Revision of "Introduction to General Medicine" Based on the Six-Step Curriculum Development Process

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Abstract: *Objective:* Based on the six-step curriculum development process proposed by Professor Schneiderhan *et al*., the course needs, the cognition, and course summative assessment results, combined with the career preferences and work value orientation of clinical medical students undertaking the course "Introduction to General Medicine" were surveyed. *Methods:* A self-designed questionnaire was used to collect information on the course cognition, course summative evaluation, and professional inclination of 233 junior medical students majoring in clinical medicine undertaking the course "Introduction to General Practice." An analysis was conducted to provide a basis for curriculum revision in accordance with the structured composition of the curriculum development process. *Results:* (i) In terms of course cognition, before the course, 67.0% of students were unaware of general medicine and general practitioners, 73.0% of students had never participated in practical activities (including volunteer work), and 53.6% of students expressed interest in the course; there were significant differences in the growth environment, the frequency of participation in club activities, the cognition of general medicine/general practitioners before the course, participation in practical activities (including volunteer work), attentiveness to the current situation of medical treatment, and the interest toward the course ($P < 0.05$); multi-factor logistics analysis showed that the factors influencing the interest toward the course include growth environment, frequency of participation in club activities, course cognition, participation in practical activities, and attentiveness to the current status of development of medical treatment. (ii) The course summative assessment results showed that 91.8% of students felt that it is necessary to learn this course, 33.9% of students felt that the most important thing in the course is to learn the theoretical knowledge of general medicine and related diagnosis and treatment skills, 53.2% of students felt that the most unfavorable factor affecting the learning of this course is the lack of interest in general medicine, and 64.4% of students hoped for more clinical practice to understand and participate in the work of general practitioners; paired *t*-test revealed differences in career preferences before and after the course ($P < 0.05$); after the course, more students thought that general practitioner is an ideal career option. (iii) The results showed that 58.8% of students had considered their future specialty but did not have specific goals or plans, while 21.9% had considered their future specialty and had clear goals; there was a significant difference in professional inclination between genders as well as those who were attentive to the current state and development of medical treatment in our country and those who were not ($P < 0.05$); with regard to the scores of importance in terms of the influencing factors of professional inclination, interest and possibility of professional development scored 3.92, ranking first, followed by income, which scored 3.91, and career prestige, which scored the lowest (3.62). *Conclusion:* Based on the needs assessment of clinical medical students, it is important to focus on improving students' interest in general medicine, especially their cognition and professional understanding of the course before the course itself, in addition to the development of relevant practical activities, and their attentiveness to the current state and development of medical treatment. The summative assessment results suggest that the implementation of this course has a positive influence on the career preferences of clinical medical students to a

certain extent. Therefore, it is necessary to combine the course content with the development of general medicine, so as to stimulate students' interest in self-driven learning and in general medicine. This will attract more students whose work value orientation is influenced by interest and possibility of professional development to choose general practitioner as their future professional inclination.

1. Introduction

At present, the field of general practice in undergraduate medical education is faced with two challenges: (i) how to improve the appeal of general medicine to medical students? and (ii) how to further cultivate and contribute more qualified general practitioners to primary medical care? Therefore, "Introduction to General Medicine" plays a key role as an important course in undergraduate medical education. This paper is based on the six-step curriculum development process proposed by Professor Schneiderhan *et al.* [1], which includes needs assessment, content determination, goal and objective statement, education strategy selection, curriculum implementation, and curriculum evaluation. An investigation of medical students undertaking the course "Introduction to General Practice" was carried out to analyze the course needs, cognitive status, and course summative evaluation results, combined with their professional inclination and work value orientation, for curriculum revision.

2. Data and methods

2.1. Participants

Junior medical students majoring in clinical medicine undertaking the course "Introduction to General Practice" from March to June 2021.

2.2. Research methods

An online questionnaire was designed by referring to existing literature on the network platform, and survey data on course cognition, course summative assessment, and professional inclination of junior medical students undertaking the course were collected. A total of 246 questionnaires were distributed, and 233 were collected; the response rate was 94.7%.

2.3. Statistical analysis

SPSS 22.0 was used to establish the database and input data, and relevant statistical analyses were carried out. Chi-square test and paired *t*-test were used for statistical analysis, and logistics regression was used for multi-factor analysis. The significance level was set to 0.05. The importance of relevant influencing factors on the professional inclination of students was scored on a 5-point scale (1 = not important; 5 = very important), and the average value was taken.

