Original Article

The Work Environment and Its Influence on the Management of Imminent Childbirths by Midwives in Morocco: An Ecosystemic Approach to Maternal Health

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ABSTRACT

Objectives

This cross-sectional descriptive study, conducted amongst 247 midwives in the Rabat-Salé-Kenitra region (Morocco), evaluates the influence of the professional environment on the management of imminent childbirths. The ecosystemic approach adopted considers the work environment as a major determinant of obstetric care quality.

Result

Results reveal that whilst 63% of participants received specific training, only 38% feel fully prepared to manage these emergency situations. Multivariate analysis identifies professional experience (adjusted OR=5.42; 95% CI: 2.73-10.76; p<0.001) and regular access to resources (adjusted OR=3.78; 95% CI: 1.95-7.34; p<0.001) as independent predictors of perceived preparedness. Work overload (adjusted OR=0.41; 95% CI: 0.24-0.71; p=0.002) and absence of protocols (adjusted OR=0.35; 95% CI: 0.16-0.78; p=0.009) are significantly associated with lower professional confidence.

Conclusion

These findings highlight the importance of a holistic approach integrating workplace environment optimisation, professional skills enhancement, and infrastructure improvement to ensure safe and sustainable obstetric care.

Keywords

professional environment; midwives ;imminent childbirth; healthcare ecosystem; sustainable development; maternal health; Morocco.

INTRODUCTION

The quality of obstetric care represents a fundamental issue in public health and sustainable development, particularly in resource-limited countries where maternal mortality remains a persistent challenge [1,2]. Imminent childbirth, an obstetric emergency characterised by rapid labour and impending

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birth outside optimal hospital conditions, constitutes a relevant indicator of health system resilience and the adaptation of professionals to their work environment[3].

From an ecosystemic perspective, the professional environment of midwives represents much more than a simple physical framework: it constitutes a complex system of interactions between human, material, organisational, and sociocultural factors [4,5]. This holistic approach, aligned with the principles of sustainable development applied to health, enables us to comprehend the multidimensional determinants of obstetric care quality.

The professional environment in which midwives operate directly influences their ability to effectively manage emergency situations[6]. Material conditions (equipment, medicines, infrastructure), service organisation (protocols, decision-making hierarchy, patient pathways), workload (staff-to-patient ratio), access to updated information, and hierarchical supervision constitute a professional ecosystem whose balance determines the quality of care provided [7].

The sustainability of maternal health systems relies on this ecosystemic understanding of interactions between professionals and their environment[8]. A favourable work environment, characterised by clear protocols, a culture of interdisciplinary collaboration, and adequate resources, allows not only better anticipation of high-risk situations but also optimal patient support, thus contributing to the Sustainable Development Goals (SDGs) related to maternal health and well-being [9,10].

This study aims to analyse, from an environmental perspective, the factors influencing the ability of Moroccan midwives to manage imminent childbirths. Through a survey conducted in the Rabat-Salé-Kenitra region, it proposes to identify the interactions between training, professional experience, and work environment characteristics, to contribute to the development of sustainable maternal health policies adapted to the local context [11].

METHODOLOGY

Study Type

This research is framed as a cross-sectional descriptive study, conducted in the Rabat-Salé-Kenitra region (Morocco) amongst midwives practising in public and private healthcare establishments.

Population and Sampling

Inclusion criteria: midwives practising in the Rabat-Salé-Kenitra region, in public or private settings, with at least one year of professional experience and voluntarily agreeing to participate in the study.

Exclusion criteria: midwives in training, trainees, or those not meeting the minimum conditions of experience or geographical location.

The target population includes all practising midwives with at least one year of professional experience. A non-probabilistic convenience sampling approach was adopted, resulting in a total of 247 participants.

Data Collection Tools

A self-administered questionnaire was distributed via Google Forms, developed using an ecosystemic approach integrating environmental dimensions (working conditions, resource availability, service organisation). It included closed items (multiple-choice) concerning the attitudes, knowledge, and practices of midwives facing imminent childbirth, with particular attention to environmental factors influencing their capacity for action.

