

# Investigating the Medical Study of Overseas Students at Jinan University Medical School

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## Abstract

A great number of overseas students have studied medicine at Jinan University Medical School over the past decade. Statistics from the past ten years show that these students' test scores on diagnosis and medicine I & II are lower than those of their classmates from mainland China. To address the underlying causes of this phenomenon, we implemented a series of questionnaires for overseas and mainland Chinese medical students. The results indicate that there are no significant differences between overseas students and mainland Chinese students with regard to their attitude towards the study of medicine, their approval of the teaching and learning environments or their ability to improve their independent study capabilities at Jinan University Medical School; however, overseas students prefer to study at night and sleep later than their mainland Chinese classmates. One outstanding difference between these groups is that overseas students like to arrange their studies based on their interests, regardless of available time and subject contents, and this might lead them to perform poorly on examinations during their academic term at Jinan University Medical School. Overseas students might not have achieved scores as high as their Chinese classmates is that they do not completely focus on the content taught by teachers in class, which would later be assessed by exams at the end of each academic term. This observation is actually part of our medical educational concepts, especially in Chinese medical schools. Attention should be paid by both overseas students and medical schools to this discrepancy.

**Keywords:** Overseas students, Medical education in China, Teaching medicine in non-English-speaking countries

## 1. Introduction

Internationalization of higher education in China mainly stems from two impetuses: globalization of higher education and China's economic rise. Although internationalization of modern higher education started from western countries, internationalization has gradually spread to the rest of the globe since the 1990s (Bulajeva & Hogan-Brun 2014, Enders 2004, Vidovich 2002). In the United States of America, the benefits of global health experiences were vast for American medical students, and internationalization could promote American development of structured curricula, which in turn maximize the achievements to the medical students studying now and in the future (Glaser 2012). As we know, millions of Chinese students go abroad to study every year as China's economic development increases. At the same time, more and more overseas students have recently come to study in Chinese universities, including Jinan University Medical School. There is no doubt that this abrupt increase in international medical students dramatically impacts the ecologies of Chinese medical universities' administration and teaching methods, even in private higher education (Shi 2011). The first of this is that the teaching staff was able to deliver their lectures and communicate with overseas students in English, though Chinese has absolutely been the predominant teaching language in Chinese medical schools over the past several decades. As has occurred in many countries around the world, English is becoming a major lingua franca, especially for teaching international medical students in Jinan University Medical School (Bjorkman 2011).

One thing that should be kept in mind is that much more attention should be paid to those overseas students as their

share of the student population in Chinese universities quickly expands. Some of the leading authorities in the higher educational field bring together current research and sound practical advice on the provision of quality teaching and learning for overseas students at nearly 20 years ago, however, their attention was mainly focused on the United Kingdom's education systems (Harris & McNamara 2002). Taiwanese universities have also adopted the development of educational internationalization and have made many advanced policies to attract overseas students to enrol at their universities (Song & Tai 2007). Overseas students run into many problems in both their studies and lives as "sojourners" in China, which should not be overlooked. Although these students might experience maladjustment to Chinese culture/language and life style as sojourners, the principle influencing factors that we focus on here are the study environments and methods in universities. There are more than 1700 registered overseas students in Jinan University International School at moment. They come from Hong Kong, Macao, Taiwan and 73 other countries and study in 7 majors, including medicine.

However, there are few literatures on the overseas students' study in China, although the population of international students has explosively increased in recent years in Chinese universities including Jinan University. Therefore, to improve the effectiveness of the studies of overseas students in Jinan University Medical School, in this study, we carefully compared the exam results of several clinical disciplines between overseas students and mainland Chinese students who registered in the International School over the past decade. Furthermore, we cautiously analysed the reasons that lead to the differences between these two populations of students.

