

# Psychiatry Curriculum: How Does It Affect Medical Students' Attitude Toward Psychiatry?

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## Research Article

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# Abstract

## Background

The purpose of this study was to identify the attitude of South Korean medical school students towards psychiatry and to analyze how lectures and clinical clerkship in psychiatry effect changes in students' attitudes.

## Methods

A total of 100 medical school students were recruited as subjects in the study, 86 of whom completed psychiatry lectures and underwent psychiatry clerkship from March 2015 to August 2018. The participating students completed a survey, which included demographic data, specialty choice, and attitude towards psychiatry.

## Results

Subjects who completed lectures and clinical clerkship in psychiatry showed positive changes in attitude towards psychiatry in the following items: "Among mental health professionals, psychiatrists have the most authority and influence" ( $p=0.002$ ), "Psychiatrists frequently abuse their legal power to hospitalize patients against their will" ( $p<0.001$ ), and "Many people who could not obtain a residency position in other specialties eventually enter psychiatry" ( $p=0.028$ ). However, negative changes in attitude towards psychiatry were shown in the following item: "On average, psychiatrists make as much money as most other doctors" ( $p=0.008$ ). Also, specific medical school factors scored positively overall. Although it was not statistically significant, the questionnaire item "During my psychiatry rotation, psychiatry residents were good role models" was more positively observed by students after completion of psychiatry lectures and clerkship.

## Conclusion

After each curriculum, certain attitudes toward psychiatry were positively changed, but others either remained unchanged or were negatively changed. By using these study results to revise the current curriculum, medical school students' attitude towards psychiatry can be improved.

## Introduction

Internationally, psychiatry is a relatively unpopular specialty among medical school students; thus, many studies have focused on finding ways to encourage an increasing number of talented students to choose psychiatry as their specialty [1–5]. However, in South Korea, psychiatry is one of the most preferred specialties. In their study of medical school students in Daegu, Kang et al. [6] found psychiatry to be the most popular specialty. The national status of choice rates for medical specialties in Korea, aggregated by the Ministry of Health and Welfare every year, states that psychiatry has averaged over 140% over the past four years and it also supports this perception [7]. However, while interest in—and research toward—

better psychiatry curriculums should be steadily maintained independent of medical specialty preference, domestic studies on this issue have remained uncommon to date.

Medical specialty choice is influenced by many factors, including individual personality, values, needs, academic schedules and experiences, social environments, and recognition of specialties [8–12]. Wasserman [13] reported that 50% of medical school students changed their medical specialty choice while attending medical school, and a recent large study found that “Psychiatry clerkship rated excellent” was the most important factor for choosing psychiatry as a specialty at graduation [5]. Hong et al. [14] reported that after completing psychiatry clerkships, medical school students’ perceptions of mental illness changed positively, with increases in patient-centered attitudes and decreases in authoritarian tendencies. Contrastingly, Seong et al. [15] reported that because knowledge regarding mental illness, which was increased through the psychiatry curriculum, interacted with the students’ existing conservative tendencies, many medical school students who had completed psychiatry clerkship tended to develop a more negative attitude toward mental illness compared to the general public and medical school students who had not experienced psychiatry clerkship. Furthermore, in an analysis of non-psychiatric doctors’ perceptions and attitudes toward psychiatry, Ryu et al. [16] reported that lower age or less clinical experience was associated with more negative perceptions and attitudes toward psychiatry. However, existing studies addressed situations in which only a part of the psychiatry curriculum was completed, or only a cross-sectional assessment of attitudes at a specific point in time was completed [14]. Further, other aspects were insufficiently examined due to lack of specificity in the evaluation items regarding medical school students’ attitudes toward psychiatry and the factors that affected these attitudes [15].

To nurture high-quality medical school students, it is necessary to understand their perceptions and attitudes toward psychiatry as well as the effect of psychiatry lectures and clerkships on those attitudes; it is also necessary to modify and supplement the curriculum based on those factors mentioned above. For those reasons, we analyzed attitudinal changes among medical school students at a single medical school before and after they completed a psychiatry curriculum (psychiatry lectures and clerkship).

