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Work Environment Mediates the Association Between Work Facilities and Midwives' Performance

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ABSTRACT: Exclusive breastfeeding coverage remains below target in many settings, while evidence on whether physical work facilities directly improve midwives' performance is inconclusive. Organisational conditions may determine whether available facilities are translated into better service delivery. To examine the association between work facilities and midwives' performance and test whether the work environment mediates that relationship in the exclusive breastfeeding programme. A cross-sectional survey included 119 midwives from 19 public health centres in Muna Regency, Indonesia. Work facilities, work environment and programme performance were measured with five-point Likert scales. The reported coefficients were estimated in the complete dissertation model using partial least squares structural equation modelling and bootstrapping in SmartPLS 4. Work facilities were not directly associated with performance ($\beta = 0.058$; $p = 0.488$). Facilities were positively associated with the work environment ($\beta = 0.479$; $p < 0.001$), and the work environment was positively associated with performance ($\beta = 0.460$; $p = 0.006$). The indirect facilities-work environment-performance path was significant ($\beta = 0.220$; $p = 0.014$). Facilities functioned as enabling resources whose performance value depended on the environment in which they were used. Facility investment should therefore be combined with clear work organisation, supportive supervision, teamwork, communication and reliable logistics.

1. INTRODUCTION

Exclusive breastfeeding for the first six months is a core maternal and child health intervention. Globally, only about 48% of infants younger than six months are exclusively breastfed, below the World Health Assembly target of 60% by 2030 (1,2). Indonesia reported 55.5% coverage in 2023, whereas Southeast Sulawesi reached 41.9% (3). Programme records reviewed for this study showed a sharper local decline in Muna Regency, from 41.7% in 2023 and 46.55% in 2024 to 18.27% in 2025. This trend indicates a persistent implementation gap rather than a lack of policy attention.

Midwives are central to closing this gap because they provide antenatal education, support early initiation of breastfeeding, counsel mothers after birth, monitor feeding practices and document programme outcomes. Their performance is shaped by professional competence, but also by staffing, leadership, organisational support, workplace relationships and access to functional resources (4,5,6). Improving performance therefore requires attention to the conditions under which midwives deliver care.

Work facilities include consultation rooms, lactation spaces, infant weighing equipment, educational media, recording tools, supplies and technical support. These resources can reduce delays and make services safer and more consistent. However, the literature increasingly shows that the physical environment affects staff through intermediate processes such as communication,

coordination, wellbeing and workflow, rather than producing uniform performance gains by its mere presence (7,8). Facilities that are unavailable, poorly maintained or disconnected from service routines may have little practical effect.

The work environment captures those intermediate organisational and psychosocial conditions. In this study it comprised work structure, responsibility, managerial attention and support, intergroup cooperation and communication. Positive practice environments have been associated with job satisfaction, work engagement, retention, service quality and performance among nurses and midwives (9,10,11). From a Job Demands-Resources perspective, facilities are useful job resources when they reduce obstacles and allow staff to work in a predictable, collaborative and supportive system.

Most previous studies have examined facilities and the work environment as separate predictors. Evidence is limited on whether the work environment is the mechanism through which facilities influence midwives' programme performance, particularly in primary health care in rural and island settings. This study addresses that gap by testing three linked relationships: work facilities to performance, work facilities to the work environment, and the work environment to performance. It also tests the indirect effect of work facilities on performance through the work environment.

2. MATERIALS AND METHODS

2.1 Design and Setting

This quantitative cross-sectional study was conducted in 19 public health centres in Muna Regency, Southeast Sulawesi, Indonesia. The regency includes urban, rural, coastal and inland service areas, with variation in access, logistics and health-service delivery. Data collection formed part of a doctoral study conducted from November 2025 to June 2026.

