

The Development of Training Curriculum for Enhancing Leadership of Standardized Training Resident Physicians in Guangxi Province, People's Republic of China

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Abstract

Leadership is a core competency in the roles and responsibilities of physicians. Physician leadership is essential for the advancement of global medicine. Research on leadership among Chinese resident physicians is still in its early stages, and the overall level of leadership among Chinese physicians is not high, Chinese physician leadership faces challenges. There has been a lack of corresponding research and a universally accepted curriculum system in the past, which is a critical and core issue that needs to be addressed to enhance the leadership of resident physicians.

The objective of this research was to improve the leadership knowledge level of standardized training resident physicians in Guangxi Province through the implementation of the developed leadership training curriculum. The survey sample consisted of 336 Standardized Training Resident Physicians from six hospitals. The implementation sample consisted of 30 standardized training resident physicians, selected through purposive sampling. Research tools included literature content analysis, questionnaires, pre-tests and post-tests, expert evaluation forms, and satisfaction surveys. Quantitative data were analyzed using percentage, mean, standard deviation and t-test. Qualitative data were analyzed using content analysis.

The results indicated that the overall leadership level of standardized training resident physicians in Guangxi Province, People's Republic of China, was at a moderate level. The training curriculum to enhance the leadership of standardized training resident physicians in Guangxi Province was developed and designed, including two modules: Communication and cooperation ability, and management ability. Leadership knowledge and ability levels were assessed by post-training and showed a significant increase compared to pre-training, with statistically significant differences at .01 level. The overall satisfaction survey for the leadership training curriculum was at the highest level. Five experts evaluated the training curriculum, with results showing the highest levels of utility, feasibility, and propriety, and a relatively high level of accuracy, with the highest average for feasibility.

Conclusion: At present, the overall leadership level of standardized training residents physicians in Guangxi is at a moderate level, and the main shortcoming lies in the low level of communication and cooperation ability and management ability; Designed and developed leadership training curriculum in Guangxi Province, China, with strong utility, feasibility and propriety; The leadership training curriculum has the highest overall satisfaction; 5 Experts generally believe that the training curriculum is highly utility, feasibility, propriety and accuracy, and can be used and further promoted.

Keywords: Leadership; Standardized training resident physicians; Curriculum development; Communication and cooperation ability, and Management ability

Introduction

Standardized training for resident physicians is the most crucial form of postgraduate medical education, serving as the essential path for clinical medicine graduates to become qualified clinical physicians. It is also the most effective way to promote the homogenization of global medical education. The Global Standards for Postgraduate Medical Education provide detailed requirements related to leadership, including collaboration in multidisciplinary teams, decision-making and problem-solving abilities, ethics, and professional behavior. These standards encompass training in management and leadership, management skills, and enhancing teamwork and communication skills to develop medical professionals with effective management and leadership abilities for future clinical practice (Baohong, 2006: 35). The Institute of Medicine (IOM) and the Accreditation Council for Graduate Medical Education (ACGME) in the United States have identified six core competencies that resident physicians must possess (Swing, 2007: 648), including Practice-based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, and Systems-based Practice. These three core competencies are also fundamental to leadership. The focus of evaluating the quality of resident physician training has shifted from checking learning progress to competency assessment.

The Royal College of Physicians and Surgeons of Canada, in "Its 2005 Can MEDS Framework", describes seven roles of competency, including medical experts and scholars, as well as communicators, collaborators, and leaders (Royal College of Physicians and Surgeons of Canada, 2019). These two models provide a reference for the setting of physician competency standards and competency research in many countries and regions.

The WFME (World Federation for Medical Education) standards for postgraduate medical education certification have already been reflected and integrated into the current evaluation criteria for standardized training bases in China. In 1993, the Ministry of Health issued the "Notice on the Implementation of the Pilot Program for Standardized Training of Clinical Resident Physicians" (China Ministry of Health, 1993:1). In December 2013, the National Health and Family Planning Commission of China, in collaboration with seven other departments including education, finance, and human resources, formulated and issued the "Guiding Opinions on Establishing the Standardized Training System for Resident Physicians." In 2014, the National Health and Family Planning Commission officially released the "Guiding Opinions on Establishing the Standardized Training System for Resident Physicians" (General Office of the National Health and Family Planning Commission, 2014: 1). The comprehensive implementation of the standardized training for resident physicians began nationwide in 2015, covering all 31 provinces (regions, municipalities), and the expected goals were successfully achieved.