## Methods

### Participants and Procedures

We conducted this study between March 2015 and August 2018 at Catholic University of Daegu, School of Medicine, where the psychiatry curriculum consists of 48 hours’ worth of lectures taught in the second year and four weeks’ worth of clerkship conducted in the sixth year. A total of 100 medical school students participated in this study; however, four of them failed to secure standard scores and hence could not advance to the next academic year, seven provided unreliable responses, and three had incomplete responses for unclear reasons. Ultimately a total of 86 medical school students completed 48 hours of psychiatry lectures and four weeks of psychiatry clerkship.

Before completing the curriculum, research subjects filled out a questionnaire designed to evaluate sociodemographic characteristics; before and after the curriculum, they completed a questionnaire for evaluating attitudes toward psychiatry and their specialty selection.

The study protocol was reviewed and approved by the Institutional Review Board (IRB) of the Daegu Catholic University Medical Center, which waived the need to obtain informed consent from the subjects (CR-19-173). All clinical investigations were conducted according to the principles expressed in the Declaration of Helsinki.

## Materials

### Subjects' Sociodemographic Characteristics

Sociodemographic information included information such as age, sex, family type (large family, nuclear family), and growth environment (rural, urban).

### The Balon Attitudes Towards Psychiatry Questionnaire (the "Balon Scale")

The Balon Scale was developed in 1999 for assessing medical school students' attitudes toward psychiatry; it has been translated into many languages and used in numerous studies to date [17]. The scale consists of 29 questions, including details regarding the strengths and efficacy of psychiatry, the role and functions of psychiatrists, social awareness of psychiatry, psychiatry as a profession, and factors within a specific medical school. For each question, students are required to choose one of the following responses: "strongly agree," "moderately agree", "moderately disagree" and "strongly disagree." As in previous studies using this scale [1, 2], the responses "strongly agree" and "moderately agree" were analyzed as agreement responses (agree), and "moderately disagree" and "strongly disagree" were analyzed as disagreement responses (disagree) in order to easily interpret students' attitudes toward psychiatry. Furthermore, Questions 24 to 29, which were related to factors within a specific medical school, were assessed only after the subjects' completion of the psychiatry curriculum (e.g., "Teaching of psychiatry at my medical school is interesting and of good quality").

## Statistical Analysis

Independent t-tests and  $\chi^2$ -tests were used to compare the sociodemographic information of subjects who applied for a psychiatry specialty with that of those who did not. Changes in the Balon Scale before and after the implementation of the psychiatry curriculum were analyzed using the generalized estimating equation. In the case of Questions 24 to 29, related to factors within a specific medical school in the Balon scale, the McNemar test was used to compare values of specific factors of medical school after completion of the psychiatry lectures and those after completion of the psychiatry clerkship. Statistical analysis was performed using SPSS 19.0 version for Windows, and a p value < 0.05 was considered indicative of statistical significance.

## Results

A total of 100 students participated; 14 were excluded. We analyzed 86 pieces of data for changes in the Balon Scale before and after completion of the psychiatry curriculum.

Sociodemographic information showed that 73 participants were male (73.0%), and 27 were female (27.0%), and the average age was  $23.78 \pm 2.10$ . Most subjects belonged to nuclear families (98 people, 98.0%) and lived in an urban environment (83 people, 83.0%) (Table 1). Before implementation of the psychiatry curriculum, the average age of those who applied to study psychiatry was  $23.50 \pm 1.43$ , and that of those who did not was  $23.81 \pm 2.17$ ; statistically significant differences were not identified in the average age ( $P = 0.659$ ). Furthermore, no significant differences were observed between psychiatry applicants and non-applicants in terms of sex ( $P = 0.280$ ), family type ( $P = 1.000$ ), and growth environment ( $P = 0.064$ ). When classified and analyzed based on specialty choice after completion of the psychiatry curriculum, the average age ( $P = 0.304$ ), sex ( $P = 1.000$ ), family type ( $P = 1.000$ ), and growth environment ( $P = 0.093$ ) of the participants were not statistically significant (Table 2).

