Research article

Core competence of midwives in township hospitals and its influencing factors—A cross-sectional study

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ABSTRACT

Objective: This study aimed to assess the core competence of midwives in township hospitals through a self-assessment questionnaire. The relationship between professional identity and core competence and the factors influencing midwives' core competence was also investigated.
Method: Convenience sampling was conducted in 77 township hospitals in Ganzhou, Jiangxi Province, China, with 150 participants. The questionnaires were distributed online in November 2021. We conducted a descriptive data analysis, a correlation analysis of the two variables of professional identity and core competencies, and multivariate linear regression to analyse the influencing factors, including the sociodemographic information, the Midwife Core Competence Scale, and the Nurses' Professional Identity Scale scores.
Results: The mean score for the core competence was 206.43 ($\pm$37.45) out of 270. The highest score was for pregnancy care (3.97 $\pm$ 0.70) and the lowest was for newborn care (3.72 $\pm$ 0.78). The independent sample *t*-test results and one-way analysis of variance showed that qualifications, midwifery training situation, and midwifery working years had differential effects on midwives' core competencies ($P < 0.05$). Multiple linear regression showed that qualifications, midwifery working years, and level of professional identity were influencing factors ($P < 0.05$).
Conclusions: The core competencies of midwives in township hospitals were lower than those reported in other studies. Advancements in education, midwifery working years, and professional identity may increase midwives' core competencies.

1. Introduction

Midwives are the primary providers of high-quality spontaneous delivery and maternal and newborn services [1]. Research shows that midwives can improve the satisfaction of the parturient in the pre-delivery, delivery, and post-delivery processes, give the mother a good sense of experience, facilitate smooth labour, and reduce the possibility of dystocia [2]. The global demand for medical

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Abbreviations

NNLE   National Nurse Licensure Examination
ICM   International Confederation of Midwives

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personnel is increasing, and pregnant women and newborns are increasingly susceptible to various types of viruses. Therefore, there is an urgent need to increase the number of skilled midwives and upgrade their core competencies.

In China, midwives must pass the National Nurse Licensure Examination (NNLE), register as nurses, and pass the NNLE to obtain the maternal and child midwife qualification certificate. However, due to the limited number of midwives, some registered nurses can work as midwives after completing midwifery training. Midwives are required to take regular skills tests and training during work. Midwives not only lead vaginal births and assist obstetricians in the department of obstetrics, but also take on nursing work under the management of nursing leaders in hospitals. In 2014, China began offering undergraduate midwifery education. Midwifery education is divided into three levels: technical secondary school, junior college and undergraduate [3]. Midwifery students must coplete all basic nursing courses while receiving their midwifery education in school. Midwifery is closely related to nursing practices in China.

Based on the different functions and tasks of hospitals, the hospital grading management system divides hospitals into primary, secondary, and tertiary grades. The higher the level, the better the hospital's medical resources [4]. Township hospitals are first-grade hospitals in the hospital grading system. Township hospitals provider primary healthcare essential in coordinating and connecting county and village medical institutions to rural healthcare systems [5]. In 2015, the '13th Five-Year Plan for Deepening the Reform of the Medical and Health-care System' proposed improving the tiered diagnosis and treatment system to reverse the unreasonable distribution of medical resources and address the imbalance between urban and rural resources. Therefore, the professional competencies of midwives in township hospitals are particularly important to improve.

The International Confederation of Midwives (ICM) defines midwives' core competencies as 'a combination of knowledge, skills, and professional behaviours, which is an essential indicator of the quality of midwifery services' [6]. According to midwives' core competence standards developed by the ICM, Wang et al. [7] divided core competencies into six dimensions of care: pre-pregnancy, pregnancy, delivery, postpartum, newborn, and public health. This accurately reflects midwives' level of competence at all stages of maternal and neonatal care. Providing high-quality maternal and child health care services requires improving midwives' core competencies, and one strategy is to enhance their professional identity.

Professional identity is defined as 'the attitudes, values, knowledge, beliefs and skills shared with others within a professional group' [8]. A comprehensive understanding of the profession and a rich knowledge base form the basis of an individual's work capacity. The stronger the professional identity, the stronger the nurses' work capacity. Although the relationship between professional identity and competence has been explored previously [9,10], few studies have addressed areas related to midwifery. Different types of research on midwives' core competencies exist in China. However, previous studies have focused on midwives in tertiary and secondary hospitals, and few have examined midwifery in township hospitals [11].