3. Results

3.1. Sociodemographic characteristics

Among the 233 junior medical students majoring in clinical medicine, 84 (36.1%) were male and 149 (63.9%) were female; two (0.9%) of them were 18 years old, three (1.3%) were 19, 53 (22.7%) were 20, 126 (54.1%) were 21, 37 (15.9%) were 22, 11 (4.7%) were 23, and one (0.4%) was 24 years old; 83 (35.6%) had family members or friends practicing as medical specialists (64.4%), while 150 (64.4%) did not; 45 (19.3%) had family members or friends practicing as general practitioners (or primary health care), while 188 (80.7%) did not; in terms of their growth environment, 52 (22.3%) were brought up in urban areas, 82

(35.2%) in town areas, and 99 (42.5%) in rural areas; in terms of the frequency of participation in club activities, 20 students (8.6%) often participated, 94 (40.3%) participated sometimes, 99 students (42.5%) participated occasionally, and 20 (8.6%) had never participated; in terms of the students' attentiveness to our country's status quo of medical development, 183 (78.5%) were attentive, while 50 (21.5%) were not.

3.2. Course cognition

Before the course, 67.0% of students did not know about general medicine and general practitioners, 73.0% had never participated in practical activites (including volunteer work), and 53.6% expressed interest in the course. There were statistically significant differences in the students' interest in the course among different growth environments, frequency of participation in club activities, knowledge of general practice/general practitioner before the course, participation in general practice activities (including volunteer work), and attentiveness to the current state and development of medical treatment ($P < 0.05$). Students who grew up in town and rural areas showed more interest in the course than urban students; students who often or sometimes participated in club activities showed more interest in the course than those who occasionally or had never participated; students who knew about general practice and general practitioners before the course showed more interest in the course than those who did not; students who participated in practical activities (including volunteer work) were more interested in the course than those who did not; students who were attentive to the current state and development of medical treatment in our country were more interested in the course than those who were not (see **Table 1**).

Table 1. Comparison of the level of interest in "Introduction to General Practice" among clinical medical students with different characteristics

Type	Number	Degree of example (n,%)		χ^2	P
		Interested	Not interested		
Growth environment					
Urban area	52	17 (32.7)	35 (67.3)	11.924	0.003
Town area	82	50 (61.0)	32 (39.0)		
Rural area	99	58 (58.6)	41 (41.4)		
Frequency of participation in club activities					
Often	20	14 (70.0)	6 (30.0)		
Sometimes	94	58 (61.7)	36 (38.3)	12.265	0.007
Occasionally	99	48 (48.5)	51 (51.5)		
Never	20	5 (25.0)	15 (75.0)		
Knowledge of general practice/					
general practitioners before the course				19.205	0.000
Yes	77	57 (74.0)	20 (26.0)		
No	156	68 (43.6)	88 (56.4)		
Participated in practical activities (including					
volunteer work)				17.645	0.000
Yes	63	48 (76.2)	15 (23.8)		
No	170	68 (45.3)	88 (54.7)		
Attentive to the current state and development					
of medical treatment in our country				16.841	0.000
Yes	183	111 (60.7)	72 (39.3)		
No	50	14 (28.0)	36 (72.0)		

A multi-factor logistics regression analysis on the interest of students in the course was conducted, with the inclusion of the above factors. The values are shown in **Table 2**.

Table 2. Variable assignment used in logistics regression

Variable	Definition	Scale
Degree of interest	0 = No; 1 = Yes	Classification scale
Growth environment	1 = Urban area	Classification scale
	2 = Town area	
	3 = Rural area	
Frequency of participation in club activities	1 = Often	Classification scale
	2 = Sometimes	
	3 = Occasionally	
	4 = Never	
Knowledge of general practice/general practitioners before the course	1 = Yes	Classification scale
	2 = No	
Participated in practical activities (including volunteer work)	1 = Yes	Classification scale
	2 = No	
Attentive to our country's current state and development of medical treatment	1 = Yes	Classification scale
	2 = No	

The results are shown in **Table 3**. The factors influencing the degree of interest in the course include the growth environment, frequency of participation in club activities, course cognition, participation in practical activities (including volunteer work), and attentiveness to the current state and development of medical treatment.