## **2. Methods**

### *2.1 Subjects*

Jinan University has offered medical programmes in English over the past several decades. Jinan University Medical School offers an MBBS (Bachelor of Medical & Bachelor of Surgery) and was registered by the WHO (World Health Organization) of the United Nations in 1984, which allows its medical graduates to directly participate in medical license examinations all over the world. All the medical courses related to MBBS in Jinan University Medical School are taught in English, so that the non-mainland Chinese students are not required to have Chinese language proficiency. These MBBS programmes are designed to train medical students to become qualified clinical specialists with both ethical and intellectual abilities. Students are recruited from abroad, including Hong Kong, Macao and Taiwan and mainland China. Jinan University International School is responsible for recruiting and administrating overseas medical students, while Jinan University Medical School is responsible for teaching and training them during their time in university. The medical education system in China is organized into three parts, including a basic medical science curriculum at the early stage followed by clinical sciences with intermittent clerkship and internships with clinical exposure. The medical students in this study were randomly distributed to training hospitals when they started their clinical practice.

### *2.2 Methods*

Based on the origins of students, the medical students in the International School were divided into two groups. One group is from abroad, including Hong Kong, Macao and Taiwan, while another group is from mainland China.

The effectiveness of students' studies was evaluated by the traditional combination of close-exam test and objective structured clinical examination (OSCE) (Yudkowsky et al. 2006).

The subsequent survey was distributed to randomly selected students (mainland Chinese students: n=43; overseas students: n=52) who answered the questionnaire, which contained 24 questions about their regular timetable, study attitude, etc.

### *2.3 Ethical Considerations*

The study was carried out in accordance with the Declaration of Helsinki. The study was not subject to approval by a Research Ethics Committee because no sensitive or personal health information was involved. The medical student participants were provided with written and oral information about the study and informed that they could withdraw at any time. Confidentiality was assured by keeping the materials de-identified in the transcripts, and the data in this study were only accessible to the authors.

### *2.4 Data Analysis*

The questionnaires were showed in Supplementary Table 1. Kendall's tau B test was used to assess the validity and reliability of each item listed in the questionnaire. Data analyses and statistical chart preparation were performed using the GraphPad Prism 5 software package (Graphpad Software, San Diego, California, USA). The results were presented as the means  $\pm$  standard error (SE). All the data were analysed using Independent-sample T test or

Chi-Square tests. Samples were considered significantly different at  $p < 0.05$  and extremely significantly different at  $p < 0.01$ .

### 3. Results

#### 3.1 The Average Scores of Medical Undergraduates at Jinan University International School did not Significantly Alter over the Past Decade.

First, we collected the undergraduates' scores on diagnostics, medicine I (the first part of medicine) and medicine II (the secondary part of medicine) from all of medical undergraduates in Jinan University International School, in which roughly half of the students come from mainland China and half from overseas. Here, the exam scores were collected from medical students in all academic years in Jinan University International School over the past decade. The average scores were calculated from all of students no matter where they came from. Here, we could see that the general trends of exam results for all of the three disciplines are similar and stable (especially in the most recent 5 years), even though there are some ups and downs over the years (Fig. 1A).