Therefore, this study aimed to investigate the status of midwives' core competence in township hospitals in Ganzhou, Jiangxi Province. We also investigated the correlation between professional identity and core competence, and whether professional identity and demographic characteristics affect midwives' core competence.

2. Materials and methods

2.1. Study design and setting

Owing to the small number of midwives in township hospitals, this anonymous cross-sectional study was conducted by convenience sampling in November 2021 in 77 township hospitals in four cities in Jiangxi Province: Ganzhou, Xinyu, Jingdezhen, and Pingxiang. This study was reviewed and approved by our Ethics Committee (No. LLSC-2023-126).

2.2. Participants

We recruited a convenience sample of 150 midwives from various township hospitals. Additionally, we chose individuals who voluntarily participated and could complete the questionnaires independently, excluding interns, trainees, and non-on-the-job personnel(be on leave but keep position).

According to the sample size calculation method for linear regression analysis (sample size is 5–10 times the dependent variable) and considering 5 % of invalid questionnaires, the required sample size for this study was at least 105.

2.3. Measures

2.3.1. Investigation tools

(1) Sociodemographic information was collected using a self-designed questionnaire, that included age and educational background (technical secondary, junior college, and undergraduate). China's educational levels can be divided into three

categories: primary education, secondary education, and higher education. Other data collected were educational background major, professional title, duty, maternal and child health care assessment certificate, time of training, working years, and employment form (including contract system, personnel agent, authorised strength preparation, and authorised strength). The authorised strength of hospitals in China is the system of reasonable arrangement and effective management of hospital personnel, funds, materials, and other aspects).

(2) Professional identities of midwives were assessed using the Nurses' Professional Identity Scale developed by Liu et al. [12]. This scale includes five dimensions: professional cognitive evaluation, professional social support, professional social skills, professional frustration coping, and professional self-reflection, involving 30 items. The scale uses a Likert 5-grade scoring method (1 = strongly inconsistent, 5 = strongly consistent) for each item. The total score is calculated by the sum of the scores for each item. A higher score indicated a higher level of professional identity. The total score ranged from 30 to 150, the score of the lowest level is 30–60, the lower is 61–90, the medium is 91–120, and the high is 121–150. The overall Cronbach's α of this scale in this study was 0.984, and the range of Cronbach's α of each dimension was 0.890–0.962.

(3) Midwives' core competence was assessed using the Midwife Core Competence Scale developed by Wang [7]. The scale is based on midwives' competence criteria formulated by the ICM and contains six dimensions involving 56 items: pre-pregnancy care, pregnancy care, delivery care, postpartum care, newborn care, and public health care. The scale uses a Likert 5-grade scoring method (1 = not at all capable, 5 = fully capable) for each item. The total score is calculated as the sum of the scores for each item. The total score ranged from 54 to 270. The higher the score, the higher the core competence level. The Cronbach's α of the scale was 0.993, and the Cronbach's α of each dimension was 0.960–0.988.

2.3.2. Investigation methods

This study used an online platform, Wenjuanxing (https://www.wjx.cn/), to distribute and collect questionnaires. The participants were informed of the research objective and the instructions before completing the questionnaires. All questions were required to be answered (except skip questions), and each participant can only complete the questionnaire once.

2.3.3. Statistical methods

Data were imported into SPSS version 25.0. Descriptive analyses using frequency, percentage, and mean ± standard deviation (M ±SD), the independent sample t-test, and one-way analysis of variance were performed. The Pearson correlation coefficient was used to explore the relationship between core competence and the professional identity of midwives. Multiple linear regression was used to investigate the factors influencing midwives' core competence. $P < 0.05$ was considered statistically significant.

3. Results

3.1. Midwives' core competence scores

A total of 150 valid data were collected. The results in Table 1 revealed that the total mean score of core competence was 206.43 (±37.45) out of 270, and the item mean score was 3.82 (±0.69). Pregnancy care was the item with the highest score of 3.97 (±0.70), and newborn care was the lowest score of 3.72 (±0.78).

Table 2 presents the social demographic information of the respondents and the scores of the variables. Univariate analyses among the variables are also presented in Table 2. The results revealed that age, educational background, maternal and child health care technology assessment certificate, midwifery training situation, midwifery working years, and professional identity had differential effects on the core competence of midwives.

3.2. Midwives' professional identity scores

The Midwives' professional identity total score ranged from 30 to 150, the score of the lowest level was 30–60, the lower was 61–90, the medium was 91–120, and the high was 121–150. The overall mean score of professional identity was 112.6(±21.42), this indicates that the overall level of professional identity of midwives was moderate in Table 3.