The concept of leadership in the standardized training of resident physicians in China was reflected in the "Standardized Training Content and Standards for Resident Physicians (Trial)" issued in 2014, focusing on the cultivation of professional ethics, professional abilities, interpersonal communication, and teamwork skills. In September 2020, the General Office of the State Council of China issued the "Guiding Opinions on Accelerating the Innovative Development of Medical Education" (Guobanfa, 2020; General Office of the State Council,

2020: 1), which calls for comprehensively improving the quality of talent training. Leadership education for resident physicians is an essential guarantee for achieving this innovative healthcare system reform and for comprehensively improving the quality of talent training. Leadership is a crucial capability required of doctors in the modern healthcare industry. Although the importance of leadership in the medical field has been widely acknowledged, research on the leadership of standardized training resident physicians in China is still in its early stages, with relatively few related theoretical and empirical studies. Most research methods used are qualitative, with fewer quantitative studies (Jia, 2021: 923). There is a lack of in-depth research on the current status of leadership among resident physicians in China, the overall level of leadership, influencing factors, and development models. Preliminary research results have indicated some issues in the cultivation of leadership among Chinese resident physicians (Luo, 2016: 478), such as the generally low level of leadership, the absence of universally accepted training goals and content, and the lack of effective leadership training curricula and methods.

Resident physicians primarily undertake the fundamental medical work in hospitals, and the quality of their training is directly related to the hospital's sustainable development capabilities. Enhancing the leadership of standardized training resident physicians in China is of significant importance to the development of the medical system and the medical profession (Chen, 2022: 440). How to improve the quality of resident physician training has become a focal point of industry attention and consideration. As China's medical system continues to develop and reform, the cultivation and development of medical leadership have become an urgent task. Therefore, it is essential to develop educational curricula and conduct related research to enhance the leadership of standardized training resident physicians in China. Developing curriculum to improve the leadership of standardized training resident physicians in China holds significant and profound implications for various aspects. These include enhancing the comprehensive qualities and professional abilities of resident physicians and the entire medical workforce, cultivating more next-generation leaders in the medical field, improving the quality of medical services, optimizing the operational efficiency of medical institutions, promoting the reform of medical education towards a more integrated and diversified direction, and providing references for policy-making.

The above contents are summarized: Firstly, leadership is a core competency in the roles and responsibilities of physicians; physician leadership is essential for the advancement of global medicine. Secondly, research on leadership among Chinese resident physicians is still in its early stages, and the overall level of leadership among Chinese physicians is not high, Chinese physician leadership faces challenges. Thirdly, Chinese national healthcare policies support the development of physician leadership. The Chinese state has issued a number of documents emphasizing that on the basis of professional ability; doctors should also cultivate their interpersonal skills and teamwork skills. Finally, enhancing the leadership training of standardized training resident physicians is the most important way to improve the overall leadership level of physicians. Standardized residency training is the most important form of postgraduate medical education, and the global standards for postgraduate medical education include management and leadership development.

There has been a lack of corresponding research and a universally accepted curriculum system in the past, which is a critical and core issue that needs to be addressed to enhance the leadership of resident physicians. Therefore, this study will assess the overall current leadership status of standardized training resident physicians in Guangxi Province, China, and develop a curriculum to enhance their leadership. This will answer the key question of "how to cultivate leadership among resident physicians" in the context of improving the leadership of standardized training resident physicians in People's Republic of China.

Research Objectives

The objective of this research was to improve the leadership knowledge level of standardized training resident physicians in Guangxi Province of People's Republic of China through the implementation of the developed leadership training curriculum.

Research Methods

This study is divided into five aspects:

1. Reviewing the Related Literature

The researcher studied the documents, academic textbooks and previous studies related to the leadership of standardized training resident physicians in Guangxi Province, People's Republic of China both in domestics and overseas.

Research Instrument: The research instrument in this step was the documentary analysis form which includes the content summary.

Data Collection: The data were collected through the documents, academic textbooks and related research works from various higher education institution libraries and educational institutions in China and online data bases.

Data Analysis: The collected data were analyzed by using content analysis technique.

