Predictors and Levels of High-Risk/Emergency Management Competence among Newly Qualified Midwives in Morocco: A Cross-Sectional Study

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Abstract: Midwifery education is fundamental to ensure that midwives have the appropriate skills to manage critical situations and prevent maternal and neonatal mortality. To achieve Sustainable Development Goals (SDGs) 4 and 5 by 2030 and strengthen the professional role of midwives, Morocco has implemented a competency-based training programme. This study aimed to describe the level of competence in managing high-risk/emergency situations and the predictive factors of competence among newly graduated midwives. An anonymous online survey was conducted from 31 July to 26 October 2021 among 186 newly graduated midwives. Data were collected using a Demographic Characteristics Questionnaire, the Pre-Service Education Assessment Tool, and the Novice High-Risk/ Emergency Management Competence Self-Assessment Tool. Data were analysed using SPSS version 26.0. Pearson's correlation analysis was used to explore the association between high-risk/emergency management competence and its predictors. Stepwise multiple linear regression was used to explore the influencing factors.

Results indicate that Moroccan newly graduated midwives were moderately competent in managing high-risk situations and emergencies. Insufficient support from teachers and supervisors, limited practical clinical experience, and lack of learning resources were significant predictors of high-risk/emergency management competence, explaining 73.2% of the variance in the high-risk/emergency management competence. The consistency of these findings across different educational settings worldwide suggests that this is a common challenge. Therefore, the implementation of a competence-based training programme as an independent action is insufficient to achieve the intended results. Building the capacity of midwifery teachers and supervisors and responding to the international call for enhanced resources in midwifery education, both in academic and clinical settings, is a critical step toward improving midwives' competencies.

Keywords: Competence, Competency-based education, Emergency management, High risk, Midwife, Midwifery teachers, New graduates, Supervisors

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Introduction

High-risk pregnancies or births refer to situations where the mother, foetus or newborn faces an elevated risk of death, disability, or impairment.[1,2] High-risk complications affect around 15% of all pregnant women.[3] In 2020, an estimated 287,000 women worldwide died from complications related to pregnancy and childbirth, with most of these deaths being preventable.[4] Postpartum haemorrhage, infections, and high blood pressure during pregnancy and delivery are major complications that contribute to nearly 75% of all maternal deaths in developing countries.[4] Evidence indicates that care provided by skilled midwives could avert 83% of all maternal deaths, stillbirths and neonatal deaths.[5] Therefore, high-quality midwifery education is crucial for equipping midwives with the essential competencies required for effective maternal and neonatal care.[7,8-10] Nevertheless, there are various global calls and efforts to improve midwifery skills through education and training.[9,11] Recent studies indicate a lack of competence among midwifery students upon graduation worldwide,[12,13] particularly in managing high-risk complications and emergencies.[13,14] The main underlying reasons are insufficient clinical experience and lack of mentoring and supervision.[14,15] In the Middle East and North African (MENA) region, most countries faced a shortage of qualified midwifery educators, adequate facilities, and standardized curricula necessary to effectively prepare competent midwives.[16]

In Morocco, despite having access to proficient medical and midwifery personnel within healthcare facilities, 80% of deaths are preventable.[17] The main contributor to hospital deaths is inadequate risk assessment.[17] The Ministry of Health has developed and implemented an action plan to strengthen midwifery, which has led to educational changes, including a competency-based education (CBE) programme aligned with the International Confederation of Midwives (ICM) standards.[18] Since then, midwifery diploma students study for six semesters, the curriculum structure being 1150 hours of theory and 1040 hours of clinical practice.[14] In clinical placements students are supervised by the institute's teaching staff, as well as practicing midwives and nurses.[14] Previous studies in Morocco by Abou-Malham and colleagues[18] assessed the implementation of the action plan and revealed significant shortcomings. The intervention led only to the development of the CBE program, rather than its full implementation.[18] In a qualitative study,[14] midwifery students and newly graduated midwives expressed anxiety about their ability to manage high-risk situations and emergencies when working alone after graduation.[14] In the current system, newly qualified midwives may be inadequately prepared to provide competent care, particularly in high-risk or emergency situations, leading to unsafe deliveries and adverse maternal and neonatal outcomes. However, there is an acute lack of systematically documented evidence regarding the practice of midwifery in Morocco, to confirm that factors such as students, curriculum, clinical teachers'/supervisors' support, practical clinical experience, and learning resources can influence the development of midwifery competence in managing high-risk and emergency situations. Therefore, this study aimed to assess the competence of newly graduated midwives in managing high-risk and emergency situations, as well as to identify the factors that predict this competence. The findings could serve as valuable input for enhancing midwifery education, particularly in countries working towards achieving the SDGs of reducing maternal and neonatal mortality.