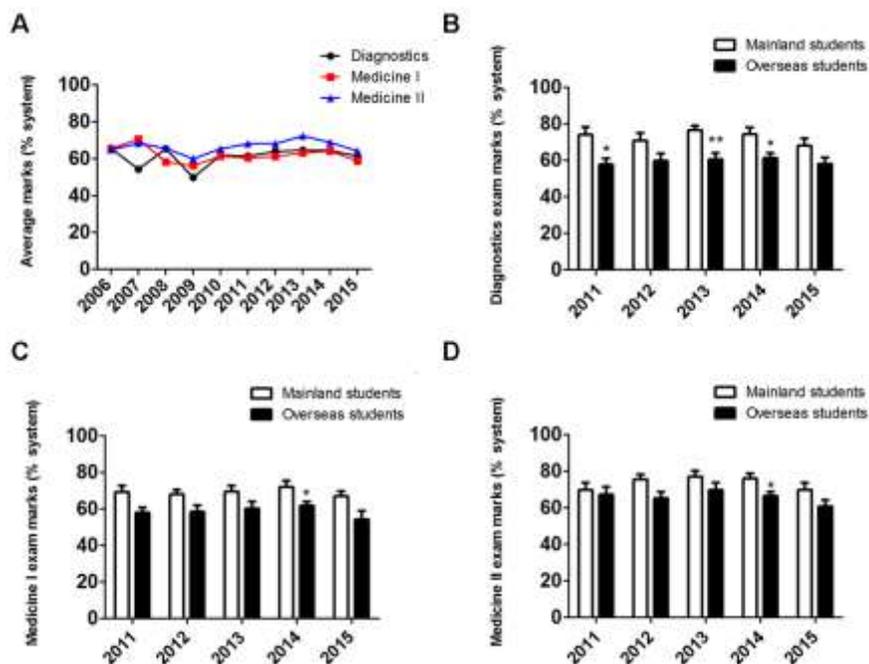


Figure 1. The exam scores of three clinical disciplines from the undergraduates of Jinan University International School.

**A:** The exam scores of Diagnostics, Medicine I and Medicine II were collected from the undergraduates of Jinan University International School in the academic years from 2005 to 2015. Jinan University uses the hundred-percentage system, with 60 percent as the passing grade. **B-D:** The exam scores of diagnostics (B), Medicine I (C) and Medicine II (D) were collected from both mainland Chinese (blank) and international (filled) undergraduates of Jinan University International School in the academic years from 2011 to 2015. Jinan University uses the hundred-percentage system, with 60 percent as the passing grade.

#### 3.2 The Overseas Students Got Lower Scores than Mainland Chinese Students on the Three Clinical Disciplines and Graduation Examination.

To compare learning effectiveness between overseas students and mainland Chinese students, we carefully compared the exam results of diagnostics (Fig. 1B), medicine I (Fig. 1C) and medicine II (Fig. 1D) between both groups of students in the last 5 years. Generally, we saw that the overseas students got lower scores on the three disciplines over the past decade (Figs. 1B-D). There were significant differences on diagnostics exams between overseas students and mainland Chinese students in 2011, 2013 and 2014 ( $p < 0.05$ ; Fig. 1B); on medicine I exams in 2014 ( $p < 0.05$ ; Fig. 1C); and on medicine II exams in 2014 ( $p < 0.05$ ; Fig. 1D).

### 3.3 The Questionnaires Reveal that the Difference is Mainly Because of Students' Learning Methods and Interests rather than the Learning Environments on Campus.

To better understand what causes the differences in learning effectiveness between mainland Chinese students (n=43, 21 male and 23 female students) and overseas students (n=52, 26 male and 26 female students), we implemented a series of questionnaires including their learning environments and interests among the medical students at Jinan University International School. There is no age difference since the average age of both mainland Chinese students and overseas students is about 21 years old (junior student). From the questionnaires, we know that both cohorts of students like to study medicine (Fig. 2A). Both groups think that teaching would be conducive to improving their independent study ability (Fig. 2B). There is not much difference in opinions of the groups about the study conditions on campus (Fig. 2C). The majority of students in both cohorts fully approve of the learning environments at Jinan University (Fig. 2D). Interestingly, overseas students showed a stronger desire to become physicians after graduation than mainland Chinese students ( $p<0.05$ ; Fig. 2E).