2. Studying the Current Situations

The set of questionnaires was used to collect the current situations in the leadership of standardized training resident physicians in Guangxi Province, People's Republic of China in overall. The details of research method were followings:

Population and samples: The population included 2,100 standardized training resident physicians from 6 hospitals in Nanning City, Guangxi Province, People's Republic of China. The samples for this research were 336 standardized training resident physicians from 6 hospitals. They were selected by using the table of Yamane with the confidence of 95%, stratified random sampling and simple random sampling, respectively.

Research Instrument: It was a set of questionnaires asking about the current situations of the leadership of standardized training resident physicians in Guangxi Province, People's Republic of China. The questionnaire was divided into 3 parts as follows: Part 1 - General information about the respondents; Part 2 - The survey project on the current status of leadership level includes 46 items in 6 dimensions: communication and cooperation ability, comprehensive personal qualities, inspiring influence, ethics and professionalism, management ability, and expertise and technology; Part 3 - Problems and recommendations; Part 3 includes 7 questions. The questionnaire was examined the validity by the five experts. After that, the researcher analyzed the Index of Item-Objective Congruence (IOC). It showed that the IOC value was 0.95.

Data Collection: The researcher sent the letter issued by the Graduate School asking for permission to collect the data. The researcher collected all data by herself.

Data Analysis: The quantitative data from the rating scale questionnaire were analyzed by using mean and standard deviation. The researcher determined the opinion meanings of each five rating scale. The qualitative data were analyzed by content analysis.

3. Interviewing the Relevant Stakeholders

Population and samples: The target group included 6 stakeholders related to the leadership of standardized training resident physicians from six hospitals. They were selected by using purposive sampling technique. They were classified into two groups: 1) two hospital directors, one deputy hospital director and Dean of Medicine Faculty, totally 4 persons, and 2) two lecturers from Faculty of Medicine.

Research Instrument: The semi-structured interview asking for designing and developing the training curriculum, the revised interview questions were verified by the 5 experts to find out the IOC value. The items which have the value of IOC between 0.60 – 1.00 were chosen. It indicated that the IOC value was 0.95

Data Collection: The researcher informally made an appointment with the stakeholders for interview. The researcher interviewed the stakeholders with the time and dates via online. Each individual interview lasted 30-60 minutes. Each interview was recorded to ensure that all the information was recorded and could be reviewed afterwards.

Data Analysis: The obtained data from the interview were analyzed by using content analysis technique.

4. Implementing the Developed Training Curriculum

Population and samples: The target group consisted of 30 standardized training resident physicians who work in Minzu Hospital of Guangxi Zhuang Autonomous in Nanning City, Guangxi Province, People's Republic of China. They involved in this study on volunteering basis.

Research Instruments: The instruments included the training curriculum for enhancing the leadership of standardized training resident physicians, the test (as pre-test and post-test) and leadership evaluation form of the leadership of standardized training resident physicians. The results show that the IOC value was 1.00.

Data Collection: The target group did the 40 questions as pre-test related to the leadership of standardized training resident physicians before the training program about one hour, then the target group were trained about 10 days, after that they did the post-test.

Data Analysis: The test scores were calculated to find out the mean and standard deviation. In addition, dependent samples t-test was used to compare between the test mean scores before and after the training program to detect a significant different set at .01 level.

5. Evaluating the Satisfaction towards the Developed Training Curriculum

Population and samples: The target group included 30 standardized training resident physicians who work in Minzu Hospital of Guangxi Zhuang Autonomous in Nanning City, Guangxi province, People's Republic of China. They involved in this study on volunteering basis.

Research Instrument: The satisfaction questionnaire towards the training curriculum including 3 parts as follows: Part 1 - General information about the respondents which in the form of checklist; Part 2 - The specific content of satisfaction survey includes 17 items: 8 items of curriculum contents, 5 items of training methods and effects, 2 items of training teachers

and materials, and 2 items of training modules; Part 3 - Problem states and recommendations. It showed that the IOC value between 0.60.

Data Collection: The researcher collected the data from the target group by using the satisfaction questionnaire towards the developed training curriculum.

Data Analysis: The quantitative data from the questionnaire were analyzed by using mean and standard deviation. The researcher determined the satisfaction meanings of each five rating scale. The qualitative data were analyzed by content analysis.

