Evaluation of the Health Management Research Capabilities and Learning Needs of Hospital Management Personnel

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Abstract: The new era puts forward higher requirements on the quality of hospital management personnel, so it is significant to improve their health management research capabilities and encourage them to solve practical difficulties through scientific research as well as make innovations to their management thinking. In this article, a questionnaire survey of 100 hospital management personnel was carried out in a tertiary hospital in Guangzhou, China, to identify their health management research capabilities and learning needs for related knowledge. The results showed that most of the interviewees were young and middle-aged women with relatively high academic qualifications, mainly in medical and management majors. Their scientific research knowledge base and learning needs are on the average, and their scientific research method foundation is relatively ideal. There are significant differences in scientific research knowledge base, scientific research training needs, and scientific research methods among those with different ages and educational levels ($p<0.05$).

1 Introduction

In the 21st century, thanks to the facilitation of information technology, the work efficiency of traditional industries in China has been greatly improved, and also the traditional time and space barriers have been broken, which further promotes global integration and multilateral cooperation. In particular, after the Chinese government put forward the Belt and Road Initiative in 2013, China has been actively developing economic partnerships with many countries across the world and jointly building a political, economic, and cultural community. In this context, as one of the most important traditional industries, the health industry will definitely be gradually opened up to the world in the new era, which brings opportunities for hospital development as well as challenges for hospital management. In Chinese hospitals, most of the management personnel are transitioned from medical positions, and their previous understanding and training of health management research is relatively insufficient. The model of guiding management with experience is bound to be limited. To improve the level of medical management, hospitals need to be equipped with high-quality management talents, and constantly explore the hospital business strategy, business philosophy, and management model. As a result, the importance of health management, especially research on hospital management, has become increasingly apparent. The health management knowledge and research capabilities of hospital management personnel deserve our research, and further attention should be paid to their learning needs. With the hospital management personnel of Affiliated Cancer Hospital and Institute of Guangzhou Medical University as the respondents, this study carries out a preliminary assessment of their capabilities in health management research, and further understands their learning needs for relevant knowledge.

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2 Literature Review

2.1 New requirements for the professional competence and learning of hospital management personnel in the new era

Hospital management personnel generally refer to the administrative staff responsible for various hospital management tasks in the hospital functional departments[1]. The contents of hospital management involve operational decision-making, process control and system implementation. Therefore, the quality of hospital management personnel exerts an important influence on

the effective implementation of hospital management measures, realization of strategic goals, and establishment of the entire hospital brand. The effectiveness of hospital management is largely related to the business management level, management knowledge base and research and innovation ability of the management personnel[2].

With the increasingly fierce competition in the medical and health industry, the new-generation information technology exerts a huge impact on traditional medical services and medical management, as they have achieve process optimization in the help of information flow, and gradually move towards data decision-making, process integration and even the Internet of Things. The emergence of the new model proposes higher and more comprehensive requirements for the new generation of hospital management personnel in terms of thinking and knowledge composition. Whether hospitals can maintain an advantage in the competition, to a large extent, depends on whether they can establish and train a management team that is efficient, reasonable, and able to deal with challenges. The team members need to expand the depth and breadth of knowledge, uphold the concept of lifelong learning, and continuously improve their own quality and management level. Only in this way can they continuously make innovations, seek change and survive in hospital management[3]. Most of medical management personnel in China have professional medical backgrounds, and most of them have transformed from front-line medical work to hospital management. They have the theoretical foundation and practical experience of professional technology, which means unique advantages in the development of medical professional management, but often due to insufficient management expertise and research experience, they encounter bottlenecks in management practice or management innovation. Li argues that it is difficult to activate management thinking using experience to guide management, so the scientific benefits of management cannot be presented. In the long run, it will inevitably restrict the development of hospitals and ultimately affect the survival of hospitals in industry competition[4]. Gen et al. contend that the professionalization of hospital management personnel is a development trend, and the personnel engaged in hospital management must possess professional knowledge and management skills of hospital management professions such as management, economics, health law, and public relations[5]. Therefore, it is particularly important to strengthen the professional knowledge of health management and improve the research level of health management[2, 6].