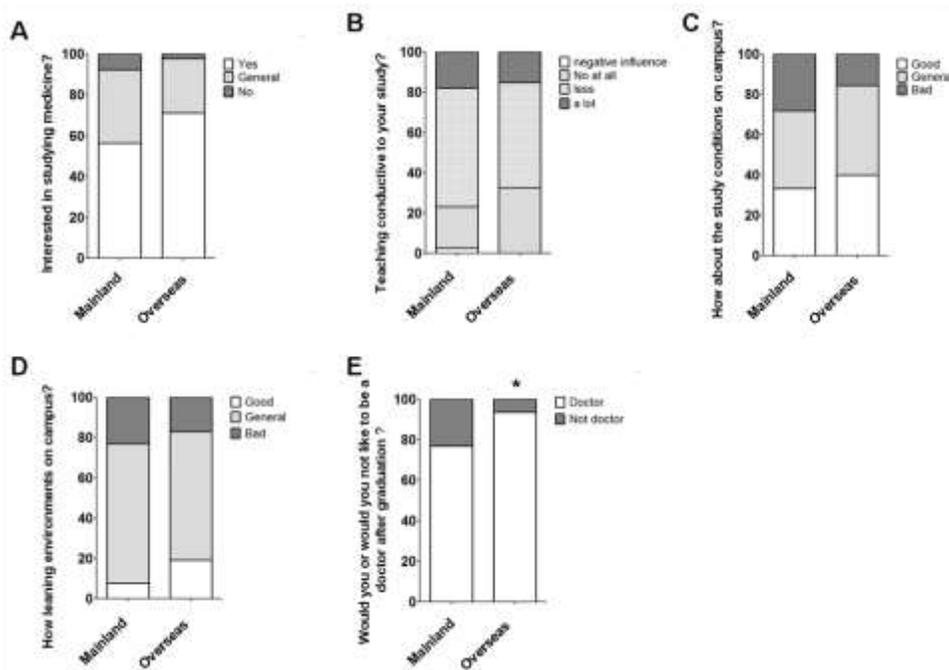


Figure 2. The questionnaire for teaching and learning activities at Jinan University School of Medicine.

The questionnaire was implemented among mainland (n=43) and international (n=52) medical undergraduates of Jinan University International School. **A-E**: The bar charts showing the questionnaire results about the following questions: (A) are you interested in studying medicine? (B) do you think that the teaching is conducive to your study? (C) how about the study conditions on the campus? (D) how about the learning environments on the campus? (E) would you or would you not like to be a doctor after graduation?

In the questionnaires about their school timetables, we find that overseas students prefer to go to bed late in the evening and will get up later if they do not have a class first thing in the morning compared to mainland Chinese students ( $p<0.001$  in Figs. 3A; Figs. 3B). Fewer overseas students have the habit of napping during day time (Fig. 3C), but more overseas students sleep over 8 hours than mainland Chinese students ( $p<0.05$ ; Fig. 3D). There is no difference between the numbers of students who exercise everyday between both cohorts of students (Fig. 3E), and both cohorts get up at almost the same time if there is the first class in the morning (Fig. 3F).

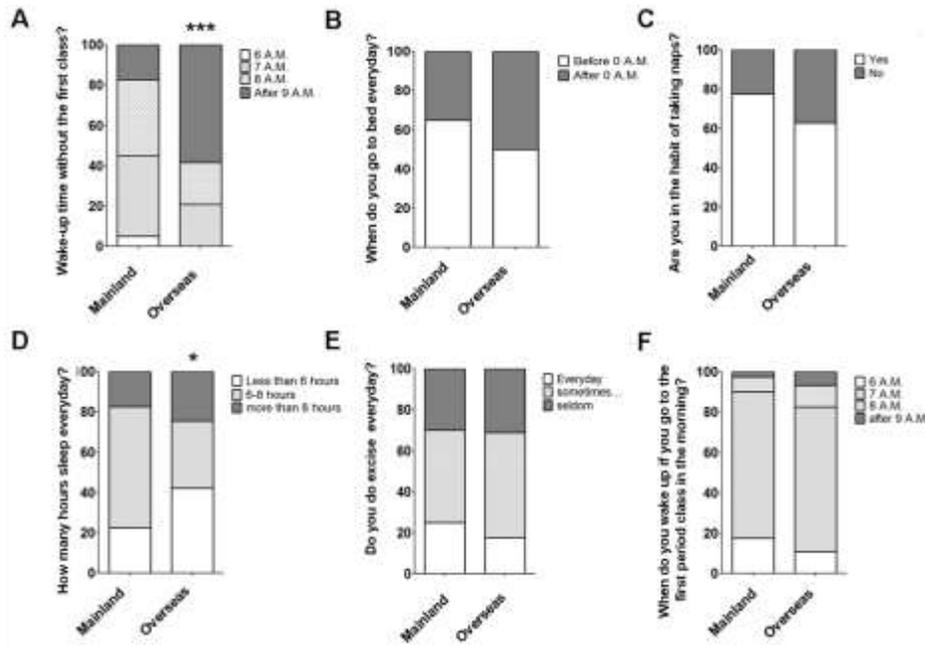


Figure 3. The questionnaire for the quitting time at Jinan University School of Medicine.