Table 1

The scores of core competence of midwives (in descending order of dimensional each item score).

Dimension	Number of items	Total score (M±SD)	Item score (M±SD)	Rank
pregnancy care	10	39.67 ± 7.04	3.97 ± 0.70	1
postpartum care	8	31.06 ± 6.11	3.88 ± 0.76	2
public health care	11	42.15 ± 8.11	3.83 ± 0.74	3
pre-pregnancy care	6	22.71 ± 4.12	3.78 ± 0.69	4
delivery care	13	48.51 ± 10.15	3.73 ± 0.78	5
newborn care	6	22.35 ± 4.70	3.72 ± 0.78	6
Total score	54	206.43 ± 37.45	3.82 ± 0.69	

Note, M±SD = mean ± standard deviation.

Table 2
The comparison of core competence among social demographic characteristics.

	Variable	N (%)	Scores	t/F	P
	Age(years)				
Group A	≤25	28(18.7 %)	3.76 ± 0.81	2.858	0.039
Group B	26–35	69(46 %)	3.68 ± 0.70		
Group C	36–45	43(28.7 %)	4.03 ± 0.57		
Group D	> 46	10(6.7 %)	4.07 ± 0.49		
	Education background				
Group A	Technical secondary school	81(54 %)	3.69 ± 0.72	4.232	0.016
Group B	Junior College	60(40 %)	3.94 ± 0.61		
Group C	Bachelor degree or above	9(6 %)	4.24 ± 0.69		
	Graduate major				
Group A	Nursing	9(6 %)	3.57 ± 0.64	1.695	0.187
Group B	Midwifery	68(45.3 %)	3.75 ± 0.83		
Group C	Others	73(48.7 %)	3.72 ± 0.53		
	Professional titles				
Group A	Undecided or none	20(13.3 %)	3.55 ± 0.75	1.761	0.157
Group B	Elementary	87(58 %)	3.80 ± 0.69		
Group C	Intermediate	40(26.7 %)	3.98 ± 0.66		
Group D	Vice senior and above	3(2 %)	3.98 ± 0.20		
	Duty				
Group A	Nurse or midwife	137(91.3 %)	3.81 ± 0.69	0.256	0.775
Group B	Group leader of midwife group	4(2.7 %)	4.02 ± 0.64		
Group C	Head nurse or chief midwife	9(6 %)	3.91 ± 0.71		
	Maternal and Child Health Care Technology Assessment Certificate				
Group A	No	47(31.3 %)	3.62 ± 0.57	0.606	0.017
Group B	Yes	103(68.7 %)	3.91 ± 0.72		
	Midwifery training situation(months)				
Group A	None	75(50 %)	3.56 ± 0.71	6.882	< 0.01
Group B	≤6	49(32.7 %)	4.02 ± 0.58		
Group C	7–12	15(10 %)	4.17 ± 0.53		
Group D	13–24	7(4.7 %)	4.02 ± 0.55		
Group E	> 24	4(2 %)	4.57 ± 0.48		
	Midwifery working years				
Group A	< 5	67(44.7 %)	3.61 ± 0.79	5.888	< 0.01
Group B	5–9	28(18.7 %)	3.77 ± 0.58		
Group C	10–19	32(21.3 %)	4.15 ± 0.46		
Group D	≥20	23(15.3 %)	4.03 ± 0.54		
	Form of employment				
Group A	Contract system	51(34 %)	3.72 ± 0.86	0.678	0.567
Group B	Personnel agent	2(1.3 %)	3.53 ± 0.66		
Group C	Preparation of authorized strength	2(1.3 %)	3.90 ± 0.14		
Group D	Authorized strength	95(63.3 %)	3.82 ± 0.69		
	Professional identity			15.264	< 0.01
Group A	Low	4(2.7 %)	3.25 ± 1.66		
Group B	Relatively low	16(10.7 %)	3.29 ± 0.52		
Group C	Medium	91(60.7 %)	3.72 ± 0.51		
Group D	High	39(26.0 %)	4.33 ± 0.70		

3.3. Correlation between core competence and professional identity of midwives

The correlation coefficient was 0.470 ($p < 0.001$) between core competence and professional identity of midwives, which revealed that they were significantly related.

Table 3
The scores of professional identity of midwives.