6. The Research Conceptual Framework

The conceptual framework of this research is as follows:

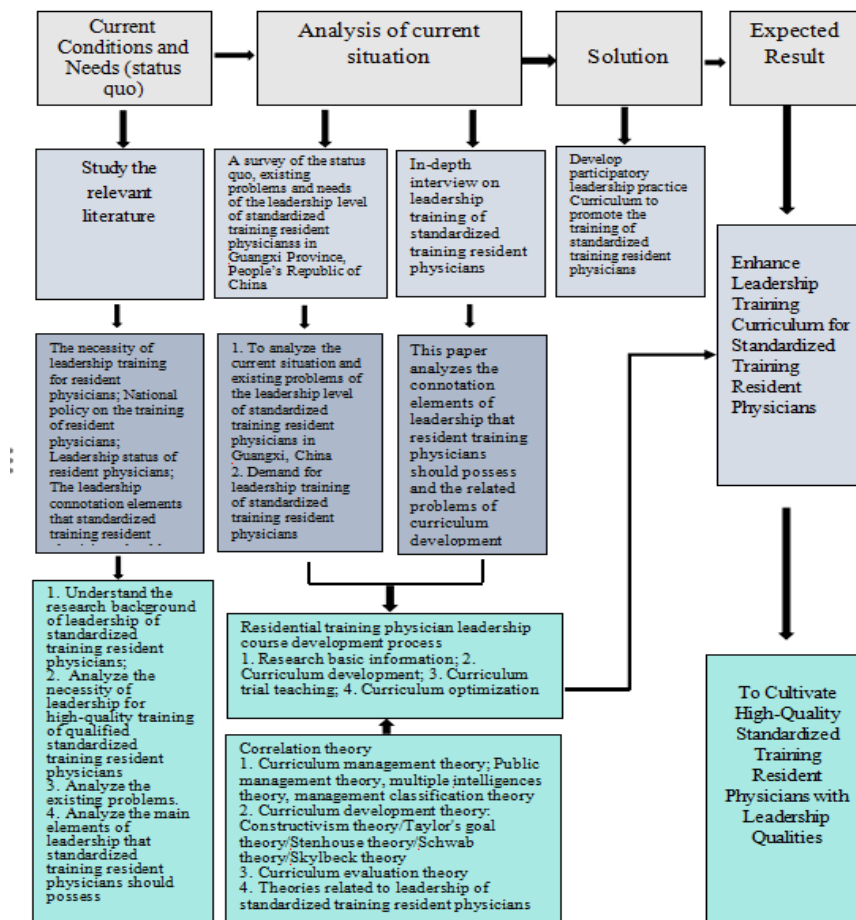


Figure 1: The Research Framework of Development of Training Curriculum for Enhancing the Leadership of Standardized Training Resident Physicians in Guangxi Province of People's Republic of China

Research Results

1. The Current Status and Related Needs on Leadership Standardized Training Resident Physicians

The current status and related needs on leadership of standardized training resident physicians in Guangxi Province, People's Republic of China are shown in Table 1 below.

Table 1 Overall level of leadership among standardized training resident physicians in Guangxi Province, People's Republic of China

Leadership Dimensions	n	\bar{X}	S.D.	Level	Rank
1. Communication and cooperation ability	336	2.44	0.86	Low	6
2. Comprehensive personal quality	336	3.51	0.89	High	2
3. Inspiring influence	336	3.18	0.84	Moderate	4
4. Ethics and professionalism	336	3.54	0.87	High	1
5. Management ability	336	2.60	0.66	Moderate	5
6. Expertise and technology	336	3.34	0.82	Moderate	3
Total	336	3.10	0.77	Moderate	

According to Table 4.2, the research findings indicate that the overall leadership level among standardized training resident physicians in Guangxi Province was at a moderate level. Among six dimensions, two dimensions, namely comprehensive personal quality and ethics and professionalism were at a high level. The dimension of inspiring influence, management ability, and expertise and technology were at a moderate level. The dimension of communication and cooperation ability was at a low level. Among these, the dimension with the highest mean score was ethics and professionalism, followed by comprehensive personal quality. In contrast, the dimension with the lowest mean score was communication and cooperation ability, followed by management ability, which are slightly below average. The above results indicate a deficiency in communication and cooperation ability, and management ability among standardized training resident physicians in Guangxi Province, People's Republic of China. Based on this, the researcher has chosen the two lowest dimensions, namely communication and cooperation ability, and management ability, to be the main training contents for enhancing the leadership of standardized training resident physicians in Guangxi Province, People's Republic of China.