2.2 Greater demands for management capability training by hospital management personnel

Relevant research shows that in China, staff engaged in hospital management are gradually strengthening their self-awareness to actively learn health management knowledge, and their demands and enthusiasm for participation in management knowledge and skill training is also increasing. Zhai conducted a survey on the management staff of 28 TCM hospitals in Guangdong Province, China, including hospital leaders, and management staff of functional departments and logistics department, and asked them about their preference of continuing education mode[2]. The results showed that among the 202 survey respondents, most chose the continuing education mode of “observation, further education, and project practical training”, accounting for 52%. Respondents with different working years and different management positions made different choices in continuing education models. Those with more than 25 years of management experience chose “special investigation and scientific research” significantly more than groups of other working years; logistics management personnel tended to choose “course instruction and degree training”[2]. Ye and Liu conducted a survey of 98 hospitals in Jiangsu Province, China, to learn about the participation rate, learning needs, and motivation of the management personnel of these hospitals in continuing education training. The results showed that the participation rate of hospital management personnel was over 90% within one year. 56.9% of them preferred short-term face-to-face training courses. Highly educated talents tended to choose online learning, and management personnel with senior professional titles were more inclined to observation and practical project training. The proportion of management staff who urgently need management skills learning reached 46.3%[6].

3 Research respondents and methods

3.1 Research respondents and questionnaire collection process

In this study, the Affiliated Cancer Hospital and Institute of Guangzhou Medical University was selected as the survey site. The respondents were the staff (over 18 years old) engaged in hospital management in the functional management departments of the hospital. The sample was a level 3A hospital in Guangzhou, with about 200 management personnel, and its level of medical technology and influence were in the leading position in southern China. The survey scale was issued in the form of an electronic questionnaire. We compiled an electronic version of the scale through the online questionnaire website (https://www.wjx.cn/), and respondents obtained online questionnaire by scanning the QR code. After they finished filling out the questionnaire, the data would be automatically saved and uploaded to the website server, and then the database could be exported through the server.

3.2 Scale design

To compile the survey scale used in this study, we referred to the mature scale used by Huang et al. in their investigation of the scientific research level and learning needs of nurses in a Chinese hospital in 2012[7], and

combined the relevant contents of health management research and the practical situation of the surveyed hospital to slightly modify some items. We randomly selected six medical management staff who met the inclusion criteria and conducted face-to-face informal interviews. The interview results showed that the contents of the questionnaire could fairly reflect the research objectives. Based on their feedback, we made further modifications to these items and finally finalized the official version of the questionnaire (The measurement items in the questionnaire were in Chinese. The English version in the appendix was translated from the original Chinese items and was proofread by two bilingual translators.). The questionnaire was mainly composed of 5-point Likert closed questions (1=completely not understand or completely not needed; 7=completely understand or completely needed).

3.3 Statistical methods

This article adopts SPSS 20.0 to process data entry, statistical description, correlation analysis, reliability analysis, and validity analysis.

4 Results

4.1 Sample description

A total of 113 questionnaires were distributed in this survey, 102 questionnaires were collected, and among them 100 were valid questionnaires, with a response rate of 90.3%. According to the statistical results, the proportion of female participating in the survey was relatively high, reaching 69%, while male only accounted for 31%. 52% of the respondents were between 31 and 40 years old, and only 7% were between 51 and 60 years old. In terms of educational background, the proportion of postgraduates was relatively high, reaching 52%, while the proportion of university and junior college students was only 8%. Based on the answers of the respondents, we divided their professional backgrounds into six categories: medical, health management, other management, information, finance, and others. According to statistics, the proportion of respondents with the professional background of "other management" was relatively high, accounting for about 26%; the proportion of respondents with the professional background of "information" was relatively low, accounting for 6%. In addition, most of the medical management personnel participating in this survey came from the "medical business management department", accounting for about 33%, and the respondents from the personnel department accounted for the least proportion of 7%. The details were presented as per Table 1.

Table 1 Descriptive statistics of the basic information of respondents

Category	Variable	Frequency	Percentage
Gender	Male	31	31.0
	Female	69	69.0
Age	18-30	18	18.0
	31-40	52	52.0
	41-50	23	23.0
	51-60	7	7.0
Educational background	Master	52	52.0
	Bachelor	40	40.0
	Junior college graduates	8	8.0
Category of majors	Medical care	33	33.0
	Health management	12	12.0
	Other management	26	26.0
	Information	6	6.0
	Finance and accounting	12	12.0
	Others	11	11.0
Department	Financial management department	15	15.0
	Logistics and general affairs department	13	13.0
	Science and education business management department	13	13.0
	Human resources department	7	7.0
	Information business management department	9	9.0
	Medical business management department	33	33.0
	Hospital affairs and discipline inspection department	10	10.0

4.2 Reliability and validity of the questionnaire

It can be seen from Table 2 that the observed value of Barlett's Test was 1227.385, and the corresponding *p* value was 0.000. Since *p* was less than the significance level a (0.05), the null hypothesis should be ruled out. There was a significant difference between the correlation coefficient matrix and the identity matrix. The KMO value was 0.848. According to the KMO metric given by Kaiser, items in the questionnaire were suitable for factor analysis.