Table 3. Logistic regression of clinical medical students' interest in "Introduction to General Practice"

Variable	B	SE	Wald	*P*	OR	95% CI
Growth environment						
Urban area					1.000	
Town area	1.505	0.412	13.311	0.000	4.502	2.006–10.104
Rural area	0.175	0.348	0.253	0.615	1.191	0.602–2.354
Frequency of participation in club activities						
Often					1.000	
Sometimes	-1.856	0.822	5.099	0.024	0.156	0.031–0.783
Occasionally	-1.615	0.630	6.583	0.010	0.199	0.058–0.683
Never	-1.360	0.624	4.755	0.029	0.257	0.076–0.871
Knowledge of general practice/general practitioners before the course						
Yes						
No	-1.094	0.353	9.599	0.002	0.335	0.168–0.669

(Continued on next page)

Variable	B	SE	Wald	P	OR	95% CI
Participated in practical activities (including volunteer work)						
Yes						
No	-0.969	0.387	6.280	0.012	0.379	0.178–0.810
Attentive to the country's current state and development of medical treatment						
Yes						
No	-1.174	0.383	9.371	0.002	0.309	0.146–0.656

3.3. Course summative assessment

The results of the course summative assessment were as follows: (i) 91.8% of students said that it is necessary to learn this course; (ii) 33.9% of students felt that the most important thing in the course is to learn the theoretical knowledge of general medicine and related diagnosis and treatment skills; 26.2% learned the concepts and clinical diagnosis and treatment skills that could be used in future learning and work, 28.8% had an understanding of the work content of general practitioners/community health services, 11.2% had a broader vision of medicine and medical career, 53.2% stated that the most unfavorable factor affecting the learning of this course is the lack of interest in the major, 22.7% were not satisfied with the course content, 2.1% were not satisfied with the teachers' professional level, 21.9% were not satisfied with the form of teaching, and 64.4% wished to participate more in community practice to understand and participate in the practical work of general practitioners; (iii) the paired sample *t*-test showed that there were differences in career preferences before and after the course ($P < 0.05$), and more students felt that being a general practitioner is the preferred career option after the course (see **Table 4**).

Table 4. Paired sample *t*-test

	Paired differences					*t*	df	Significance (2-tailed)
	Mean	Standard deviation	Mean standard error	95% CI of the difference				
				Lower	Upper			
Before course-after course	0.129	0.509	0.033	0.063	0.194	3.860	232	0.000

3.4. Professional interest tendency

The results showed that (i) 58.8% of students had considered their future specialty but had no specific goals or plans, 21.9% had considered their future specialty and had clear goals, 0.9% had considered their future specialty and had plans to be a general practitioner, 7.7% had considered their future specialty and had plans to engage in medical-related work outside clinical work (including basic medicine, *etc.*), 0.9% had decided not to engage in medical-related work, and 9.9% had not decided on their future specialty; there was significant difference in professional inclination between different genders as well as those who are attentive to the current state and development of medical treatment in our country and those who are not ($P < 0.05$); (ii) with regard to the scores of importance in terms of the influencing factors of students' professional inclination, interest and possibility of professional development scored 3.92, ranking first, followed by income, which scored 3.91. The scores of intellectual challenges in daily work, work-life balance, long-term doctor-patient relationship, and future work place were 3.65, 3.79, 3.84, and 3.86, respectively. Professional soundness scored the lowest (3.62).

4. Discussion

4.1. Pre-course needs assessment: Focus on improving students' interest in general practice and pay attention to the improvement of students' course cognition, including pre-course professional understanding, the development of relevant practical activities, and awareness of the current status and development of medical treatment in the country