Statistical Analysis Methods

Data were analysed using SPSS version 25.0 software. Descriptive statistics (frequencies, percentages) were calculated for categorical variables. Bivariate analyses were performed to evaluate associations between variables. Crude odds ratios (OR) with their 95% confidence intervals (95% CI) were calculated to quantify the strength of associations. Multivariate analysis using logistic regression was performed to identify independent predictors of perceived preparedness, adjusting for potential confounding factors. Correlation coefficients were calculated to evaluate relationships between ordinal variables. The threshold for statistical significance was set at $p<0.05$.

Ethical Clearence

The study adheres to ethical principles related to research involving human subjects and is framed within a perspective of sustainable development of maternal health. The questionnaire was anonymous, participation was voluntary, and no personally identifiable information was collected. Informed consent was implicitly validated by completing the questionnaire.

RESULTS

The analysis of data involved 247 valid responses.

Results are presented using an ecosystemic approach, highlighting the interactions between the professional characteristics of midwives and their work environment.

Table 1. Professional characteristics of participants (n=247)

Characteristic	Category	Number (n)	Percentage (%)
Professional experience	Less than 2 years	104	42.0
	Between 2 and 5 years	94	38.0
	More than 5 years	49	20.0
Type of practice	Hospital	225	91.0
	Private practice	18	7.3
	Other structures	4	1.7
Establishment level	University hospital centre	67	27.1
	Provincial hospital	112	45.3
	Health centre	46	18.6
	Private structure	22	9.0

Interpretation: the majority of respondents are young hospital midwives, with less than five years of experience (80%), working mainly in provincial or university hospitals (72.4%), which underscores the importance of an adapted work environment to support their professional development.

Table 2. Specific training and access to environmental resources (n=247)

Variable	Modality	Number (n)	Percentage (%)
Specific training received	Yes	156	63.0
	No	91	37.0
Type of training received	Initial training only	91	37.0
	Continuing education in establishment	83	33.5
	External certified training	52	21.0
	Self-training	21	8.5
Frequency of access to updated resources	Never	49	20.0
	Rarely (1-2 times/year)	121	49.0
	Regularly (3-5 times/year)	52	21.0
	Very regularly (6+ times/year)	25	10.0
Information sources used	Institutional protocols	87	35.2
	Professional journals	42	17.0
	Online training	63	25.5
	Exchanges between colleagues	156	63.2
	Scientific databases	27	11.0

Interpretation: whilst 63% of participants have received specific training, regular access to updated resources remains limited (only 31%), with a predominance of informal exchanges between colleagues as an information source (63.2%), revealing environmental inequalities in access to structured professional information.

Table 3. Bivariate analysis of factors associated with perceived preparedness for imminent childbirth (n=247)

Variable	Modality	Adequate preparation n (%)	Inadequate preparation n (%)	Crude OR (95% CI)	p-value
Professional experience	< 2 years	32 (30.8)	72 (69.2)	1.00 (reference)	<0.001
	2-5 years	37 (39.4)	57 (60.6)	1.46 (0.81-2.63)	
	> 5 years	37 (75.5)	12 (24.5)	6.94 (3.19-15.10)	
Specific training	No	19 (20.9)	72 (79.1)	1.00 (reference)	<0.001
	Yes	75 (48.1)	81 (51.9)	3.50 (1.94-6.32)	
Access to resources	Never/Rarely	42 (24.7)	128 (75.3)	1.00 (reference)	<0.001
	Regularly	52 (67.5)	25 (32.5)	6.34 (3.53-11.38)	

Variable	Modality	Adequate preparation n (%)	Inadequate preparation n (%)	Crude OR (95% CI)	p-value
Absence of protocols	No	87 (41.8)	121 (58.2)	1.00 (reference)	0.003
	Yes	7 (17.9)	32 (82.1)	0.30 (0.13-0.71)	
Work overload	No	68 (50.0)	68 (50.0)	1.00 (reference)	<0.001
	Yes	26 (23.4)	85 (76.6)	0.31 (0.17-0.54)	
Supervision available	No	55 (30.1)	128 (69.9)	1.00 (reference)	<0.001
	Yes	39 (60.9)	25 (39.1)	3.63 (2.00-6.58)	
Adequate equipment	No	41 (25.6)	119 (74.4)	1.00 (reference)	<0.001
	Yes	53 (60.9)	34 (39.1)	4.52 (2.58-7.93)	

