some studies found a nonlinear impact of class size on study performance, demonstrating it would be challenging to employ a "one-size-fits-all" approach throughout all of the curricula.^{32,33} West China School of Medicine has implemented "inquiry-based small-class" teaching mode for at least one decade. Large classes remained the traditional teaching mode, which is primarily lecture-based by the teachers. In contrast, small class applies a variety of innovative teaching methods, such as problem-based learning, case-based learning, flipped classroom and new media application, to inspire the learning enthusiasm and improve students' innovation and practical ability.³⁴ Our study revealed that higher-grade students (second or third-year students and doctoral students) were more likely to advocate for smaller-size class. We inferred that different needs for class size among different-grade students might result from the sequence of the curriculum arrangement. Public courses are generally arranged in the first year of the medical programme, followed by professional courses, in accordance with students' knowledge level. It seems difficult to share professional courses with students from varied majors. Small-sized professional courses allow a more tailored education and individualized support, so that it may improve pedagogical and curricular quality.

The present study updated information of the attitude towards curriculum discipline and management from the aspect of postgraduate medical students. Some classroom behaviors, such as punctuality issues for class and mobile electronic device usage, have been widely explored in primary, secondary and undergraduate students in previous work. However, the data for postgraduate medical students is quite limited. This knowledge may provide guidance for future reforms in medical education.

We acknowledged there were several limitations. Firstly, since the investigation was conducted in a single school, the conclusion should be cautiously generalized to all the medical students. Nevertheless, the analysis was based on a large-scale and well-designed questionnaire collecting opinions of postgraduate students from a Double First Class Discipline Construction university, which guarantee the study quality and result reliability. Secondly, this is a questionnaire targeted for enrollment of the first-grade students, so limited viewpoints were gathered from students in grade two and three. Thirdly, the present study was performed during the period of COVID-19. The pandemic might have some influences on the education strategies and students' mentality. Therefore, multi-center data with a large sample size are need to verify the findings in the future. We advise to explore some other possible factors influencing the class behaviors and curriculum management, such as course types and majors, which may assist to give more individualized suggestion for education.

Conclusion

In conclusion, the attitudes towards the curriculum management varied between different grades and different pursuing degrees of the postgraduate medical students. The main conflict with the courses comes from clinical work and scientific task, especially observed in high-grade students or doctoral students. Non-closed-book exams and small-sized class are more popular in students. This study provides useful information and directions for medical education reforms. Future medical education should balance the relationship of study, clinical assignment and scientific research and encourage student engagement in the curriculum.

Conflicts of Interest Statement

The authors have no conflicts of interest to declare.

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