Although many medical colleges and universities have implemented this course as a compulsory course for undergraduate clinical medical students [2,3], aiming at attracting more students to engage in general practice, as a result of the introduction of national policies that emphasize on cultivating talents in general practice as well as encouraging and guiding them, in hope to promote the development of general practice education in our country, the results of this survey showed that 67.0% of students were still unaware about general medicine and general practitioners before the course, and only half of them expressed interest in this course. Our findings are similar to other research conclusions [4]. It is clear that a strong primary healthcare system is more likely to deliver better population health, better health equity, and better use of economic resources than a system oriented toward specialist care and that developing and maintaining a strong and sustainable primary healthcare system requires a significant proportion of medical graduates to support the primary healthcare system. However, attracting a large number of medical students to continuously provide human resource support to this group of practitioners presents a major challenge to the policy formulation and development of general medicine in many countries [5]. Through the pre-course needs assessment, we found that there were differences in interest toward the course ($P < 0.05$) among different growth environments, frequency of participation in community activities, knowledge of general practice/general practitioner before the course, participation in practical activities (including volunteer work), and attentiveness to the current state and development of medical treatment in China. Further multi-factor logistic regression of the above factors showed that the factors influencing the development of interest among clinical medical students in the course include growth environment, frequency of participation in community activities, course cognition, participation in general medical practice, and attentiveness to the current state and development of medical treatment. The higher interest of students brought up in urban and rural areas may also have a more direct relationship with the current policy of rural order-oriented free medical undergraduate talent training. However, this course draws more interest from students who often or sometimes participate in community activities, students who are aware of general medicine and general practitioners before the course, students who have participated in practical activities (including volunteer work), and students who are attentive to the current state and development of medical treatment in our country. This also suggests that before implementing the course, more emphasis should be given to the practical significance of the development of general practice and the progress of the current national medical reform among students; moreover, the course content organically integrated with campus club activities and practical activities (volunteer work), so as to increase the chances of students being in touch with general practice in advance and thus enhance their interest in the course.

4.2. Course summative assessment: The implementation of this course has a positive influence on the career preferences of clinical medical students to a certain extent

General medicine can be divided into two parts: general medicine and monograph. "Introduction to General Medicine" mainly introduces the characteristics, basic concepts, and theories of general medicine, as well as its role in the healthcare system [6]. After the course, 91.8% of students felt that it is necessary to learn this course. The results of the assessment also showed that the course objectives have been achieved. However, half of the students mentioned that the most unfavorable factor affecting the learning of this course is the lack of interest in general medicine. In addition, some students were not satisfied with the course content and form of teaching, and 64.4% wanted to have more community practice teaching in order

to understand and participate in the practical work of general practitioners. This course involves a wide range of theoretical content, and the current arrangement of the course is still dominated by theoretical class hours. In addition, the teachers lack teaching experience, the teaching methods are dominated by traditional teaching methods, and the students do not participate much. This situation is different from that in foreign countries [7], and it is unable to satisfy the full cognition of general medicine. In the revision of the curriculum, there is a need to consider transforming the teaching strategies and exploring new teaching forms [8]. Teachers should pay attention to case collection and combine boring theoretical knowledge and general case practice with more diversified teaching forms, such as situational teaching and role exercise, so as to increase learning opportunities for students and provide them a platform to share their personal views. In self-directed step-by-step learning, students must put themselves in the role of a general practitioner, so as to understand and master the real concept of general practice as well as the responsibility of a general practitioner as the gatekeeper of primary healthcare. In that way, they will be able to develop further interest in general medicine and be more willing to learn new skills [9-12]. The paired t-test showed that there were differences in the results of students' career preferences before and after the course ($P <$ 0.05). After the course, more students felt that being a general practitioner is the ideal career option, indicating that the implementation of this course had a positive influence on the career preferences of clinical medical students to a certain extent and this positive influence should be extended to the above curriculum revision.

4.3. Unclear professional inclination, and work value orientation influenced by interest and possibility of professional development

Our study showed that the students' professional inclination was generally unclear and the influencing factors of students' professional inclination, namely work value orientation, were as follows: interest and possibility of professional development, followed by income, and professional prestige as the least important. Therefore, it is necessary to combine the course content with the development of general medicine, so as to stimulate the self-driven learning interest of medical students and their interest in general medicine. This will attract more students whose work value orientation is influenced by interest and possibility of professional development to choose general practitioner as their future professional inclination.

The revision of this course should be based on the current professional development situation of general medicine, the gradual improvement of the course content, the formulation of course goals and objectives, the selection of education strategies conducive to the course, and the continuous evaluation of the course to ensure continuous improvement. In this way, we can ensure its appeal to students. Other than that, students' interest in self-directed learning will be better stimulated, and they will be more willing to pursue professional development through course learning, thus supplying more talents to the team of general practitioners in China [13-15].

Disclosure statement

The authors declare no conflict of interest.

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