The questionnaire was implemented among mainland (n=43) and international (n=52) medical undergraduates of Jinan University International School. **A-F**: The bar charts showing the questionnaire results about the following questions: (A) when do you wake up if there is the first period class in the morning? (B) when do you go to bed every day? (C) are you in the habit of taking naps? (D) how many hours do you sleep normally every day? (E) do you do exercise every day? (F) when do you wake up if you go to the first period class in the morning?

In the questionnaires about the arrangement of study time, the answers indicate that both cohorts of students spend similar amounts of time on self-study everyday (Fig. 4A). In the evening after 6pm is the most common time for self-study across both cohorts of students (Fig. 4B). Interestingly, mainland Chinese students prefer to study during the day time (Figs. 4C-D) rather than at night, while more overseas students choose to study at night compared to mainland Chinese students (Fig. 4D).

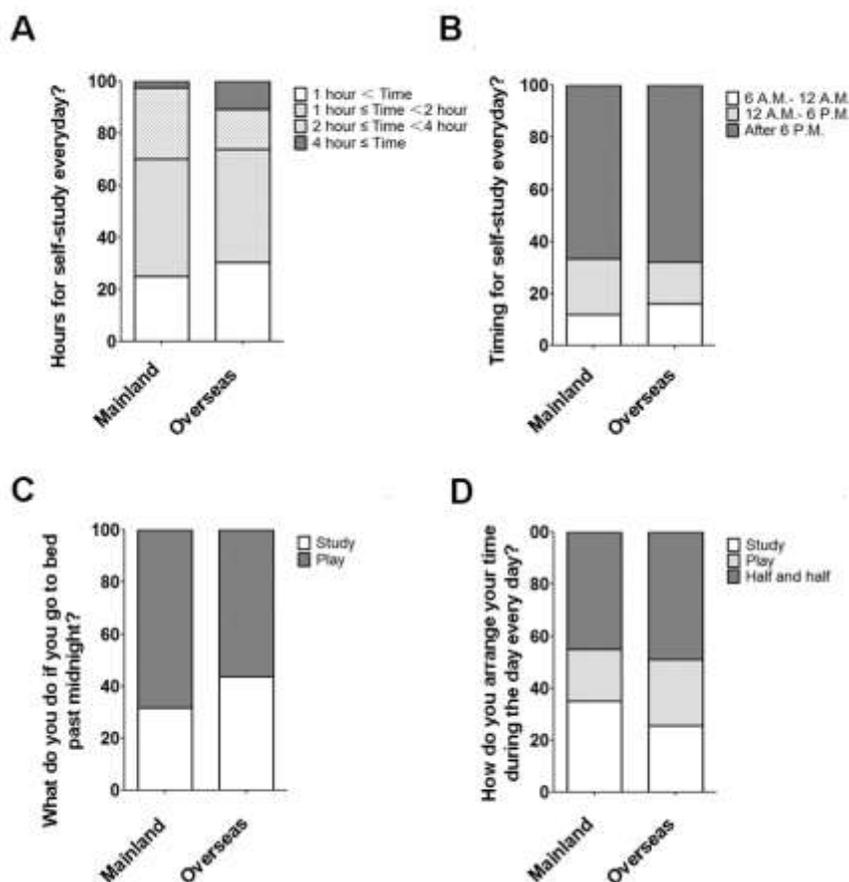


Figure 4. The questionnaire for the individual study at Jinan University School of Medicine.

The questionnaire was implemented among mainland (n=43) and international (n=52) medical undergraduates of Jinan University International School. **A-D**: The bar charts showing the questionnaire results about the following questions: (A) how many hours do you spend on self-study every day? (B) when do you arrange your self-study every day? (C) what do you do if you go to bed past midnight? (D) how do you arrange your time during the day every day?