Review of Literature and Conceptual Framework

The pre-service education (PSE) conceptual framework proposed by Johnson and colleagues[19] was used in this study to investigate the factors affecting the development of competence in managing high-risk and emergency situations. The ICM and the World

Health Organization (WHO) have widely recognised this model.[20] The assessment criteria were based on global standards and guidelines established by the ICM[21,22] and the core competencies for midwifery educators published by the WHO.[23] The PSE framework suggests that high-quality pre−service education forms the foundation for producing a well−trained and competent workforce necessary to achieve the desired health outcomes.[19,20] The model identifies five categories of inputs that can influence student achievement of competency prior to entry into the workforce: 1) students, 2) curriculum, 3) clinical teachers/supervisors, 4) practical clinical experience, and 5) learning resources.[19] These influencing factors could impact intermediate[19] and performance[20] outcomes. Continued reductions in maternal mortality require comprehensive improvements in the quality of care, particularly in managing the major complications that account for nearly 75% of all maternal deaths.[4] High−risk and emergency management competence is a complex matter. Midwives′ roles incorporate the timely prevention, diagnosis, and management of complications; consultation with, and referral to, other services,[7] including ″the elements for basic emergency obstetric and neonatal care (BEmONC), i.e., assisted delivery, removal of retained products, manual removal of the placenta, administration of oxytocic drugs, antibiotics, anticonvulsants, and neonatal resuscitation.″[7(p.1132)]

Students refer to the admission policies and criteria, including physical and psychological protection, as well as the opportunities offered to help them achieve their learning objectives.[21] The literature highlights that personal commitment and strong support systems are crucial for students to complete undergraduate nursing and midwifery programs successfully.[24] Midwifery programs tend to attract highly motivated students.[25] Moreover, higher secondary school academic performance is a strong predictor of academic and clinical success in midwifery programs.[19] Students who develop the competencies recommended by the ICM can directly contribute to reducing maternal and neonatal mortality.[8]

This requires hands−on skills training, through high−quality pre−service midwifery education.[21,22]

The midwifery curriculum emphasizes the alignment of the education program with international standards and integrates key recommendations for midwifery education.[21,22,26] The ICM has developed core competencies for basic midwifery practice[26] and Global Standards for Midwifery Education,[21] emphasizing competency−based education (CBE). These standards allow midwife educators to align the curriculum with current developments and best practice.[26] A well−structured curriculum that allows sufficient time for hands−on practical training can lead to competence in both basic and emergency clinical tasks.[19] The effectiveness of the competency−based education approach for clinical skills has been investigated and verified in a range of evidence.[27] Nevertheless, CBE demands rigorous evaluation strategies. The objective structured clinical examination (OSCE), which facilitates a comprehensive assessment of both knowledge and skills, has been recognized as particularly valuable.[28]

Clinical teachers, supervisors, or preceptors are experienced and skilled midwives who actively practice midwifery and work closely with student midwives. Their role involves providing guidance, support, constructive feedback, and evaluation, while also serving as a role model for the student.[21] To guarantee that future midwives are well−prepared to provide high−quality, evidence−based care,[9] the midwifery teacher or supervisor must possess a high level of competence in both practical skills and theoretical knowledge.[21] Therefore, the quality of clinical education offered by midwife educators, along with the support provided by clinical staff, are the key factors influencing learning.[29] Studies have shown that regular and appropriate supervision and mentoring in clinical settings has a significant impact on midwifery students′ competencies.[12,30]

Practical clinical experience refers to the time students spend providing direct maternal and infant care, allowing them to acquire and apply the knowledge, skills, and behaviors necessary to become competent

midwives.[21] The clinical learning environment is widely acknowledged as a key factor in achieving successful outcomes.[31] A supportive practical training site is essential for fostering the development of professional competence, confidence, and identity in midwifery students.[32] Research suggests that increased hands-on practice and exposure to diverse birth scenarios during training significantly contribute to producing more skilled and confident professionals in obstetric care.[33] A diverse range of clinical settings may be required to ensure that each student receives the individualized learning experiences necessary, particularly considering the rarity of some clinical situations.[19,21]