Table 1  
Sociodemographic characteristics of study subjects

	Subject(n = 100)
<b>Age (years)</b>	23.78 ± 2.10
<b>Sex</b>	
Male	73(73.0)
Female	27(27.0)
<b>Type of family</b>	
Nuclear	98(98.0)
Joint	2(2.0)
<b>Growth environment</b>	
Urban	83(83.0)
Rural	17(17.0)
Values are mean ± standard deviation or n(%)	

Table 2  
Sociodemographic characteristics of study subjects based on specialty choice

	Before psychiatric curriculum			After psychiatric curriculum		
	Psychiatry (n = 10)	Non- psychiatry (n = 90)	p- value	Psychiatry (n = 7)	Non- psychiatry (n = 93)	p- value
<b>Age (years)</b>	23.50 ± 1.43	23.81 ± 2.17	0.659	24.57 ± 1.62	23.72 ± 2.13	0.304
<b>Sex</b>						
Male	9(90.0)	64(71.1)	0.280	5(71.4)	68(73.1)	1.000
Female	1(10.0)	26(28.9)		2(28.6)	25(26.9)	
<b>Type of family</b>						
Nuclear	10(100)	88(97.8)	1.000	7(100)	91(97.8)	1.000
Joint	0(0)	2(2.2)		0	2(2.2)	
<b>Growth environment</b>						
Urban	6(60.0)	77(85.6)	0.064	4(57.1)	79(84.9)	0.093
Rural	4(40.0)	13(14.4)		3(42.9)	14(15.1)	
Values are mean ± standard deviation or n(%), *: $P < 0.05$						

Analysis of the 86 students who completed both the psychiatry lectures and the clinical clerkships showed that positive attitudinal changes were statistically significant for the following items: "Among mental health professionals, psychiatrists have the most authority and influence" ( $P = 0.002$ ), "Psychiatrists frequently abuse their legal power to hospitalize patients against their will" ( $P < 0.001$ ), and "Many people who could not obtain a residency position in other specialties eventually enter psychiatry" ( $P = 0.028$ ). "On average, psychiatrists make as much money as most other doctors" ( $P = 0.008$ ) showed a statistically significant increase in terms of negative responses (Table 3).

Table 3

Medical students' attitudes toward psychiatry before and after completion of psychiatry lectures and clerkships

	Before lectures <sup>1</sup>	After lectures <sup>2</sup>	After clerkship <sup>3</sup>	p-value
	Agree(%) Disagree(%)	Agree(%) Disagree(%)	Agree(%) Disagree(%)	
<b>Overall merits of psychiatry</b>				
Psychiatric research has made good strides in advancing care of the major mental disorders	88.4 11.6	93.0 7.0	96.5 3.5	0.178
Psychiatry is a rapidly expanding frontier of medicine	69.8 30.2	76.7 23.3	82.6 17.4	0.122
Psychiatry is unscientific and imprecise	20.9 79.1	11.6 88.4	11.6 88.4	0.115
<b>Efficacy</b>				
If someone in my family was very emotionally upset and the situation did not seem to be improving, I would recommend a psychiatric consultation	94.2 5.8	95.3 4.7	91.9 8.1	0.528
Psychiatric consultation for medical or surgical patients is often helpful	98.8 1.2	98.8 1.2	97.7 2.3	0.787
Psychiatric treatment is helpful to most people who receive it	82.6 17.4	79.1 20.9	86.0 14.0	0.322
<b>Role, definition and functioning of Psychiatrists</b>				
Psychiatry is not a genuine and valid branch of medicine	95.3 4.7	96.5 3.5	96.5 3.5	0.848
Most psychiatrists are clear, logical thinkers	83.7 16.3	77.9 22.1	87.2 12.8	0.144

\*:  $P < 0.05$ , \*\*:  $P < 0.01$ , \*\*\*:  $P < 0.001$ . 1: Medical school students completed this questionnaire before attending psychiatry lectures. 2: Medical school students completed this questionnaire after attending psychiatry lectures. 3: Medical school students completed this questionnaire after completing psychiatry lectures and clerkships. A > B: The value of B has decreased significantly based on the value of A.