2.2 Population and Sample

The study population comprised 171 midwives working across 19 public health centres in Muna Regency. The target sample of 119 midwives was allocated proportionally to the number of eligible midwives in each centre, resulting in three to eight participants per facility. Eligibility screening was applied before the centre-specific allocation was completed. Eligible participants were actively employed in maternal and child health or exclusive breastfeeding services, had at least two years of service, were actively working during the study period and agreed to participate. Midwives on extended leave or study assignment and those unavailable during data collection were excluded. This approach ensured representation from all 19 public health centres while maintaining the population distribution across service locations.

2.3 Measures

Data were collected using a self-administered questionnaire with a five-point Likert response scale ranging from 1 (strongly disagree/never) to 5 (strongly agree/always), with higher scores indicating more favourable perceptions. The instrument was developed for the broader doctoral study by operationalising each construct into service-relevant dimensions. Work facilities comprised physical space and workspace, equipment and educational materials, access to resources and logistical support, cleanliness and sanitation, and stock/logistics procedures and technical support. The work environment comprised work structure, responsibility, managerial attention and support, intergroup cooperation, and communication. Midwives' performance comprised achievement of clinical programme tasks, service quality and client safety, work efficiency and workload management, response to feedback and continuous improvement, and initiative, innovation and quality improvement.

A preliminary instrument test was conducted with 30 respondents outside the main analytic sample. The doctoral study reported item-total correlations above the predetermined screening threshold and high internal consistency before the main survey. In the final PLS-SEM measurement model, convergent validity and reliability were assessed using indicator loadings, Cronbach's alpha, composite reliability and average variance extracted (AVE), while discriminant validity was evaluated using the heterotrait-monotrait ratio (HTMT). The prespecified criteria were loadings > 0.70 , Cronbach's alpha and composite reliability > 0.70 , AVE > 0.50 and HTMT < 0.90 (13).

2.4 Data Analysis

Descriptive statistics summarised participant characteristics and construct scores. Partial least squares structural equation modelling was performed in SmartPLS 4 (12). The measurement model was evaluated against the prespecified reliability and validity criteria described above. Structural paths were assessed using standardised path coefficients and bootstrapped p-values, with $p < 0.05$ indicating statistical significance. Mediation was evaluated from the specific indirect effect of work facilities on

performance through the work environment. A statistically significant specific indirect effect was considered evidence of mediation; when the indirect effect was significant while the direct work facilities-performance path was not significant, the pattern was interpreted as indirect-only mediation (13).

This article reports a focused subset of paths from the complete dissertation model. The coefficients were estimated while the other constructs in that model - transformational leadership, job satisfaction and professional identity - remained included. The analysis therefore preserves the original model specification while limiting the present interpretation to the facilities-work environment-performance mechanism.

3. RESULTS AND DISCUSSION

3.1 Participant Characteristics

All 119 sampled midwives completed the survey. Most were 31-40 years old (75.6%), held a diploma qualification (81.5%), had 10-19 years of service (50.4%) and were civil servants (54.6%). Participants were distributed across all 19 public health centres, with three to eight respondents per facility, reflecting the proportional centre-level allocation.

Table 1. Characteristics of participants (n = 119)

Characteristic	Category	n	%
Age (years)	≤30	11	9.2
	31-40	90	75.6
	41-50	10	8.4
	51-60	8	6.7
Education	Diploma (D3/D4)	97	81.5
	Professional/Bachelor	18	15.1
	Master	4	3.4
Length of service (years)	≤9	45	37.8
	10-19	60	50.4
	20-29	9	7.6
	30-39	5	4.2
Employment status	Civil servant	65	54.6
	Government contract	4	3.4
	Part-time government contract	50	42.0

3.2 Measurement Model

Mean scores were 4.04 for work facilities, 4.27 for the work environment and 4.23 for performance. All indicator loadings exceeded the recommended 0.70 threshold: 0.780-0.867 for work facilities, 0.723-0.844 for the work environment and 0.786-0.914 for performance. Cronbach's alpha values ranged from 0.856 to 0.924 and composite reliability from 0.859 to 0.929, all above 0.70. AVE values ranged from 0.636 to 0.769, exceeding the 0.50 criterion and supporting convergent validity. Discriminant validity was also supported because all HTMT ratios were below 0.90: 0.729 for facilities-work environment, 0.420 for facilities-performance and 0.756 for work environment-performance.