Learning resources encompass the essential elements needed for quality midwifery education, including human resources, the physical aspects of the learning environment, teaching and learning materials, simulation models, and technical support for virtual or distance learning.[21] Research has shown that simulation laboratories provide consistent and high-quality learning opportunities for nursing and midwifery students, effectively preparing them to graduate as competent and highly skilled practitioners.[34] In contrast, inadequate resources were identified as contributing to ineffective clinical learning.[10] An international call for investment in midwifery education emphasizes the urgent need to strengthen healthcare systems by prioritizing the training and development of midwives.[9] Investing in midwifery education represents a cost-effective strategy to significantly enhance health outcomes for women and newborns.[9,11]

Therefore, in alignment with Johnson and colleagues'[19] framework and the existing literature, the development of a skilled and competent midwifery workforce is primarily facilitated through the provision of high-quality pre-service education. It was hypothesized that students, curriculum, practical clinical experience, learning resources, and support from clinical teachers and supervisors directly impact midwifery students' High-Risk/ Emergency Management Competence (HR/E-MC).

Study Aim

This study aimed to describe the level of competence of newly graduated midwives in Morocco to manage high-risk and emergency situations and the predictive factors of that competence.

Methods

Study Design: This was a cross-sectional study, using a descriptive and predictive design, and the study is reported here using the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement checklist.

Population and Sample: This study involved newly graduated midwives from six higher institutes of nursing professions and health techniques (HINPHT), located in two regions of Morocco: the Tanger-Tetouan and Fez-Meknes regions in the north and central parts of the country. All newly graduated midwives from these institutions (n = 197) were invited to participate in this study. The inclusion criterion was being from the most recent graduating class, regardless of working status as a qualified midwife. Participants were recruited using a convenience sampling method. The sample size appropriate for multiple regression was calculated using the rule recommended by Hair and colleagues,[35] which suggests 15 to 20 observations for each independent variable. In this study, there were five independent variables (students, curriculum, practical clinical experience, learning resources, and clinical teachers/supervisors' support). As increasing the ratio could significantly improve the predictive power of all the selected independent variables, all newly graduated midwives were invited to participate, with a final sample size of 186 participants.

Ethical Considerations: The study was conducted strictly following the principles outlined in the Helsinki Declaration. Approval was obtained from the six institutes. Additionally, ethical approval for the research was granted by Abdelmalek Essaâdi University, under the reference

number AC58JN. Prior to participation, all participants were fully informed about the study′s nature and purpose. Informed consent was obtained, and participants were assured of their right to withdraw from the study at any time without any consequence. Confidentiality and anonymity were strictly maintained throughout the research process. Importantly, the data were not shared with any managers, supervisors, or other administrative figures within the institution. Additionally, the information gathered was used solely for the purposes of the study and had no impact on the participants′ professional evaluations.

Instruments: Three questionnaires were developed by the primary investigator (PI) and used to collect the data: the Demographic Characteristics Questionnaire, the Pre−Service Education (PSE) Assessment Tool, and the Novice High−Risk/Emergency Management Competence Self−Assessment Tool (N−HR/E−MC). All questionnaires, except for the Demographic Characteristics Questionnaire, were pilot−tested with 30 newly graduated midwives who shared similar characteristics with the target population. Additionally, a survey was conducted with 20 midwifery educators and experts to ensure the applicability and validity of the two instruments. The content validity index of the questionnaires was calculated using a 4−point Likert scale (4 = highly relevant, 3 = quite relevant, 2 = somewhat relevant, 1 = not relevant).

The Demographic Characteristics Questionnaire has four items: age, gender, institute, and residence.

The Pre−Service Education (PSE) Assessment Questionnaire was specially designed for this study, based on the conceptual framework of pre−service education[19] and the international standards and guidelines for midwifery education.[21−23] The PSE−Q is designed to assess the predictive factors of HR/E−MC among newly graduated midwives. There are 53 items with five dimensions, including students (13 items), and an example item is: "My interest in the midwifery profession is very important." Curriculum (7 items), an item example is "The allocated time for clinical placements is sufficient to develop my competence in managing high−risk and emergency situations, as outlined in the training program." Clinical teachers/supervisors′ support (7 items), and an item example is "Midwifery educators provide opportunities for me to identify and undertake experiences that meet my learning needs." A practical clinical experience (14 items) item example is "I am authorized to provide direct care and manage high−risk and emergency situations in clinical settings." An example of learning resources (12 items) is "My institution has adequate equipment and simulators for high−risk and emergency simulation training." The PSE−Q is scored on a 5−point Likert scale (1 = completely disagree to 5 = completely agree). The total score ranges from 53 to 265, obtained by summing the scores for each item. The subscale scores are computed by dividing the total score of each subscale or dimension by the number of items in each subscale or dimension. A higher score indicates a greater perceived quality of pre−service midwifery education among the participants. The quality level was classified as low−quality education (25%), moderate−quality education (25%−75%), and high−quality education (75%) based on the total mean score. The content validity index (I−CVI) of the PSE−Q varied from 0.85 to 1.0 and the average S−CVI was 0.98 thus confirming its content validity. The Cronbach′s alpha in the pilot study was 0.89 and 0.96 in the actual study.