Dimension	Number of items	Total score (M±SD)	Mean Score(M±SD)
professional cognitive evaluation	9	33.09 ± 6.94	3.68 ± 0.77
professional social support	6	22.76 ± 4.29	3.79 ± 0.72
professional social skills	6	22.11 ± 4.42	3.69 ± 0.74
professional frustration coping	6	23.20 ± 4.37	3.87 ± 0.73
professional self-reflection	3	11.44 ± 2.28	3.81 ± 0.76
Total score	30	112.60 ± 21.42	

3.4. Multiple linear regression for core competence

The total mean score of midwives' core competence was used as a dependent variable, and the variables that had differential effects on core competence scores in general data were used as independent variables. The multivariate model indicated that educational background, midwifery working years, and professional identity were the influencing factors (Table 4).

4. Discussion

4.1. Analysis of scores of midwives' competencies in township hospitals

This study revealed that the total average score of midwives' core competencies in township hospitals in Jiangxi province was 3.82 ($\pm$0.69). This was a lower score than in previous studies [13,14]. This finding suggests that the core competence levels of midwives in township hospitals in Ganzhou generally must be improved. The core competence scores of township hospitals were much lower than those of large-scale hospitals in cities [15,16]. This situation might be related to the composition of the hospital staff and they were trained [17]. Primary health care has been understaffed, and township hospitals have not arranged for medical workers to attend training during work hours [18]. The training mainly includes: theoretical training (nursing quality management, nursing safety management, nursing performance management and special training combined with problems existing in the nursing management of the hospital) and nursing skill operation training (training combined with basic nursing technology and special nursing technology in clinical work). The demographic characteristics suggested that more than half of the midwives have completed from technical secondary education. This indicates that the total educational level of midwives in township hospitals was low, and the number of midwives who graduated from junior college was insufficient. The majority of graduate majors were in nursing, indicating that most midwives were transferred from nursing or other professions to midwifery and might not have received complete training in midwifery. These finding also align with the current situation in China's midwifery education and national conditions [19].

The highest scoring dimensions were pregnancy and postnatal care, while delivery and neonatal care had the lowest scores. Most pregnant women choose to give birth in large-scale hospitals with better medical conditions; nearby hospitals are convenient for prenatal and postnatal examinations [20,21]. The potential consequences include a decline in the number of births in township hospitals, a decrease in the practical experience gained by midwives during childbirth, and a reduction in training opportunities to acquire essential skills related to birth and newborn care. Consequently, these factors might contribute to the lower scores observed during childbirth and the neonatal period, leading to higher scores during pregnancy. In China, the situation of midwives is complex. Midwives have heavy workloads. They integrate midwifery and nursing, and their professional positions lie between doctors and nurses. However, the work jurisdiction among midwives, nurses, and obstetricians remains unclear [22]. Fully developing midwives' professional competencies is challenging. This has further exacerbated the uneven development of midwives' capacities in township hospitals. Therefore, allocating resources reasonably and optimising the human power structure is imperative.

4.2. Analysis of influencing factors of midwives' core competencies

The results of the multiple linear regression presented that the educational background of midwifery, midwifery working years, and professional identity were all valid factors for core competence. Meanwhile, there was no statistically significant difference effect of age, maternal and child health assessment certificate, or training situation on midwives' core competence (P > 0.05).

4.2.1. Explanation of the educational background factor

The results suggest that participants with junior college qualifications or above had significantly higher core competence scores than those with technical secondary qualifications. As midwives continue their education, their learning abilities and core competencies improve. Research has also shown that highly educated midwives can provide better care for pregnant women and decrease maternal mortality rates [23]. Improvement in qualifications is vital for core competencies. This indicates that higher education for midwives should be developed to provide educational resources for the advancement of midwives.

Table 4
Results of multiple linear regression analysis.

Variables	B	SE	B′	t	P
Constant	1.738	0.300		5.797	0.000
Age	−0.032	0.076	−0.038	−0.417	0.677
Educational background	0.232	0.081	0.205	2.873	0.005
Maternal and Child Health Care Technology Assessment Certificate	0.017	0.115	0.011	0.147	0.883
Midwifery training situation(months)	0.064	0.062	0.092	1.030	0.305
Midwifery working years	0.153	0.061	0.251	2.499	0.014
Professional identity scores	0.433	0.070	0.429	6.194	0.000

$R^2 = 0.352$, adjusted $R^2 = 0.325$, F = 12.950.
Note, B = beta, SE = standard deviation.