Table 2. Measurement-model assessment

Construct	Mean	Loading range	Cronbach's α	Composite reliability	AVE
Work facilities	4.04	0.780-0.867	0.876	0.878	0.670
Work environment	4.27	0.723-0.844	0.856	0.859	0.636
Midwives' performance	4.23	0.786-0.914	0.924	0.929	0.769

3.3 Structural Relationships and Mediation

Work facilities had a small, non-significant direct association with performance ($\beta = 0.058$; $p = 0.488$). Facilities were positively associated with the work environment ($\beta = 0.479$; $p < 0.001$), and the work environment was positively associated with performance ($\beta = 0.460$; $p = 0.006$). The specific indirect effect of work facilities on performance through the work environment was positive and significant ($\beta = 0.220$; $p = 0.014$). Because the indirect effect was significant while the direct effect was not, the pattern was interpreted as indirect-only mediation.

Table 3. Structural paths relevant to the mediation model

Path	β	p-value	Decision	Interpretation
Work facilities $\rightarrow$ performance	0.058	0.488	Not supported	No direct association
Work facilities $\rightarrow$ work environment	0.479	<0.001	Supported	Positive association
Work environment $\rightarrow$ performance	0.460	0.006	Supported	Positive association
Facilities $\rightarrow$ environment $\rightarrow$ performance	0.220	0.014	Supported	Significant indirect effect; indirect-only mediation

The complete dissertation model explained 44.1% of the variance in the work environment ($R^2 = 0.441$; $Q^2 = 0.271$) and 53.3% of the variance in midwives' performance ($R^2 = 0.533$; $Q^2 = 0.391$). Both Q^2 values were above zero, indicating predictive relevance for the endogenous constructs.

3.4 Discussion

The study produced a clear pattern: work facilities were not directly associated with midwives' performance, but they were associated with a better work environment, which in turn was associated with higher performance. The significant indirect path is the principal contribution of the study because it identifies how an organisational input may be converted into professional output.

Why Facilities Did Not Directly Predict Performance

The non-significant direct path should not be interpreted as evidence that facilities are unnecessary. Exclusive breastfeeding services depend on counselling, trust, continuity, follow-up and coordination across antenatal, delivery and postnatal care. A consultation room, educational aid or infant scale contributes only when it is functional, accessible and embedded in those routines. The high mean facility score may also have restricted variation, making facilities less able to distinguish high from low performers.

This interpretation is consistent with reviews showing that healthcare infrastructure influences staff through workflow, safety, communication and wellbeing rather than through a simple input-output relationship (7,8). It also explains why adding equipment without maintenance, supply continuity or clear procedures may fail to change daily practice.

Facilities as a Foundation for the Work Environment

The facilities-work environment coefficient was the largest direct path in the focused mechanism. Adequate rooms and equipment can reduce competition for resources, prevent interruptions, support privacy and clarify service flow. Reliable supplies allow staff to distribute responsibilities and coordinate activities instead of repeatedly solving logistical problems. Clean and safe spaces may also signal organisational concern for both workers and clients.

This result accords with midwifery research that treats resource adequacy as part of a positive practice environment. Aikins et al. (9) identified managerial support and resource adequacy as important determinants of midwives' work experiences, while Carvajal et al. (6) concluded that material and organisational conditions jointly shape safe and sustainable midwifery practice. Facility policy should therefore focus on functionality and use, not only procurement.

The Work Environment and Performance

The positive association between the work environment and performance indicates that structure, responsibility, managerial support, teamwork and communication matter for programme delivery. Clear roles reduce ambiguity; supportive supervision improves access to guidance and feedback; teamwork helps distribute workload; and communication supports consistent counselling, documentation and referral. These mechanisms correspond closely with the performance dimensions assessed in this study.