The Novice High−Risk/Emergency Management Competence Self−Assessment Tool (N−HR/E−MC) measures knowledge, skills, and behavior, as derived from the four domains of competence established by the ICM.[26] Items were adapted to the Moroccan context by using the Moroccan Competency−Based Curriculum to determine the list of risk management tasks that a Moroccan midwife should develop. The N−HR/E−MC scale contains a total of 43 items reflecting variables to measure the level of competence on managing high−risk and emergency situations among novice

midwives. This includes general competencies (8 items), of which an example item is "I can identify situations that require consultation or referral to other healthcare professionals." Antenatal HR/E-MC (9 items), an item example is "I can take up first-line management of high-risk pregnancies based on national guidelines." Intrapartum HR/E-MC (15 items), an item example is "I can manage the third stage of labour according to the national guidelines." Postpartum HR/E-MC (11 items), an item example is "I can take first-line measures to stabilise postpartum haemorrhage." The N-HR/E-MC scale is scored on a 5-point Likert scale ranging from 1 (not at all competent) to 5 (very competent). The total score, ranges from 43 to 215, and is obtained by summing the scores for each item. The subscale scores are computed by dividing the total score of each subscale or dimension by the number of items in each subscale or dimension. The level of competence is classified as low (25%), moderate (25%-75%), and high (75%) based on the total mean score. A higher score indicates a stronger self-assessment of HR/E-MC. The I-CVI of the N-HR/E-MC Questionnaire varied from 0.80 to 1.0. The average S-CVI was 0.97 thus confirming its content validity. Moreover, the tool demonstrated a high level of reliability, with an overall Cronbach's alpha value of 0.95 in the pilot study and 0.96 in the present study.

Data Collection: An anonymous online survey using Google Forms software was conducted from 31 July to 26 October 2021. One coordinator from each institute with an interest in the research was invited to assist with the online survey. The questionnaire includes the study's purpose, instructions for completion, and an emphasis on voluntary participation. To protect participant anonymity, the online survey was carefully designed to avoid collecting any personal identifying information. No details such as names, email addresses, and IP addresses were gathered. Furthermore, participants were not required to sign in or create an account to access the form, ensuring that their responses remained completely anonymous.

Data Analysis: Descriptive and inferential statistics were employed for data analysis, conducted using SPSS version 26.0. Frequencies, percentages, means, medians, ranges, and standard deviations were calculated for both the dependent and independent variables. Statistical significance was defined as a p-value of < 0.05. The correlation coefficients between the mean scores of the four subcategories of the N-HR/E-MC scale and the five predictive factors were calculated using Pearson's correlation analysis. According to Field,[36] correlations below 0.3 are considered small, those between 0.3 and 0.5 are deemed moderate to medium, and values exceeding 0.5 indicate a strong correlation. Stepwise multiple linear regression analyses were conducted to identify the most significant factors influencing HR/E-MC, followed by testing their statistical significance. To ensure the validity of the results, the assumptions required for multiple regression analysis were tested, including linearity, homoscedasticity, multicollinearity, and normality of the distribution. The test of Kolmogorov-Smirnov was greater than 0.05. The VIF values ranged from 1.02 to 1.7, and the tolerance statistics ranged from 0.45 to 0.99, indicating no collinearity within the data. The points on the Q-Q plot closely followed the straight diagonal line running from the bottom left to the top right, indicating that the assumption of linearity was met. The rectangular shape of the residuals on the normal scatterplot indicated that homoscedasticity was satisfied.

Results

Participants

A total of 186 participants were successfully surveyed, making a 94.41% response rate. All participants were female (100%), and 66.1 % were from urban settings. Their mean age ± SD was 24.12 ± 1.96 years. **Table 1** presents an overview of participants' demographic characteristics.