	Before lectures <sup>1</sup>	After lectures <sup>2</sup>	After clerkship <sup>3</sup>	p-value
	Agree(%)	Agree(%)	Agree(%)	
	Disagree(%)	Disagree(%)	Disagree(%)	
With few exceptions, clinical psychologists and social workers are just as qualified as psychiatrists to diagnose and treat emotionally disturbed persons	43.0	37.2	47.7	0.286
	57.0	62.8	52.3	
Among mental health professionals, psychiatrists have the most authority and influence	80.2	89.5	95.35	0.002**
	19.8	10.5	4.65	
Psychiatrists are too frequently apologetic when teaching psychiatry	26.7	27.9	36.0	0.322
	73.3	72.1	64.0	
Psychiatry is too 'biologically' minded and not attentive enough to the patient's personal life and psychological problems	25.6	22.1	20.9	0.699
	74.4	77.9	79.1	
Psychiatry is too analytical, theoretical, and psychodynamic, and not attentive enough to patient's physiology	25.6	26.7	20.9	0.596
	74.4	73.3	79.1	
<b>Possible abuse and social criticism</b>				
Psychiatrists frequently abuse their legal power to hospitalize patients against their will	29.1	12.8	10.5	< 0.001***
	70.9	87.2	89.5	
On average, psychiatrists make as much money as most other doctors	57.0	51.2	36.0	0.008**
	43.0	48.8	64.0	
<b>Career and personal reward</b>				
Psychiatry has a low prestige among the general public	23.3	23.3	19.8	0.805
	76.7	76.7	80.2	
Psychiatry has a high status among other medical disciplines	30.2	18.6	20.9	0.077
	69.8	81.4	79.1	

\*:  $P < 0.05$ , \*\*:  $P < 0.01$ , \*\*\*:  $P < 0.001$ . 1: Medical school students completed this questionnaire before attending psychiatry lectures. 2: Medical school students completed this questionnaire after attending psychiatry lectures. 3: Medical school students completed this questionnaire after completing psychiatry lectures and clerkships. A > B: The value of B has decreased significantly based on the value of A.

	Before lectures <sup>1</sup>	After lectures <sup>2</sup>	After clerkship <sup>3</sup>	p-value
	Agree(%)	Agree(%)	Agree(%)	
	Disagree(%)	Disagree(%)	Disagree(%)	
Many people who could not obtain a residency position in other specialties eventually enter psychiatry	12.8	3.5	5.8	0.028*
	87.2	96.5	94.2	1 > 2
Psychiatry is a discipline filled with international medical graduates whose skills are of low quality	10.5	0	5.8	0.290
	89.5	100	94.2	
My family would discourage me from entering psychiatry	20.9	11.6	22.1	0.131
	79.1	88.4	77.9	
Friends and fellow students would discourage me from entering psychiatry	24.4	10.5	17.4	0.051
	75.6	89.5	82.6	
If a student expresses interest in psychiatry, he or she risks being associated with a group of other would-be psychiatrists who are often seen by others as odd, peculiar or neurotic	31.4	26.7	29.1	0.708
	68.6	73.3	70.9	
I feel uncomfortable with mentally ill patients	55.8	52.3	43.0	0.115
	44.2	47.7	57.0	
*: $P < 0.05$ , **: $P < 0.01$ , ***: $P < 0.001$ . 1: Medical school students completed this questionnaire before attending psychiatry lectures. 2: Medical school students completed this questionnaire after attending psychiatry lectures. 3: Medical school students completed this questionnaire after completing psychiatry lectures and clerkships. A > B: The value of B has decreased significantly based on the value of A.				

Participants' attitudes toward "the factors within a specific medical school" were generally positive. Over 30% of responders agreed with the item "Although I am interested in psychiatry, my medical school made no effort to encourage me to become a psychiatrist," and relatively higher proportions of negative perceptions were indicated compared to other questions. "During my psychiatry rotation, psychiatry residents were good role models" did not receive statistically significant responses, but attitudes toward this item became more positive when assessed after the clinical clerkship compared to attitudes after the lectures; agreement rates were 83.7% after lectures and 93.0% after clerkship ( $P = 0.057$ ) (Table 4).