In the questionnaires about study methods and habits, both mainland Chinese and overseas students thought that independent study is very important (Fig. 5A), and they all consider their independent study ability to have improved while at Jinan University (Fig. 5B). In comparison to mainland Chinese students, overseas students seem to be good at making their own study plans in college (Fig. 5C); however, both cohorts are able to complete their study plans well once made (Fig. 5D). Overseas students appear to be more active in acknowledging hunting (Fig. 5E), and they also choose the contents of their studies more based on their interests compared to mainland Chinese students ( $p < 0.05$ ; Fig. 5F).

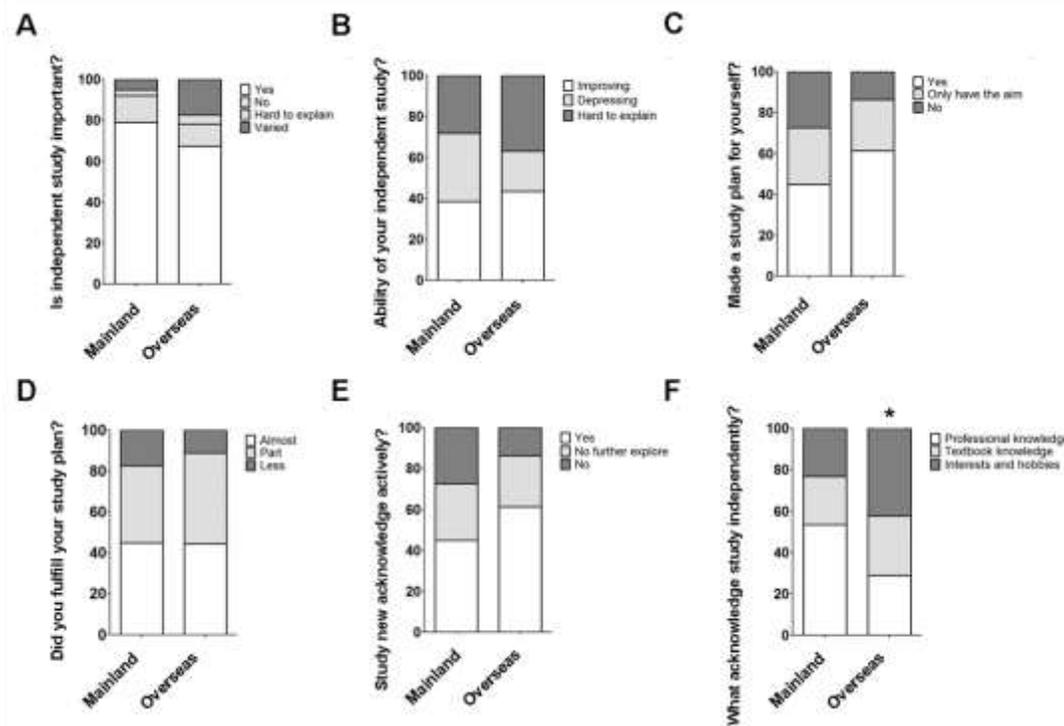


Figure 5. The questionnaire for learning content and preference at Jinan University School of Medicine.

The questionnaire was implemented among mainland (n=43) and international (n=52) medical undergraduates of Jinan University International School. **A-F**: The bar charts showing the questionnaire results about the following questions: (A) do you think that independent study is important? (B) how do you assess your independent study ability? (C) have you ever made a study plan? (D) did you fulfil your study plan if you have? (E) do you actively study new things? (F) what topics do you study independently?

#### 4. Discussion

Interdependence and globalization span the world in all walks of life, including medical education. Over the past hundred years, overseas students have mainly been drawn to western countries and have even impacted the education environment and policy there (Enders 2004, Shah et al. 2011). However, more and more overseas students are now enrolled in Chinese universities, while millions of Chinese students leave for overseas study. There is no doubt that the bilateral effects of globalization have had immense impact on higher education (Vidovich 2002). Modern medicine derives from western countries, so western-style medical education is certainly predominant all over the world (Hawthorne et al. 2004). As a comprehensive university, Jinan University was initially built to house overseas students, which principally used to be the children of overseas Chinese families. Therefore, Jinan University comprises a huge number of overseas students, accounting for roughly half of the current 23,000 full time students. Here, an “international student” is defined as students who come from all regions except for mainland China, including overseas Chinese students from Hong Kong and Macao. Of the overseas students at Jinan University International School, many of them study clinical medicine in English. Thus, the task that our staff in the Medical School has to face is how to ensure the quality of teaching.