Table 1. General characteristics of the participants (N = 186)

Characteristics	Category	Frequency	Percentage
Age (years) (M = 24.12, SD = 1.96)			
Gender	Male	–	0.0
	Female	186	100.0
Institution of origin	Institute 1	30	16.1
	Institute 2	38	20.4
	Institute 3	27	14.5
	Institute 4	53	28.5
	Institute 5	25	13.4
	Institute 6	13	7.0
Residence	Rural	63	33.9
	Urban	123	66.1

Level of HR/E-MC among newly graduated midwives

Newly graduated midwives were moderately competent in managing high-risk and emergency situations (60.6% of the total score with an overall mean score + SD =129.58 + 30.53). The mean total score for HR/E-MC was 3.07 ± 0.72 from a total of 5. The highest mean score was for the general competencies, 3.27 ± 0.71, while the lowest mean score was for the intrapartum HR/E-MC, 2.94 ± 0.92 (**Table 2**).

Table 2. Description of study variables (N = 186)

Variables	Dimension score		Level	Mean item score of dimensions	
	Mean (SD)	Range		Mean (SD)	Range
HR/E-MC	129.58 (30.53)	64.02190.09	Moderate	3.07 (0.72)	1.58-4.51
Antenatal HR/E-MC	26.01 (7.43)	11.1139.56		3.14 (0.92)	1.33-4.80
Intrapartum HR/E-MC	41.46 (13.03)	18.2067.33		2.94 (0.92)	1.33-4.80
postpartum HR/E-MC	30.87 (8.21)	15.1846.45		3.06 (0.80)	1.55-4.64
General competencies	23.31 (5.04)	10.1332.63		3.27 (0.71)	1.38-4.63
Pre-service midwifery education	173.82 (46.84)	76.04241.08	Moderate	3.34 (0.89)	1.474.62
Students	40.08 (12.19)	17.0858.38		3.32 (1.00)	1.384.85
Curriculum	20.26 (6.55)	7.2929.57		3.31 (1.05)	1.294.71
Clinical teachers/supervisors' support	21.32 (5.23)	9.1429.71		3.48 (0.84)	1.434.86
Practical clinical experience	42.51 (12.84)	17.1460.36		3.25 (0.98)	1.364.64
Learning resources	37.68 (10.34)	14.0852.42		3.40 (0.92)	1.254.75

Note. HR/E-MC = High-risk/Emergency management competence

Factors associated with HR/E-MC among newly graduated midwives

The results showed that all five predictive factors were significantly positively correlated with the four dimensions of high-risk and emergency management competence (**Table 3**). Strong positive correlations were observed between the factors and overall HR/E-MC ($r = 0.745$ to $r = 0.798$), intrapartum HR/E-MC ($r = 0.771$ to $r = 0.804$), and postpartum HR/E-MC ($r = 0.682$ to $r = 0.722$). Moderate correlations were found with antenatal HR/E-MC ($r = 0.490$ to $r = 0.587$) and general competencies ($r = 0.388$ to $r = 0.464$).

Table 3. Correlation matrix of the study variables

Variables	1	2	3	4	5	6	7	8	9	10
HR/E-MC	–									
– Antenatal HR/E-MC	0.729**	–								
– Intrapartum HR/E-MC	0.951**	0.573**	–							
– Postpartum HR/E-MC	0.912**	0.510**	0.888**	–						
– General competencies	0.659**	0.333**	0.538**	0.515**	–					
Student	0.745**	0.490**	0.764**	0.686**	0.420**	–				
– Curriculum	0.762**	0.509**	0.779**	0.704**	0.423**	0.934**	–			
– Practical clinical experience	0.792**	0.547**	0.804**	0.722**	0.446**	0.939**	0.943**	–		
– Learning resources	0.745**	0.507**	0.771**	0.682**	0.388**	0.742**	0.736**	0.756**	–	
– Clinical teachers/ supervisors' support	0.798**	0.587**	0.788**	0.718**	0.464**	0.732**	0.732**	0.736**	0.761**	–

Note. HR/E-MC = High-risk/Emergency management competence; ** 0.001 (two-tailed test)

Factors predicting HR/E-MC among newly graduated midwives

Table 4 shows the results of a multiple linear regression analysis examining factors predicting HR/E-MC among 186 newly graduated midwives. Three models were tested, progressively adding predictors. The final model (Model 3) was statistically significant ($F = 5.063$, $p < 0.05$), showing that clinical teachers'/supervisors' support, practical clinical experience, and learning resources were significant predictors ($\beta = 0.404$, $p < 0.001$; $\beta = 0.384$ $p < 0.001$; and $\beta = 0.148$, $p < 0.05$, respectively). These factors together explained 73.2% (adjusted $R^2 = 0.732$) of the variance in midwives' competence in managing high-risk and emergency situations.