Interpretation: bivariate analysis reveals statistically significant associations between perceived preparedness and several environmental and professional factors. Experienced midwives (OR=6.94), those having received specific training (OR=3.50), having regular access to resources (OR=6.34), benefiting from supervision (OR=3.63), and having adequate equipment (OR=4.52) present significantly higher odds of feeling prepared. Conversely, the absence of protocols (OR=0.30) and work overload (OR=0.31) significantly reduce this probability.

Table 4. Multivariate analysis of factors independently associated with perceived preparedness (Logistic regression, n=247)

Variable	Modality	Adjusted OR (95% CI)	p-value
Professional experience	< 2 years	1.00 (reference)	-
	2-5 years	1.83 (0.94-3.57)	0.076
	> 5 years	5.42 (2.73-10.76)	<0.001
Specific training	No	1.00 (reference)	-
	Yes	2.31 (1.18-4.52)	0.015
Access to resources	Never/Rarely	1.00 (reference)	-
	Regularly	3.78 (1.95-7.34)	<0.001
Absence of protocols	No	1.00 (reference)	-
	Yes	0.35 (0.16-0.78)	0.009
Work overload	No	1.00 (reference)	-
	Yes	0.41 (0.24-0.71)	0.002
Supervision available	No	1.00 (reference)	-
	Yes	1.94 (0.98-3.84)	0.057
Adequate equipment	No	1.00 (reference)	-
	Yes	2.67 (1.41-5.06)	0.003

Interpretation: after adjustment for all covariates, five factors remain independently associated with perceived preparedness: professional experience greater than 5 years (adjusted OR=5.42), specific training (adjusted OR=2.31), regular access to resources (adjusted OR=3.78), adequate equipment (adjusted OR=2.67), whilst the absence of protocols (adjusted OR=0.35) and work overload (adjusted OR=0.41) remain factors significantly associated with lower perceived preparedness. Available supervision shows a positive but non-significant trend (p=0.057).

Table 5. Correlation matrix between environmental variables and perceived preparedness (n=247)

Variables	1	2	3	4	5	6	7	8
1. Perceived preparedness	1.000							
2. Professional experience	0.431**	1.000						
3. Specific training	0.347**	0.215**	1.000					
4. Access to resources	0.382**	0.196**	0.279**	1.000				
5. Absence of protocols	-0.312**	-0.087	-0.157*	-0.242**	1.000			
6. Work overload	-0.376**	-0.103	-0.142*	-0.218**	0.293**	1.000		
7. Supervision available	0.298**	0.112	0.246**	0.352**	-0.187**	-0.201**	1.000	
8. Adequate equipment	0.359**	0.093	0.183**	0.316**	-0.245**	-0.283**	0.387**	1.000

*Note: * $p<0.05$; ** $p<0.01$*

Interpretation: the correlation matrix reveals significant associations between perceived preparedness and all environmental variables studied. The strongest correlations are observed with professional experience (r=0.431), access to resources (r=0.382), and adequate equipment (r=0.359). Significant negative correlations are observed with work overload (r=-0.376) and absence of protocols (r=-0.312). Significant intercorrelations are also noted between the different environmental variables, suggesting complex interactions within the professional ecosystem.