The finding is supported by evidence from Iranian midwives, where psychosocial working conditions were associated with job performance (11). National and international studies also show that organisational and psychosocial conditions influence job satisfaction, service quality and workforce stability among midwives (6,10). In Indonesia, work environment and social capital have likewise been linked to performance in exclusive breastfeeding programmes (14).

The Mediating Role of the Work Environment

The significant indirect effect shows that facilities gained performance value after they improved the conditions of work. This result refines the common assumption that infrastructure alone is a direct performance driver. From a Job Demands-Resources perspective, facilities reduce hindering demands, but their benefit emerges when they create a more predictable and supportive work system. Procurement without access, maintenance, role allocation, supervision and communication is therefore unlikely to produce sustained improvement.

The mediation finding also helps interpret the contrast between favourable staff ratings and the low exclusive breastfeeding coverage in Muna Regency. Self-reported performance is only one determinant of programme outcomes. Maternal employment, family beliefs, community support, follow-up systems and data quality may also influence coverage. Nevertheless, the identified organisational pathway is actionable and can be strengthened while broader maternal and community determinants are addressed.

Implications for Management and Policy

First, the Muna Regency Health Office and public health-centre managers should link facility investment to the complete breastfeeding-service pathway, from antenatal counselling to postnatal follow-up. Each resource should be assessed for availability, functionality, accessibility, utilisation and maintenance response time.

Second, facility improvement should be implemented together with clear task allocation, supportive supervision, routine team briefings, cross-programme coordination and feedback on breastfeeding indicators. Third, particular attention should be given to access to resources and logistical support, the lowest-rated facility dimension. Improving distribution, replenishment and technical support may yield more value than adding equipment that cannot be used consistently.

Strengths and Limitations

The study covered all 19 public health centres and used constructs with acceptable reliability, convergent validity and discriminant validity. Its focused mediation analysis also identifies a specific management mechanism rather than presenting a

broad list of predictors. Several limitations, however, should be considered when interpreting the findings. First, the cross-sectional design measures work facilities, work environment and performance at one point in time; consequently, temporal ordering cannot be demonstrated and the mediation analysis should be interpreted as statistical mediation rather than proof of a causal process. Second, all three focal constructs were measured using self-reported Likert-scale questionnaires completed by the same respondents, which may introduce common-method variance and social-desirability bias. Third, the study was conducted in a single regency, so the organisational, geographic and logistical characteristics of Muna may limit generalisability to other districts or health systems. Fourth, the study did not include objective facility audits, direct observations of midwives' performance or maternal and infant outcomes; therefore, favourable self-reported performance cannot be equated with programme coverage. Longitudinal, multisite and mixed-method studies should test whether improvements in facility functionality and the work environment precede changes in observed service quality, counselling performance, follow-up and exclusive breastfeeding coverage.

4. CONCLUSION

Work facilities were not directly associated with midwives' performance in the exclusive breastfeeding programme. Their effect operated through the work environment: better facilities were associated with clearer work systems, stronger support, cooperation and communication, and these conditions were associated with better performance. Health managers should therefore move beyond counting physical assets and ensure that facilities are functional, accessible and integrated into supportive work processes. An intervention package combining reliable logistics, supportive supervision, team coordination and performance feedback is more likely to improve programme delivery than facility procurement alone.

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AUTHOR CONTRIBUTIONS

W.R. conceptualised the study, collected and analysed the data and drafted the manuscript. U.R., N.Y. and S. supervised the research, contributed to interpretation and critically reviewed the manuscript. All authors approved the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICS STATEMENT

Participation was voluntary, written informed consent was obtained, and questionnaires were completed anonymously. Administrative research permission was obtained from the relevant institutions, and confidentiality was maintained throughout data collection and analysis.

DATA AVAILABILITY STATEMENT

De-identified data may be made available by the corresponding author subject to institutional permission and applicable ethical requirements.

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