Table 4. Multiple linear regression analysis of factors predicting high-risk/emergency management competence (N = 186)

Model	Variables	B	SE	β	t	p-value	R^2	Adjusted R^2
1	Constant	0.703	0.136		5.172	< 0.001	0.638	0.636
	Clinical teachers'/supervisors' support	0.681	0.038	0.798	17.991	< 0.001		
2	Constant	0.607	0.118		5.127	< 0.001	0.729	0.726
	Clinical teachers'/supervisors' support	0.401	0.048	0.470	8.270	< 0.001		
	Practical clinical experience	0.329	0.042	0.447	7.861	< 0.001		
3	Constant	0.562	0.119		4.731	< 0.001	0.736	0.732
	Clinical teachers'/supervisors' support	0.345	0.054	0.404	6.375	< 0.001		
	Practical clinical experience	0.283	0.046	0.384	6.106	< 0.001		
	Learning ressources	0.115	0.051	0.148	2.250	0.026		
	R = 0.858, R^2 = 0.736, Adjusted R^2 = 0.732, Overall F = 5.063, p 0.05							

Note. Dependent variable: High-risk/Emergency management competence; Independent variable: Five essential inputs of PSE

Discussion

In this study Moroccan newly graduated midwives showed moderate HR/E-MC. The lowest mean score was reported for intrapartum skills, and the highest mean score was found for the general competencies. Similar result was documented in China by Wang and colleagues.[37] They reported that midwifery students demonstrated moderate core competencies, and recommended increasing opportunities for hands-on experience and clinical practice training. In Ethiopia, the overall proficiency in delivery care among midwifery students

was found to be inadequate.[12] Similarly, other studies conducted in Sweden[38] and Morocco[14] identified the need for further training and development of competence and confidence in complex and emergency situations for final−year and newly qualified midwives. The most significant predictors identified in the current study, ranked from the highest to lowest, were the support provided by clinical teachers and supervisors in the clinical environment, hands−on clinical experience, and learning resources. These three factors together explained a significant amount (73.2%) of the variance in the HR/E−MC. This finding may be attributed to the following reasons.

　　The support of clinical teachers and supervisors strongly and significantly predicted the participants′ HR/E−MC. This social gap between students and clinical supervisors is not unique to the Moroccan context and has been also observed in other countries.[39,40] Gessesse and colleagues[12] found that students who received regular supervision and mentoring at clinical sites were 2.5 times more competent in providing delivery care compared to those who lacked sufficient support from their supervisors. Furthermore, numerous studies have demonstrated that inadequate personal and academic support can have a significant impact on a student′s learning experience.[40] The clinical learning environment and supervisory support are crucial for fostering the clinical competence of future healthcare professionals. Evidence suggests that trained preceptors are essential for enhancing student confidence and competence.[30] Clinical support provided by midwives or preceptors who are trained for the role offers an opportunity for students to observe a skilled clinical role model in an authentic environment, which can enhance their competencies and confidence. Furthermore, this facilitates the transition from theoretical knowledge to practical skills, ensuring students are adequately prepared for the full range of midwifery roles.

　　The second factor significantly predicting the participants′ HR/E−MC was their practical clinical experience. Midwifery is a practice−based profession,

with evidence highlighting the clinical learning environment as a critical factor in achieving the desired outcomes.[29,41,42] A high−quality, practical clinical experience strengthens students′ knowledge and skills,[42] builds their confidence, and allows them to think critically.[41] Additionally, studies have emphasized that hands−on practice helps bridge the gap between theoretical knowledge and practical application, enabling students to gain the experiential learning necessary to perform competently and safely in their professional roles.[41,42] In this context, students foster professional behaviors, engage in authentic interactions, and cultivate meaningful relationships with women, families, and a multidisciplinary team of healthcare professionals.[22,31] Conversely, inadequate clinical education can lead to substandard practice and, in some instances, may result in errors that jeopardize patient safety.[14]