Table 6. Attitudes and priorities in case of imminent childbirth: stratified analysis according to level of perceived preparedness (n=247)

Variable	Modality	Adequate preparation (n=94)	Inadequate preparation (n=153)	OR (95% CI)	p-value
First declared action	Vaginal examination	73 (77.7%)	95 (62.1%)	2.12 (1.18-3.79)	0.011
	Other actions	21 (22.3%)	58 (37.9%)	1.00 (reference)	
Main priority	Foetal monitoring	78 (83.0%)	100 (65.4%)	2.58 (1.38-4.85)	0.003
	Other priorities	16 (17.0%)	53 (34.6%)	1.00 (reference)	
Confidence in decision-making ability	High	81 (86.2%)	72 (47.1%)	7.00 (3.61-13.57)	<0.001
	Low/Medium	13 (13.8%)	81 (52.9%)	1.00 (reference)	
Stress experienced	Low	58 (61.7%)	41 (26.8%)	4.40 (2.55-7.59)	<0.001
	Moderate/High	36 (38.3%)	112 (73.2%)	1.00 (reference)	
Self-assessment of technical skills	Satisfactory	76 (80.9%)	59 (38.6%)	6.73 (3.68-12.30)	<0.001
	Insufficient	18 (19.1%)	94 (61.4%)	1.00 (reference)	

Interpretation: stratified analysis shows significant differences in attitudes and priorities according to the level of perceived preparedness. Midwives feeling well-prepared are significantly more likely to prioritise vaginal examination as their first action (OR=2.12), to prioritise foetal monitoring (OR=2.58), to have confidence in their decision-making ability (OR=7.00), to experience less stress (OR=4.40), and to positively self-assess their technical skills (OR=6.73). These results highlight the impact of perceived preparedness on the potential quality of emergency obstetric care.

Table 7. Multivariate analysis of environmental factors predictive of confidence in decision-making ability (Logistic regression, n=247)

Predictor	β	Standard error	Adjusted OR (95% CI)	p-value
Experience > 5 years	1.372	0.413	3.94 (1.76-8.84)	0.001
Specific training	0.683	0.285	1.98 (1.13-3.46)	0.017
Regular access to resources	0.957	0.311	2.60 (1.42-4.79)	0.002
Absence of protocols	-0.921	0.384	0.40 (0.19-0.84)	0.016
Work overload	-0.811	0.282	0.44 (0.26-0.77)	0.004
Supervision available	0.712	0.325	2.04 (1.08-3.86)	0.029
Adequate equipment	0.842	0.294	2.32 (1.30-4.13)	0.004
Constant	-0.583	0.255	0.558	0.022

Note: Nagelkerke $R^2 = 0.397$

Interpretation: the multivariate logistic regression model identifies seven independent predictors of confidence in decision-making ability, explaining 39.7% of its variance. Positive environmental factors include experience greater than 5 years (adjusted OR=3.94), regular access to resources (adjusted OR=2.60), adequate equipment (adjusted OR=2.32), available supervision (adjusted OR=2.04), and specific training (adjusted OR=1.98). Negative factors include the absence of protocols (adjusted OR=0.40) and work overload (adjusted OR=0.44).

DISCUSSION

This study highlights the crucial importance of the professional environment as a determinant of the quality of emergency obstetric care in Morocco. The ecosystemic approach adopted allows us to move beyond the reductive vision focused solely on individual skills to comprehend the complex interactions between professionals and their work environment.

The results confirm the existence of significant challenges in the professional ecosystem of Moroccan midwives. The perception of insufficient preparation, despite specific training, underscores the limitations of current pedagogical approaches and the determining influence of the work environment. These observations align with the principles of sustainable development applied to health, which recognise the interdependence between quality of care, working conditions, and the sustainability of health systems.

Several recent studies have demonstrated that theoretical preparation alone is not sufficient: clinical simulation, access to updated resources, repetition of technical gestures, and structured supervision constitute essential components of a favourable professional ecosystem[12,13]. Our results, by identifying significant correlations between environmental factors and feelings of preparedness, confirm these observations in the Moroccan context.

The results obtained in the Rabat-Salé-Kenitra region align with previous conclusions that have shown that continuing education and professional supervision are key factors in mastering emergency obstetric situations [14]. The environmental dimension appears as an essential variable: professionals working in contexts where protocols are available, resources are updated, and supervision is effective, feel significantly better prepared[15]. These findings corroborate observations documenting significant regional variations in the professional environments of Moroccan midwives [16].