4.2.2. Explanation of the midwifery working years

Core competence scores increased with the midwives' working years, which is consistent with the results of previous studies in China [15]. Midwifery is practical and technical, and it is insufficient to improve the comprehensive ability by relying only on theoretical knowledge. According to Benner's 'Form novice to expert' theory [24], accumulating work experience helps midwives improve their competence, thus increasing their core competencies. Because of the shortage of human resources, difficulty in recruitment, and poor development prospects, many novice midwives cannot sustain the workload of health services in township hospitals [25]. Novice midwives are often fresh out of school; they have a wealth of theoretical knowledge but no childbirth or practical experience. Long-term guidance and support from expert midwives can help novice midwives overcome the anxiety and helplessness of their new position and enhance their professional confidence and core competencies [26,27].

4.2.3. Explanation of professional identity

The results of multiple linear regression showed that professional identity could affect core competence (P < 0.01), and Pearson Correlation Analysis showed that there was a significant positive correlation between core competence and professional identity (P < 0.001). The results suggested that the stronger the core competence of midwives, the higher the professional identity.

Professional identity is important in improving midwives' job satisfaction and retention rates [28]. In the present study, professional identity was moderate. Notably, this study was conducted during the COVID-19 pandemic, when positive media coverage of the healthcare industry and public attention towards healthcare workers increased, which may have positively affected midwives' professional identity [29].

However, there is currently no independent professional title system for midwives that is comparable to nursing in China. Little is known about the professional roles of midwives. Meanwhile, township hospitals are in a situation of having few patients and midwives, low benefits, poor treatment, and subpar development prospects for practitioners, and the value of midwives is being recognised and reflected. This situation has resulted in a high rate of midwife turnover and has hurt midwives' professional identites [30]. Feeling of inferiority in the profession and frequent staff transfers may reduce midwives' core competencies in township hospitals.

Developing midwives' professional identities is influenced by the skills, knowledge, and values inherent in the profession [31]. During the process of accumulating work experience, midwives' skills, and knowledge constantly improve. Improving midwives' abilities can enhance the sense of accomplishment and social recognition. Positive feedback can motivate a sense of belonging and career satisfaction. The core competence of midwives is influenced by their professional identity, and vice versa. Therefore, it is necessary to enhance the professional identity of midwives in various ways, such as standardising the midwifery professional system and promotion policy and clarifying the duties and division of labour to enrich the midwives' sense of belonging to the profession. Social media coverage of midwifery can also be used to raise public awareness and its core competencies.

4.3. Limitations

This study had some limitations. First, although the participants were selected from 77 township hospitals in Ganzhou, there were only 150 participants, which might have reduced the power of the findings. Therefore, increasing the sample size in future studies will be necessary. Second, countries use different research tools to assess midwives' core competencies and professional identity, and international comparisons are lacking. Finally, as midwives must be licenced as nurses in China, their training is similar to that of nurses. The questionnaire used in this study has good validity, and has been widely used in research on the professional identities of midwives. However, owing to the lack of professional identity tools for midwives in China, this study adopted the questionnaire on professional identity for nurses.

5. Conclusions

The core competencies of midwives are essential in reducing maternal and neonatal mortality rates in township hospitals in China. These competencies in township hospitals need improvement, especially for delivery and newborn care. Age, educational background, maternal and child health-care technology assessment certificates, midwifery training-situation, midwifery working years, and professional identity had differential effects on midwives' core competencies. Only educational background, midwifery working years, and professional identity were factors influencing core competencies. In addition, a significant correlation was observed between professional identity and core competencies. These results can provide a reference for improving midwives' core competencies in township hospitals, accelerating the achievement of the 'Healthy China 2030' policy.

Data availability statement

Data will be made available on request.

Ethical approval

This study has the favorable report of the Ethics Committee of the First Affiliated Hospital of Gannan Medical University (No. LLSC-2023-126) and the informed and voluntary consent of the participants and respect for their freedom, according to the Declaration from Helsinki.

The purpose of the investigation, its risks, effects, and consequences have been informed, and confidentiality, privacy, and

anonymity have been guaranteed at all times.

CRediT authorship contribution statement

Huiyi Luo: Writing – original draft, Formal analysis. **Huping Gong:** Writing – review & editing, Methodology. **Feng Luo:** Writing – review & editing, Investigation. **Ying Xing:** Investigation. **Xin Wang:** Formal analysis. **Jingwen Huang:** Software. **Mei Ding:** Funding acquisition. **Dongmei Lin:** Visualization, Supervision, Conceptualization. **Yanli Lan:** Writing – review & editing, Supervision, Methodology, Formal analysis.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:Yanli Lan reports was provided by Jiangxi Provincial Association of Social Sciences. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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