　　Learning resources were the third factor that significantly predicted the participants′ HR/E−MC. Competent teachers need resources and a working environment that supports and values them.[23] High−quality learning resources offer reliable learning opportunities for nursing and midwifery students, helping to prepare them to graduate as competent and highly skilled practitioners.[34] In contrast, the literature highlighted that lack of resources and supplies is a significant factor negatively impacting midwifery competence.[14,40,41] In obstetrics, emergencies can occur unexpectedly, leaving little time for teaching. Consequently, the literature recommends using simulation−based technology to address challenges in the clinical environment and improve proficiency in managing obstetric complications and emergencies.[14,34] Additionally, evidence shows that using simulation−based technology for obstetric emergencies in low− and middle−income countries (LMICs) directly contributes to achieving the United Nations Sustainable Development Goals.[34] In this regard, a global consensus has emerged, emphasizing that investment in midwifery education is essential to equip midwives with the necessary competencies to provide high−quality maternity care worldwide.[9,11] This includes ensuring that educational and clinical

institutions have the necessary resources and that faculty members are adequately prepared.[9,11]

Despite their importance, the relationship between learning resources and competence in this study was reduced compared to other factors, such as clinical teachers'/supervisors' support or practical clinical experience. This suggests that learning resources, in isolation, are inadequate for ensuring the acquisition of HR/E-MC competencies. The effective support provided by clinical educators, combined with hands-on experience through active engagement and experiential learning, is essential in enabling midwifery students to develop the competencies necessary for midwifery practice.

The lack of predictive contribution from student and curriculum factors in this study can be explained by several factors. First, human behaviour is influenced by a wide spectrum of variables, and the measures used in this study may not have fully captured the range of student characteristics necessary to reflect the complexity of this construct. Secondly, the low predictive contribution of the curriculum factor may be attributed to issues in its implementation. Therefore, even if the curriculum is well-designed, inconsistencies in its implementation[18] could account for its diminished predictive impact. Furthermore, it is important to consider the implications of using stepwise regression, particularly about the p-value thresholds used for variable selection. In this study, it is possible that the p-value threshold chosen ($p < 0.05$) was too conservative, leading to the exclusion of student and curriculum variables that may have had small but meaningful contributions. This reliance on statistical significance has resulted in a model that is statistically optimal but not necessarily aligned with the broader theoretical framework. Future studies may better capture the underlying contributions of excluded variables, even when their individual predictive power is less pronounced.

This study provides valuable insights and shows that midwifery HR/E-MC is seriously threatened by clinical teachers'/supervisors' support, practical clinical experience, and learning resources. Therefore, the

implementation of a competence-based training programme as an independent action is not sufficient to achieve the intended results. Eventually, midwifery educators and supervisors need specific skills and equipment for this role. The study advocates a holistic approach to engineering education, with an emphasis on improving the teaching skills of academic and clinical midwifery educators, development of pedagogical tools to support student centred learning, and equipping institutes with appropriate learning resources.

Limitations

The results presented in this study are based on the perceptions of new graduates. As such, the findings may not fully capture the complexity of the issue or provide a comprehensive understanding of the factors affecting HR/E-MC. Further research is needed, incorporating feedback from a broader range of stakeholders, such as clinical educators, supervisors, clinical midwives and healthcare administrators, to achieve a more well-rounded and objective assessment. Additionally, the assessment of HR/E-MC was based on self-assessment data. The use of other methods of inquiry, such as qualitative methods and direct observation in the real ward, may provide further data. Moreover, the study was limited to two regions of Morocco, involving six Higher Institutes of Nursing Professions and Health Techniques (HINPHT) institutes, whereas there are 24 such institutes across the country. This limitation reduces the generalizability of the study's findings.

Conclusion and Implications for Education and Research

This study demonstrates that developing competence in managing high-risk and emergencies during undergraduate midwifery education is a complex process influenced by multiple factors. Stepwise multiple linear regressions revealed strong relationships between clinical teachers'/supervisors' support, practical clinical

experience, learning resources, and the HR/E−MC with an explanatory power of 73.2%. Thus, academic midwifery educators, supervisors in the healthcare system, and policymakers should collaborate to prepare a quality workforce. Midwifery educators should focus on developing students' HR/E−MC by identifying areas for improvement and tailoring interventions to available resources and supplies. Therefore, we recommend extending the duration of practical clinical experience by offering midwifery students extended, uninterrupted time in clinical settings. This will enable them to engage in a greater number of real−world scenarios. Moreover, incorporating methods such as simulation training enables students to engage with and respond to high−risk scenarios, thereby enhancing their readiness to manage emergencies.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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ปัจจัยทำนายและระดับสมรรถนะในการจัดการความเสี่ยงสูง/เหตุฉุกเฉินในพยาบาลผดุงครรภ์ที่เพิ่งสำเร็จการศึกษาในโมร็อกโก : การศึกษาวิจัยภาคตัดขวาง