Table 4

Medical students' attitudes toward psychiatry (specific medical school factors) after completion of psychiatry lectures and clerkships

	After lectures	After clerkship	McNemar
	Agree(%)	Agree(%)	p-value
	Disagree(%)	Disagree(%)	
<b>Overall merits of psychiatry</b>			
Teaching of psychiatry at my medical school is interesting and of good quality	93.0	94.2	1.000
	7.0	5.8	
During my psychiatry rotation, psychiatry residents were good role models	83.7	93.0	0.057
	16.3	7.0	
Attending psychiatrists during my psychiatry rotation were good role models	87.2	95.3	0.092
	12.8	4.7	
Most psychiatrists at my medical school are clear, logical thinkers	95.3	96.5	1.000
	4.7	3.5	
Most non-psychiatry staff at my medical school are respectful of psychiatry	84.9	87.2	0.804
	15.1	12.8	
Although I am interested in psychiatry, no effort was made to encourage my becoming a psychiatrist at my medical school	38.4	31.3	0.405
	61.6	68.6	
*: $P < 0.05$			

Finally, analysis of specialty choices indicated by survey responses before implementation of the psychiatry curriculum showed that 51 (51.0%) of the subjects had not yet decided on their careers; specialty choices were ranked in this order: psychiatry (10, 10.0%), surgery (8, 8.0%), internal medicine (7, 7.0%), orthopedics (5, 5.0%), and pediatrics (3, 3.0%). Of the 10 students who wanted to apply for a psychiatry specialty before implementation of the psychiatry curriculum, six still did after completing the curriculum, and one student changed their specialty choice from another department to psychiatry after completing the curriculum.

## Discussion

This study aimed to identify medical school students' attitudes toward psychiatry and investigate how psychiatry lectures and clerkships could change students' attitudes toward psychiatry. Our hope was to gain insights to develop better psychiatry curriculums and nurture good medical students. A comparison

of those who applied to study psychiatry and those who did not before and after the completion of the psychiatry curriculum showed that there were no significant differences in terms of sex, family type, and growth environment between the groups. Before the implementation of the curriculum, medical school students' attitudes toward psychiatry were generally positive. Certain attitudes toward psychiatry became more positive after the psychiatry lectures and clerkships were completed; this finding agrees with those of previous studies [1, 2, 5]. The percentage of agreement with the statement "Among mental health professionals, psychiatrists have the most authority and influence" changed from 80.2% before curriculum completion to 95.35% after the curriculum completion; this was statistically significant. Psychiatrists may serve as leaders in teams consisting of a variety of professionals, including nurses, social workers, and clinical psychologists, where they may provide guidance and supervision for treatment while collaborating with other professionals [18]. During the implementation of the psychiatry curriculum, medical school students' direct and indirect experiences with the role of psychiatry may have brought about positive changes in their perceptions of psychiatrists' authority and influence.

A statistically significant positive change was observed for the item "Psychiatrists frequently abuse their legal power to hospitalize patients against their will" after the completion of the psychiatry curriculum. Respondents' agreement with this item fell. Agreement rates were 29.1% before the implementation of the psychiatry lectures, 12.8% after the psychiatry lectures were completed, and 10.5% after the psychiatry clerkship was completed. Psychiatry is, in fact, the only medical department that can enforce compulsory hospitalization against the will of mentally ill patients [19]. Compulsory hospitalization provides treatment to patients in a safe and appropriate way, but some questions remain regarding its social, ethical, and legal justifications [19]. Thus, it is possible that, thanks to the psychiatry lectures and clerkships, medical school students who previously had negative perspectives on compulsory hospitalization received accurate information about the characteristics of and treatments for mental illness; they may have also learned about the criteria necessary for authorizing compulsory hospitalization, and this new knowledge may have affected the reduction in agreement responses to this question.

A statistically significant positive change was also observed for the item "Many people who could not obtain a residency position in other specialties eventually enter psychiatry." According to the annual report compiled by the Ministry of Health and Welfare, the average rate of choosing psychiatry as the specialty over the past four years has been over 140%; furthermore, psychiatry is a popular specialty that offers a residency position based on students' competitive performance [7]. These facts may have affected medical school students' perception of psychiatry residents. Further, although it was not statistically significant, the increase in the proportion of agreement with the item "During my psychiatry rotation, psychiatry residents were good role models" may have had a positive effect on responses for that question.