In the results of factor analysis, the indicators used to evaluate the validity mainly included the cumulative proportion of variance and factor loading. The cumulative proportion of variance reflected the cumulative effectiveness of the common factor on the scale or questionnaire, and the factor load reflected the degree of correlation between the original variable and a common factor. The principal component method was used to extract the factors in this research, and the Varimax was used to rotate the matrix, and the rotated component matrix was shown in Table 3. According to Table 3, the 15 items of the influencing factors of the management science and research knowledge base of the hospital management personnel and their needs for training were divided into three factors. Item 11-16 had relatively high loading in the first factor which was named "scientific research method base". Item17-21 had relatively high loading in the second factor which was named "scientific research and training needs". Item7-10 had relatively high loading in the third factor which was named "scientific research knowledge base". The items included in the three common factors were all consistent with the original questionnaire design dimensions, and the questionnaire had good validity. Cumulative proportion of variance was the proportion of variance caused by all common factors to the total variance, explaining the total influence of all common factors on the dependent variables. Cumulative proportion of variance was shown as per Table 3.

Table 2 Results of KMO and Barlett's Test

KMO Measure of Sampling Adequacy		0.848
Barlett's Test of Sphericity	Approximate Chi-Square	1227.385
	Variance	105
	Significance	0.000

Table 3 Component matrix loading and factor naming

Factor Naming	Items	Component		
		1	2	3
Scientific research method base	12. Your understanding of qualitative research	0.858		
	11. Your understanding of quantitative research	0.856		
	13. Your understanding of induction and deduction method	0.849		
	15. Your understanding of literature review method	0.822		
	14. Your understanding of the difference between questionnaire survey and case analysis	0.769		
	16. Your understanding of research model building	0.677		
Scientific research training needs	20. Training of literature retrieval and reading		0.923	
	19. Training of academic paper submission		0.899	
	18. Training of academic paper writing		0.896	
	17. Training of research design		0.862	
	21. Training of statistical methods		0.847	
Scientific research knowledge base	9. Your understanding of the difference between research questions and research problem			0.793
	7. Your understanding of the difference between traditional Chinese and Western scientific research thinking			0.791
	8. Your understanding of the difference between clinical medicine research design and management science research design			0.780
	9. Your understanding of the difference between positivism and phenomenalism research			0.590

Note. Extraction method: principal component analysis; Rotation method: Varimax with Kaiser normalization; Rotation converged in three iterations

According to Table 4, the variance contribution rate of the first common factor was 29.493%, the variance contribution rate of the second common factor was 26.888%, the variance contribution rate of the third common factor was 17.968%, and the cumulative variance contribution of the three factors was 74.349%>70%. It can be seen that the extracted factor variation had a strong explanatory power for all variable variation, and could explain 70.817% of all items. The Cronbach's α of the subscales represented by each factor as well as the overall scale were above 0.8 (scientific research knowledge base 0.824, scientific research training needs 0.926, scientific research method base 0.935, total scale 0.899), and the reliability of the questionnaire was ideal. After passing the factor analysis test, we analyzed the correlation between the variables. According to Table 5, there was a significant correlation between scientific research knowledge base and scientific research training needs (r=0.653, p=0.000<0.01), indicating that the more the respondents understand the scientific research knowledge base, the higher the degree of their needs for scientific research training; there was a significant correlation between scientific research training needs and scientific research method base (r=0.222, p=0.026<0.05), indicating that the more the respondents understand the scientific research method base, the higher the degree of their needs for scientific research training.

Table 4 Total variance explained

Common Factor	Eigenvalue	Variance %	Cumulative
1	4.424	29.493	29.493
2	4.033	26.888	56.381
3	2.695	17.968	74.349

Table 5 Pearson's correlation of factors

	Scientific research knowledge base	Scientific research training needs	Scientific research method base
Scientific research knowledge base		0.000*	0.097
Scientific research training needs	0.000*		0.026*
Scientific research method base	0.097	0.026*	

Note. * Correlation is significant at the 0.05level (2-tailed)

According to Table 6, the score of "scientific research method base" of the respondents in the health management discipline was acceptable, with an average close to 4 points; however, their scores of "scientific research knowledge base" and "scientific research training needs" were not satisfactory, with an average score of no more than 3 points.