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บทคัดย่อ: การศึกษาพยาบาลผดุงครรภ์เป็นพื้นฐานที่สำคัญอย่างยิ่งต่อการรับรองว่าพยาบาลผดุงครรภ์มีทักษะที่เหมาะสมในการจัดการสถานการณ์วิกฤต และด้วยเหตุนี้จึงป้องกันการเสียชีวิตของมารดาและทารกแรกเกิดได้.ในการบรรลุเป้าหมายการพัฒนาอย่างยั่งยืน (SDGs) ข้อ 4 และ 5 ภายในปี พ.ศ. 2573 และเสริมสร้างบทบาททางวิชาชีพของพยาบาลผดุงครรภ์นั้น โมร็อกโกได้นำโปรแกรมการฝึกอบรมอิงสมรรถนะมาใช้ การศึกษาครั้งนี้มีวัตถุประสงค์เพื่ออธิบายระดับสมรรถนะในการจัดการสถานการณ์ความเสี่ยงสูง/เหตุฉุกเฉิน และปัจจัยในการทำนายสมรรถนะของพยาบาลผดุงครรภ์ที่เพิ่งสำเร็จการศึกษา มีการสำรวจออนไลน์โดยไม่เปิดเผยตัวตนระหว่างวันที่ 31 กรกฎาคม ถึง 26 ตุลาคม พ.ศ. 2564 ในพยาบาลผดุงครรภ์ที่เพิ่งสำเร็จการศึกษา 186 คน รวบรวมข้อมูลโดยใช้แบบสอบถามลักษณะประชากร แบบประเมินการจัดประสบการณ์การฝึกหัดผดุงครรภ์ และเครื่องมือประเมินตนเองด้านสมรรถนะในการจัดการความเสี่ยงสูง/ฉุกเฉินสำหรับมือใหม่ วิเคราะห์ข้อมูลโดยใช้โปรแกรมสถิติสำเร็จรูป SPSS เวอร์ชัน 26.0 ใช้สถิติการวิเคราะห์สหสัมพันธ์ของเพียร์สันใช้เพื่อศึกษาความสัมพันธ์ระหว่างสมรรถนะในการจัดการความเสี่ยงสูง/ฉุกเฉินและปัจจัยทำนาย และสถิติการวิเคราะห์สมการถดถอยพหุคูณแบบเป็นขั้นตอน ในการศึกษาปัจจัยที่มีอิทธิพลต่อสมรรถนะฯ

ผลการศึกษาพบว่าพยาบาลผดุงครรภ์ชาวโมร็อกโกที่เพิ่งสำเร็จการศึกษามีสมรรถนะระดับปานกลางในการจัดการสถานการณ์ความเสี่ยงสูงและเหตุฉุกเฉิน และปัจจัยด้านการสนับสนุนที่ไม่เพียงพอจากอาจารย์และหัวหน้างาน ประสบการณ์ทางคลินิกในการปฏิบัติงานที่จำกัด และการขาดทรัพยากรการเรียนรู้ เป็นปัจจัยทำนายสมรรถนะที่มีนัยสำคัญในการจัดการความเสี่ยงสูง/ฉุกเฉิน ซึ่งอธิบายความแปรปรวนของสมรรถนะในการจัดการความเสี่ยงสูง/ฉุกเฉินได้ร้อยละ 73.2 ผลการวิจัยนี้สอดคล้องกับสถาบันการศึกษาต่างๆทั่วโลกซึ่งชี้ให้เห็นว่าประเด็นนี้เป็นความท้าทายที่พบบ่อย ดังนั้น การดำเนินการจัดโปรแกรมการฝึกอบรมอิงสมรรถนะในฐานะการปฏิบัติอิสระที่ไม่อยู่ภายใต้การสนับสนุนจากผู้อื่นจึงไม่เพียงพอที่จะบรรลุผลตามที่ตั้งเป้าไว้ การเสริมสร้างศักยภาพของอาจารย์และหัวหน้างานด้านการผดุงครรภ์และการตอบสนองต่อเสียงเรียกร้องจากนานาชาติด้านการเพิ่มทรัพยากรในการศึกษาการผดุงครรภ์ทั้งในด้านวิชาการและการปฏิบัติทางคลินิก ถือเป็นขั้นตอนสำคัญในการพัฒนาสมรรถนะของผดุงครรภ์

คำสำคัญ: สมรรถนะ การศึกษาอิงสมรรถนะ การจัดการเหตุฉุกเฉิน ความเสี่ยงสูง ผดุงครรภ์ อาจารย์ผดุงครรภ์ ผู้สำเร็จการศึกษาใหม่ หัวหน้างาน

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