Before the implementation of the psychiatry curriculum, the only question that received a higher number of responses in terms of negative attitudes was "I feel uncomfortable with mentally ill patients." The agreement response for the statement was 55.8%, while the disagreement response was 44.2%. Although

no significant changes were observed after completion of the psychiatry curriculum, after completion of the psychiatry clerkship the agreement response rate fell to 43.0% and the disagreement response rate rose to 57.0%. This finding agrees with previous research that showed that medical students' attitudes toward patients were flexible and that psychiatry clinical clerkships could be an efficient way to inculcate more patient-centered attitudes among students [14]. Medical school students' adaptive tendencies are related to positive experiences, such as vitality and concentration in academic work, and also to confidence in task performance, actions for performing required tasks, and stress levels [20, 21]. These tendencies may also be related to academic self-efficacy and burnout among medical school students in the psychiatry curriculum, which includes psychiatric ward practice, continuous contact with patients, and large amounts of learning, tasks, and tests [20]. In academic performance, higher academic self-efficiency is associated with higher achievement levels and lower burnout. Therefore, in order to bring about improvements in psychiatry curricula, it is necessary to understand the relationships between medical school students' adaptive tendencies and their positive attitudinal changes toward psychiatry, observed after they completed the psychiatry clerkship. These relationships should be considered in order to bring about future improvements in psychiatry curriculums.

Negatively significant attitudinal changes were observed in the responses to the item "On average, psychiatrists make as much money as most other doctors." The agreement response rate before the psychiatry curriculum was completed was 57.0%, and agreement rates before and after the clerkship were 51.2% and 36.0%, respectively. Lee [22] reported that income, work burden, and time management were important for investigating the motivation underlying the specialty choices of 154 Korean medical school students. Woodworth et al. [23] reported that medical school students' income affected their specialty choice, especially due to their increased debt; furthermore, Niaz et al. [24] reported that lower incomes increased students' hesitation to choose psychiatry as a specialty in comparison to other specialties. Stoddard et al. [25] reported that income affected doctors' job satisfaction. Therefore, it can be assumed that the attitudinal changes related to income after completion of clinical clerkships are likely to affect medical school students' specialty choices.

Before completing the psychiatry curriculum, students who had not made any decision regarding specialty choice formed the highest percentage of the students, and students who wanted to choose psychiatry formed the second highest group; these findings agreed with those of other domestic studies [6]. Among the 10 people who wanted to apply for psychiatry before implementing the curriculum, six still did after completing the curriculum. Goldenberg et al. [5] reported that the field of psychiatry offered the highest potential for career stability and that the percentage of medical school students was 50%. In this study, 60% of students sustained hopes to specialize in the field of psychiatry.

However, unlike other studies where psychiatry application rates increased after the curriculum was completed, the current study showed a decrease in intended application rate after curriculum completion [1, 5]. Goldenberg et al. [5] suggested that the high rate of competition for popular specialties may have the effect of decreasing application rates over time, which is a possible reason for our study's findings. Further, in the Goldenberg study, 80% of medical school students who applied for the psychiatry specialty

after completing the curriculum had applied for other specialties before completing the curriculum [5]. In our study, only 14.3% (1 student) changed their specialty choice from another specialty to psychiatry. Goldenberg reported that students who changed their specialty choice to psychiatry were most concerned about “the balance of work and life” followed by “psychiatry clerkship rated excellent” [5]. In previous studies, controlling daily life events through time-management affected specialty choice [26], but our study did not evaluate work-life balance.

The rating of the psychiatry clerkship was evaluated using the Balon scale (specific medical school factors), and attitudes toward psychiatry and the psychiatry curriculum were found to be positive overall. Among these questions, the item “Although I am interested in psychiatry, no effort was made to encourage my becoming a psychiatrist at my medical school” received more than 30% agreement responses and a relatively higher proportion of negative perceptions compared to other questions. However, this study did not assess this issue in further depth.