Among medical students from the International School, less than half are recruited from mainland China, and over half of them are from overseas, herein referred to as “overseas students”. In the process of teaching medical students at Jinan University International School over the past decade, many staff members have reflected that it is “not easy to teach overseas students”. Here, we reveal that the average scores of overseas students on Diagnostics, Medicine I and Medicine II exams are lower than those of their mainland Chinese classmates over the past decade (Fig. 1). Bhagat et al. reported that negative emotion would negatively impact medical students’ academic scores, whether or not they study at home or overseas (Bhagat et al. 2016). However, our kind of medico-psychological questionnaire shows that overseas students hold an even more positive attitude than mainland Chinese students towards the study of medicine, and they think that the university’s learning environments and conditions are conducive to their study (Fig. 2), indicating that the diversity of academic scores is not due to their study attitude and learning environment.

Overseas students come from various ethnic groups; “internationalization” makes them sojourners in China. The adaptation of overseas students to the institutional experience is often neglected in international education. To assess whether this is because these students arrive somewhere unfamiliar and cannot adapt to the new academic culture, we distributed questionnaires about their resting schedule and lifestyle at Jinan University. From the replies, we could see that these students prefer to study at night and sleep later than mainland Chinese students, but they spend similar amounts of time studying and sleeping, although there is a slight difference in the time tables of these activities (Figs. 3-4). This suggests that acclimatization at Jinan University in China was not vital factor influencing on their academic achievement.

In the last group of questionnaires about self-study ability and study interests, we could see that there is no difference in independent study ability between overseas and mainland Chinese students and both groups could organize and complete their study independently. Overseas students were more likely to choose the contents of their studies based on their interests (Fig. 5). It is noteworthy that there are many lessons in basic sciences and clinical medicine every academic year for each medical student at any Chinese Medical University, so that students have to spend almost all of their time mastering the content taught in class. Otherwise, students’ exam scores might be negatively influenced if they don’t study following a clear step-by-step plan. This is associated with medical education institutions and systems between western countries and Asian countries, in which medical students are required to pass all exams about basic and clinical sciences before national licensing examination and internships, followed by further standardized training (Park et al. 2016). Certainly, the designs of the educational systems in these countries could ensure the effectiveness of cultivating medical students, but these also take a toll on the enthusiasm of medical students at the same time. How to balance the objective requirements of internships and students’ subjective attitudes could be seriously considered as pedagogical implications in the future. Maserà et al analyzed the experience of students from Cameroon studying on the degree courses in Medicine and Surgery and in Nursing at the University of Parma, and they demonstrated that the ideal integration of overseas students was still a difficult problem in education (Maserà et al. 2015). Likewise, the similar issues also existed in the overseas students of Jinan University.

In sum, our questionnaires reveal that the overseas medical students at Jinan University do not have substantial problems with learning attitude or environmental and cultural adaptation, although they do have to fit their living style to local circumstances. One of the important reasons that students might not have achieved scores as high as their Chinese classmates is that they do not completely focus on the content taught by teachers in class, which would later be assessed by exams at the end of each academic term. This observation is actually part of our medical educational concepts, especially in Chinese medical schools. In the further studies, we will compare the learning outcomes of overseas students among different countries (e.g. India, Singapore, and Malaysia) for the challenges of whether or not the international students similarly integrate into new Chinese environments. Furthermore, this preliminary study yields some ideas for the implementation of teaching syllabuses at the Jinan University. What kind of medical internships do we cultivate in the contemporary environment?

## 5. Acknowledgements

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## 6. Competing Interests

The authors declare no competing financial interests.

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