The researcher gained further insights into the training needs for the leadership enhancement of standardized training resident physicians from the seven questions as summarized below:

Over 80% of respondents cited inadequate theoretical knowledge of leadership and limited opportunities for leadership practice as major concerns. To address these issues, recommendations were made to establish leadership training curriculums for standardized training resident physicians, provide practical leadership opportunities.

Regarding learning contents, with over 80% of respondents indicating communication and cooperation ability, and management ability are as the most crucial areas.

In terms of training methods and modalities, respondents favored case sharing, role-playing exercises, and specialized lectures.

Concerning training duration, 69% of respondents deemed 10 days as the most suitable duration.

2. Developing the Training Curriculum for Enhancing the Leadership of Standardized Training Resident Physicians

The researcher synthesized the relevant content of the curriculum for enhancing the leadership of standardized training resident physicians by studying theories and expert interviews, designed and developed the training curriculum for enhancing the leadership of standardized training resident physicians in Guangxi Province, People's Republic of China. It included two modules: communication and cooperation ability, and management ability. Each module was used to train for 5 days, totally 10 days. The training curriculum comprised both theoretical learning and practical exercises.

Module 1: Communication and Cooperation Ability includes 5 aspects, namely 1) Medical ethics/ professionalism, 2) Core communication skills, 3) Taking medical history, 4) Formulating mutual consent, and 5) Communicating in special situations - delivering bad news.

Module 2 Management Ability includes 3 aspects, namely 1) Risk management ability, 2) Crisis management ability, and 3) Decision-making ability.

3. Results of the Training Curriculum Implementation

Following a 10-day learning and training period, the researcher conducted pre- and post-training tests on leadership knowledge and ability levels. Additionally, leadership level tracking surveys and evaluations were conducted at 4 weeks post-training. The research processes are as follows:

3.1 Pre- and Post-training Leadership Knowledge Evaluation

Pre- and post-training evaluations of leadership knowledge were conducted for two modules, with each module scored out of 100 points. Two modules of leadership knowledge evaluation were conducted before and after the training. The results are shown in Table 2.

Table 2: Comparison of test mean scores before and after training for Module 1: Communication and cooperation ability, and Module 2: Management ability

Modules	Pre-Test		Post-Test		t	p-value
	\bar{X}	S.D	\bar{X}	S.D		
Module 1: Communication and cooperation ability test	55.17	14.89	91.83	7.01	18.37	0.000**
Module 2: Management ability test	48.83	11.65	86.67	8.02	26.06	0.000**
Total scores for Modules 1 and 2	104.00	21.99	178.50	11.00	25.87	0.000**

** statistically significant difference at .01

As shown in Table 2, it was found that the results of the training curriculum implementation showed that the leadership knowledge of standardized training resident physicians was statistical significantly higher than after the training of Module 1: Communication and cooperation ability and Module 2: Management ability at the level of .01. That means the developed training curriculum is effective and feasible.

3.2 Post-training Leadership Level Tracking Survey and Evaluation

These evaluations were completed by evaluation teams composed of training instructors. The results are as follows (Table3, Table 4)

Table 3 Dynamic evaluation of Communication and cooperation ability in standardized training resident physicians

Item		Pre-training		Week 4 Post-training		t	p-value
		\bar{X}	S.D	\bar{X}	S.D		
Communication Ability	1	2.37	1.10	4.57	0.50	-9.973	0.00**
	2	2.77	1.25	3.90	0.89	-4.052	0.00**
	3	2.37	1.13	4.67	0.61	-9.83	0.00**
	4	2.43	1.17	4.23	0.94	-6.599	0.00**
	5	2.27	0.98	4.27	0.98	-7.902	0.00**
	Total ¹	2.44	0.42	4.33	0.35	-7.468	0.00**
Cooperation Ability	6	2.70	1.32	4.13	0.86	-4.991	0.00**
	7	2.73	1.08	4.53	0.68	-7.717	0.00**
	8	2.30	1.15	4.23	0.73	-7.784	0.00**
	9	2.33	1.16	4.13	0.63	-7.498	0.00**
	10	2.77	1.31	4.27	0.69	-5.564	0.00**
Total ²		2.57	0.57	4.26	0.48	-6.875	0.00**
Total		2.50	0.35	4.29	0.35	-7.0851	0.00**

Table 4 Dynamic evaluation of Management Ability Before and After Training

Item	Pre-training		Week 4 Post-training		t	Sig
	\bar{X}	S.D	\bar{X}	S.D		
Risk management ability	2.72	0.10	4.56	0.13	-63.286	0.00**
Crisis management ability	2.37	0.14	4.21	0.17	-36.226	0.00**
Decision-making ability	2.76	0.24	4.21	0.17	-27.174	0.00**
Total	2.73	0.08	4.33	0.12	-61.184	0.00**

The results showed that the leadership knowledge and leadership level of resident training doctors were significantly higher after the training of module 1 communication and cooperation ability and module 2 management ability, and the training was effective and feasible.