From a sustainable development perspective, optimising the work environment of midwives represents a strategic investment for health systems. The negative relationships observed between certain unfavourable environmental factors (understaffing, absence of protocols) and the feeling of preparedness underscore the urgency of systemic interventions aimed at improving the working conditions of maternal health professionals. A recent

study demonstrated that environmental barriers often constitute the main obstacle to effective obstetric care, beyond individual skills [17].

Previous research has also highlighted the shortcomings of the clinical learning environment for student midwives and recent graduates [18]. These structural limitations directly influence the quality of care and the sense of self-efficacy. Our study, by finding positive associations between certain work environment indicators and perceived preparedness, confirms the relevance of these findings in the regional context and underscores the importance of an ecosystemic approach to obstetric care.

The practical implications of this research are multiple from a sustainable development perspective. It becomes urgent to strengthen contextualised continuing education mechanisms, to introduce simulation in maternal health training plans, and to formalise access to standardised protocols in maternity wards, as recommended by some studies on obstetric simulation [19]. The professional environment, long relegated to the background in training policies, must be reconceived as a central determinant of the quality and sustainability of emergency obstetric care[20,21].

The protocol-based approach to obstetric emergencies offers a promising avenue for improving the decision-making environment of midwives[22]. Indeed, our results show that the absence of clear protocols significantly reduces the feeling of preparedness (adjusted OR=0.35), confirming the importance of formalised frameworks for action to secure professional practices.

Furthermore, ecosystemic interventions conducted in other contexts demonstrate that an integrated approach, simultaneously targeting training, work environment, and available resources, can significantly improve the preparedness of midwives for emergency situations [23]. This holistic perspective aligns with our results which identify multiple interdependent environmental factors influencing the professionals' capacity for action.

CONCLUSION

This study, adopting an ecosystemic approach to maternal health, has highlighted the determining influence of the professional environment on the ability of midwives to manage imminent childbirths in the Rabat-Salé-Kenitra region. The results demonstrate that the quality of emergency obstetric care depends not only on individual skills but also on a set of interconnected environmental factors.

From a perspective of sustainable development of maternal health systems, it is strongly recommended to:

1. **Optimise the professional ecosystem** by ensuring adapted working conditions, sufficient staffing, and service organisation that promotes quality care.
2. **Strengthen access to environmental resources** (updated protocols, adequate equipment, scientific documentation) for all midwives, particularly in less favoured areas.
3. **Integrate clinical simulation devices** in initial and continuing training, allowing the recreation of realistic practice environments and improving preparedness for emergency situations.
4. **Develop formative supervision** based on support rather than control, thus creating an environment of continuous learning.
5. **Adopt a holistic approach** recognising the interdependence between quality of care, professional well-being, and sustainability of health systems.

These recommendations are framed within an ecosystemic vision of maternal health, where improving the environmental conditions of professional practice constitutes a strategic lever for achieving the Sustainable Development Goals related to maternal and child health. Public health decision-makers, educational leaders, and health establishment managers must collaborate to build a professional ecosystem conducive to the flourishing of midwives and patient safety, thus contributing to the sustainability and equity of maternal health systems in Morocco [24, 25].

An ecosystemic approach to obstetric emergencies demonstrates that an effective policy must simultaneously integrate training, work environment, and resources [24]. Similarly, the determining impact of the work environment on the attitudes of midwives facing emergency situations confirms the relevance of interventions targeting the professional ecosystem as a whole [25].

Consent for Publication

The author reviewed and approved the final version and has agreed to be accountable for all aspects of the work, including any accuracy or integrity issues.

DISCLOSURE

The author declares that they do not have any financial involvement or affiliations with any organization, association, or entity directly or indirectly related to the subject matter or materials presented in this review paper. This includes honoraria, expert testimony, employment, ownership of stocks or options, patents, or grants received or pending royalties.

Data Availability

Information for this review paper is taken from freely available sources.

Authorship Contribution

All authors contributed significantly to the work, whether in the conception, design, utilization, collection, analysis, and interpretation of data or all these areas. They also participated in the paper's drafting, revision, or critical review, gave their final approval for the version that would be published, decided on the journal to which the article would be submitted, and made the responsible decision to be held accountable for all aspects of the work.

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