Table 6 Descriptive analysis of the scores of factors

	N	Minimum	Maximum	Mean	Standard Deviation	Median
Scientific research knowledge base	100	1.00	4.25	2.39	0.75	2.5
Scientific research training needs	100	1.00	5.00	2.93	0.88	3
Scientific research method base	100	1.40	5.00	3.83	0.89	4

4.3 Impact of different professional background, age and educational background on the components

Table 7 Impact of educational background on the components

	N	Scientific research knowledge base	Scientific research training needs	Scientific research method base
Master	52	2.606±0.702	3.317±0.727	3.881±0.85
Bachelor	40	2.25±0.723	2.654±0.788	4.03±0.748
Junior college graduates	8	1.719±0.674	1.75±0.642	2.55±0.893
F		6.778	19.710	11.210
p		0.002	0.000	0.000

Post hoc	Master>Bachelor, Junior college graduates	Master>Bachelor, Junior college graduates	Master>Bachelor; Bachelor>Junior college graduates

Table 8 Impact of different age groups on the components

	N	Scientific research knowledge base	Scientific research training needs	Scientific research method base
18-30	18	2.333±0.723	3.222±0.889	4.067±0.887
31-40	52	2.529±0.739	3.141±0.742	3.923±0.771
41-50	23	2.185±0.762	2.283±0.891	3.565±1.075
51-60	7	2.214±0.796	2.69±0.729	3.457±0.991
F		1.348	7.150	1.725
p		0.264	0.000	0.167
Post hoc			18-30>41-50;31-40>41-50	

According to the one-way ANOVA, respondents with different educational backgrounds had significant differences in scientific research knowledge base, scientific research training needs, and scientific research method base ($p<0.05$). After post hoc, masters had significantly higher degree of understanding of the scientific research knowledge base and research training needs than bachelors and junior college graduates; masters and bachelors had significantly higher understanding of scientific research method base than junior college graduates. Respondents with different ages had significant differences in the scientific research training needs ($p<0.05$). After post hoc, the scientific research training needs of respondents in the 18-30 and 31-40 age groups were significantly higher than those in the 41-50 age group. The details were in Table 7 and Table 8. In addition, according to the statistical results, there were no significant differences in the scientific research knowledge base, scientific research training needs, and scientific research method basis among respondents of different professional backgrounds.

5 Discussion

Based on the survey results and the analysis of the basic situation of the interviewees, we learn that most of the respondents are women, aging mostly from 31 to 40 years old, indicating that the hospital management personnel are middle-aged business backbones, and most of them are women. They have better energy and creativity, and can better adapt to the increasingly complex and arduous hospital management work. Compared with front-line clinical medical work, the working hours of hospital administrative management are relatively regular, and the intensity is relatively low. Women in the health industry are more involved in hospital management jobs out of consideration of caring for family affairs [8]. The majority of them are undergraduates or above, and more than half of them have graduate degrees, which reflects that the personnel engaged in hospital management in the new era have a good educational foundation, and the entry threshold is relatively high. In terms of professional background, medical professionals still account for a large proportion, but the proportion of management professionals is basically the same as that of medical professionals, reflecting that hospitals have gradually realized the importance of management professionals participating in hospital management. The management personnel has gradually transformed from the traditional model in which clinical front-line staff account for the largest proportion to a situation where medical professionals and management professionals are equally important. This is basically consistent with the results of the human resources status survey of functional departments carried out by Li Zeng in the tertiary hospitals in Shanxi Province, China[9].

In addition, through the analysis of the results, we know that the higher the educational level of the interviewee, the more ideal their mastery of scientific research knowledge base and scientific research method foundation of the health management discipline, and the higher their demands for the study of health management scientific research knowledge and methods. It is considered to be closely related to the basic education of scientific research continuously carried out at different stages of higher education. With the continuous improvement of education level, the learning interests and initiative cultivated by respondents will become stronger [10]. The learning needs of the respondents are also closely related to their age. The young and middle-aged hospital management personnel have vigorous personal energy and are at the core stage of job competition, so their learning needs are obviously stronger than those of the middle-aged and elderly.

6 Conclusion

The core competitiveness of a hospital is closely related to the medical service quality and medical technology, and it also requires scientific and efficient management methods. Therefore, training a management team with high quality, proficient skills and strong capabilities is the foundation to ensure the in-depth advancement of hospital reform and efficient and orderly hospital management [11]. The survey results of this study reflect, to a certain extent, the basic situation of hospital management personnel in tertiary hospitals in China. The educational level and professional background are gradually developing in a high-level and diversified

direction. However, we can also know from the results that the scientific research foundation of the health management discipline of the hospital management personnel is not ideal, and the learning needs should be further stimulated. These issues need to be valued by senior hospital administrators and health industry leaders. To strengthen professional training, hospitals establish a continuing education mechanism, and implement incentives and evaluation methods might be the approaches that can be considered.

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