3.3 Evaluation of the Developed Training Curriculum

This evaluation includes satisfaction evaluation from the standardized training resident physicians who underwent the training and expert evaluation.

3.3.1 Evaluating the Satisfaction towards the Training Curriculum

Following the completion of the curriculum training, the researcher conducted a satisfaction evaluation towards the training curriculum of the standardized training resident physicians in the first week after the curriculum. The evaluation results are shown in Table 5.

Table 5 Satisfaction evaluation results of the standardized training resident physician leadership training curriculum (n=30)

Items	Content	Satisfaction		
		\bar{x}	SD	Level
Curriculum Content	Communication and cooperation ability Curriculum introduction	4.53	0.57	Highest
	Establish a harmonious relationship with patients	4.57	0.50	Highest
	Take medical history	4.63	0.56	Highest
	Explain the problem and agree on goals with the patient	4.63	0.49	Highest
	Break the news	4.47	0.63	High
	Risk management ability training content	4.50	0.57	High
	Crisis management ability training content	4.47	0.51	High
	Decision-making ability training content	4.50	0.57	High
	Total ¹	4.54	0.55	Highest
Training Methods and Efficiency	You are satisfied with the training method of this training	4.50	0.51	Highest
	You think this training is helpful to your leadership development	4.52	0.57	Highest
	Apply knowledge and abilities to clinical practice	4.47	0.51	High
	You think this training can help and guide clinical work	4.67	0.48	Highest
	Can promote their management ability and leadership improvement	4.40	0.56	High
	Total ²	4.51	0.53	Highest
Trainers and Materials	Your satisfaction with the teachers (lecturers, teaching assistants, etc.) in this training	4.60	0.50	Highest
	The Curriculumware, cases and materials provided by this training are sufficient and practical	4.67	0.55	Highest
	Total ³	4.63	0.52	Highest
Training Modules	Your satisfaction with the communication and cooperation training module	4.63	0.49	Highest
	Your satisfaction with the management competency training module	4.57	0.50	Highest
	Total ⁴	4.60	0.49	Highest
Total		4.55	0.53	Highest

As shown in Table 5, it was found that the overall satisfaction towards the developed training curriculum of the standardized training resident physicians was at the highest level. The highest mean score was trainers and materials, followed by training modules, curriculum contents, and training methods and efficiency, respectively.

3.3.2 Validating the Developed Training Curriculum

Five experts from various fields including clinical medicine, medical education, sociology, and educational administration were asked to evaluate the utility,

feasibility, propriety and accuracy of the developed leadership curriculums for standardized training resident physicians. The evaluation results are shown in Table 6.

Table 6 Evaluation results of experts on leadership training curriculum

Item	Utility			Feasibility			Propriety			Accuracy		
	\bar{X}	S.D	level	\bar{X}	S.D	level	\bar{X}	S.D	level	\bar{X}	S.D	level
1. Curriculum Objectives	4.60	0.55	Highest	4.80	0.45	Highest	4.60	0.55	Highest	4.60	0.55	Highest
2. Curriculum Contents	4.80	0.45	Highest	4.60	0.55	Highest	4.80	0.45	Highest	4.40	0.55	Highest
3. Teaching Methods	4.80	0.45	Highest	4.80	0.45	Highest	4.60	0.55	Highest	5.00	0.00	Highest
4. Teaching Resources	4.80	0.45	Highest	4.80	0.45	Highest	4.20	1.10	High	4.80	0.45	Highest
5. Trainer Qualifications	4.80	0.45	Highest	4.80	0.45	Highest	4.40	0.55	High	4.60	0.55	Highest
6. Teaching Cases	4.60	0.55	Highest	4.80	0.45	Highest	4.40	0.55	High	4.60	0.55	Highest
7. Appropriateness of Training Input and Output Ratio	4.80	0.45	Highest	4.60	0.55	Highest	4.60	0.55	Highest	3.80	0.84	High
8. Curriculum Design	4.80	0.45	Highest	4.80	0.45	Highest	4.40	0.55	High	4.60	0.55	Highest
9. Curriculum Evaluation and Feedback Mechanism	4.60	0.55	Highest	4.80	0.45	Highest	4.40	0.55	High	4.20	0.84	High
10. Reasonableness of Training Schedule	4.80	0.45	Highest	4.60	0.55	Highest	4.82	0.45	Highest	4.40	0.89	High
11. Training Venue and Facilities	4.60	0.55	Highest	4.80	0.45	Highest	4.60	0.55	Highest	4.40	0.89	High
Total	4.73	0.45	Highest	4.75	0.44	Highest	4.53	0.57	Highest	4.49	0.66	High