In this study, we identified medical school students’ attitudes toward psychiatry, attitudinal changes after completing the psychiatry curriculum, and specialty choice-related changes before and after completing the curriculum. Our study can help provide better education for medical school students and foster better psychiatrists. Other studies have had similar goals; Yadav et al. [27] suggested that appropriate modifications to the curriculum could help medical school students improve their attitudes toward psychiatry. Chandrasekaran et al. [28] suggested that modifying the curriculum by focusing on a specific attitude could prove helpful for changing students’ attitudes, since it is impossible to change students’ attitudes totally through just the curriculum. Seong et al. [15] proposed to modify the curriculum based on medical school students’ attitudes, especially in relation to those who experienced negative attitudinal changes after completing the clinical clerkship. By identifying medical school students’ biases and stigmas regarding psychiatry, as indicated in our study’s results, and by reviewing the current curriculum and its effects on attitudes, we can correct and supplement the curriculum as required.

Previous studies have shown that some people do hold concerns and negative perceptions regarding psychiatric treatment [29, 30] and that mentally ill patients often receive other treatment before they begin psychiatric treatment. Thus, other specialty doctors’ attitudes and perceptions toward psychiatry and psychiatric patients could affect early diagnosis and proper treatment for psychiatric patients [16]. Therefore, it is essential to provide medical school students who wish to choose some other specialty with the right awareness and attitudes regarding psychiatry by improving the psychiatry curriculum; this can be accomplished by identifying attitudinal changes after completion of the curriculum and classifying them according to the students’ specialty choices. In this way, an appropriate psychiatry curriculum can improve the early diagnosis and treatment of psychiatric patients as well as cooperation with psychiatrists.

This is the first South Korean study to evaluate medical school students’ attitudes toward psychiatry. Unlike other studies, which only evaluated changes in attitudes before and after completion of psychiatry clerkship, this study provides one major advantage—the comparative analysis of attitudinal changes both

before and after a series of curriculum (psychiatry lectures and clerkship) implementations. Furthermore, this study provides another improvement in that the same students were examined (with regard to their attitudinal changes toward psychiatry) as their grades changed.

This study had some limitations, however. First, it is possible that the ceiling effect affected the analysis results. This study categorized survey responses into two types in order to easily identify whether attitudinal changes were positive or negative and to determine how attitudes changed before and after completion of the curriculum. This ceiling effect could be reduced in later studies by assessing students' responses through subdivision. Second, since questions, which are related to the factors of a specific medical school in the Balon scale, can be answered only after completion of the curriculum, the values measured after the completion of the psychiatry lectures and those measured after the clerkship were compared and analyzed. Therefore, medical school students' attitudinal changes could not be evaluated in relation to the questions before and after completion of only the psychiatry lectures. If the questions to evaluate the effects of psychiatry lectures on the medical students' attitude are examined in factors of a specific medical school of a follow-up study, the impact of the psychiatry curriculum on changes in medical students' attitudes toward psychiatry might be clarified. Last, this study's results had low generalizability because they were based on data sourced from a single medical school (the medical school curricula across Korea are not standardized). However, it may be more meaningful to understand students' attitudes and appropriately develop a curriculum based on this study's results rather than focusing too much on some of the above findings; this approach could enable the provision of a better education for medical students if several medical schools conducted follow-up studies. Such studies should incorporate various evaluation items based on previous studies, such as motivation for admission to medical schools, reasons for choosing a specialty, and grades not included in the current study [9–11].

## Abbreviations

Institutional Review Board

IRB; Chi-Squared test:  $\chi^2$ -test; SPSS: Statistical package for the social sciences

## Declarations

### Authors' contributions

HJL : Study design, writing the original manuscript, data acquisition. HJJ, GHW and SJ : Study design, Data acquisition, Data analysis. SHB : Data acquisition, Data curation. SY : Conceptualization, Supervision. TYC : Study design, Conceptualization, Supervision. All authors read and approved the final manuscript.

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### **Availability of data and materials**

The data supporting our findings are available from the corresponding author on reasonable request.

### **Ethics approval and consent to participate**

The study protocol was reviewed and approved by the Institutional Review Board (IRB) of the Daegu Catholic University Medical Center, which waived the need to obtain informed consent from the subjects (CR-19-173). All clinical investigations were conducted according to the principles expressed in the Declaration of Helsinki.

### **Consent for publication**

Not applicable

### **Competing interests**

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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