According to Table 6, the evaluation results of the quality of the training curriculum validated by the five experts indicate that the utility ($\bar{X} = 4.73$, S.D. = 0.45), the feasibility ($\bar{X} = 4.75$, S.D. = 0.445), and the propriety ($\bar{X} = 4.53$, S.D. = 0.575) were all at the highest level, while the accuracy ($\bar{X} = 4.49$, S.D. = 0.665) was at a relatively high level, with feasibility having the highest mean score. It is evident that the curriculum design has received unanimous praise from the five experts, who generally consider it to have high utility, feasibility, propriety and accuracy.

Discussion

The discussion regarding the four issues addressed in this research topic is as follows:

1. The Current Status and Relevant Needs of Leadership among Standardized Training Resident Physicians

Based on the survey findings, the overall leadership level among standardized training resident physicians in Guangxi Province, People's Republic of China, was at a moderate level. The survey results of this study indicated that the communication and cooperation ability and management ability of standardized training resident physicians do not match clinical needs. Therefore, communication and cooperation ability and management ability should be emphasized in the leadership training of standardized training resident physicians. How to communicate and cooperate with patients and teams, demonstrate leadership in crises, handle conflicts and crises correctly, manage teams well, and achieve efficient diagnosis and treatment and safe medical care are components of the curriculum that standardized training resident physicians need to further study and train. This provides a clear direction for the design of the leadership training curriculum for standardized training resident physicians in Guangxi Province, People's Republic of China.

The researcher designed the curriculum based on the current status and needs of leadership among standardized training resident physicians in Guangxi Province and determined the objectives, design plans, explanations, implementations, inspections, evaluations, feedback, and rebuilding, which conforms to the curriculum development situational model proposed by Skilbeck (Guo, 1998: 67) and Jin Yule (Jin, 2012: 155), also known as the environmental model or cultural analysis model, situational analysis model. They mentioned that the curriculum must have a broad theoretical foundation to balance between students, society, and knowledge. Emphasis is placed on analyzing and evaluating the curriculum design and development according to different environmental realities, and solving curriculum development problems in real contexts. This study comprehensively analyzed the reality of leadership education among standardized training resident physicians in Guangxi Province through methods such as questionnaire surveys, observation, and interviews to identify deficiencies and issues, and fully analyzed the reality of leadership education among standardized training resident physicians, thus determining the curriculum objectives of the leadership training curriculum for standardized training resident physicians in Guangxi Province. This fully reflects the theoretical thinking of the situational model.

2. Development of Leadership Enhancement Curriculum for Resident Physicians

Based on the survey results, the core elements of leadership that are most lacking among resident physicians were communication and cooperation ability, as well as management ability. Consequently, the researcher developed key curriculum to enhance the leadership of resident physicians in Guangxi Province, People's Republic of China, including Module 1: Communication and Cooperation ability Training and Module 2: Management ability Training.

The design and development of these two curriculum modules were based on four elements: curriculum objectives, curriculum content, curriculum implementation, and curriculum evaluation, in accordance with the principles proposed by Tyler (1949: 112-130), which delineate the four components of a curriculum. Ding (2005: 37-39) suggests that learning methods and evaluation should directly align with learning objectives and content. The training curriculum developed in this study adheres to this principle, with training content, methods,

and evaluation centered on achieving the training objectives. This approach is consistent with Tyler's goal theory (1949).

In terms of teaching methods, the researcher employed a significant amount of simulation scenario exercises (role-playing) to enhance the integration of theory with practice in learning. This approach aims to reinforce theoretical knowledge while deepening the understanding of theory and enhancing practical ability. This application mirrors the "practice model" proposed by Shi (1996:195-196) in curriculum development, as well as the concepts of practical curriculum development proposed by Zhang (2001: 23), which emphasizes the development of curriculums based on the specific needs of practical situations.

Through leadership enhancement training, standardized training resident physicians can not only enhance their communication and cooperation ability, cultivate team spirit, and improve critical management ability in risk management, crisis management, and decision-making, but also expand their interpersonal networks and foster innovative thinking. Therefore, residency training centers and society as a whole should strengthen the cultivation and training of leadership ability for standardized training resident physicians, laying a solid foundation for their future career development and personal success. At the same time, standardized training resident physicians should actively participate in leadership enhancement training programs to continuously improve their leadership and comprehensive abilities, thereby better adapting to the evolving demands and developments in the field of medicine.

3. Implementation of Developed Leadership Enhancement Curriculum for Resident Physicians

The researcher employed pre- and post-training knowledge tests and tracked leadership levels to compare the changes in leadership knowledge and ability of a 30-person experimental group before and after training. They analyzed the results using statistical methods and found significant differences in leadership knowledge and ability before and after training. The leadership knowledge, communication and cooperation ability, and management ability of the resident physicians were markedly higher after training. Tracking evaluations conducted at 4 weeks after training revealed a continuous improvement in communication, cooperation, and management ability, confirming the propriety, feasibility, utility, accuracy and sustainability of this study. It indicated that post-training leadership knowledge could be internalized into sustained leadership ability enhancement, with enduring and sustainable training effects. Moreover, it suggested that the developed leadership enhancement curriculum for resident physicians in Guangxi Province, People's Republic of China, could be further promoted and used, possessing good social value. This aligns with the values advocated in the Decision on Deepening Education Reform and Promoting Comprehensive Quality Education issued by the CPC Central Committee and the State Council (Li. 2002: 10-14).

4. The Evaluation of the Curriculum for Enhancing the Leadership of Standardized Training Resident Physicians

It is evident that the evaluation of the developed curriculum for enhancing the leadership of standardized training resident physicians in Guangxi Province aligns with specific applications of cognitive learning theories such as Bruner's cognitive structure learning theory, Ausubel's cognitive assimilation learning theory, and information processing learning theory (Smith. 1999: 17). This reflects the important viewpoint of cognitive learning theory that "learning is not just a change in behavior, but also a change in cognitive abilities."

The research findings indicated that the satisfaction level of standardized training resident physicians was at the highest level, overall considering the curriculum to have the highest feasibility, utility, propriety, and relatively high accuracy, achieving the objectives and values of the curriculum.

The educational value of the developed curriculum is essentially a specific manifestation of educational value in the field of curriculum, also representing the curriculum values advocated in the “Decision of the Central Committee of the Communist Party of China and the State Council on Deepening Educational Reform and Comprehensively Promoting Quality Education” (Li. 2002: 10-14).

Suggestions

1. Suggestions for applying research results

1.1 The developed curriculum for enhancing leadership of standardized training resident physicians can be promoted in other training bases within Guangxi Province:

Given its universality, the curriculum holds value and significance for widespread adoption throughout Guangxi Province. Therefore, it is for promotion and utilization in other STRP training bases across Guangxi Province.

1.2 The developed curriculum for enhancing leadership of standardized training resident physicians can be promoted in other provinces of People’s Republic of China:

Developing and implementing curriculum to enhance the leadership of standardized training resident physicians in People’s Republic of China is of great practical and strategic significance for exploring the leadership qualities required for doctors under new circumstances in medical development and how to cultivate medical leadership. The curriculum is universal, and through investigation and demonstration, it has been shown to have high utility, feasibility, propriety, and accuracy. Therefore, it is for nationwide promotion and application throughout People’s Republic of China.

2. Suggestions for Future Research

2.1 In terms of research breadth, the further research should expand and improve the curriculum for standardized training resident physicians, and add other modules.

2.2 In terms of research depth, the further research should study the influencing factors of the leadership of standardized training resident physicians, analyze the underlying reasons that affect the leadership level of standardized training resident physicians.

2.3 In terms of the evaluation mechanism, the further research should improve the evaluation mechanism, establish a multi-angle and multi-level evaluation system from the aspects of standardized training resident physicians themselves, patients and their families, colleagues, teams, superior leaders and the development of the medical industry.

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