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Factors Affecting Patient Safety in Independent Midwifery Practice

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Abstract. *This study aims to analyze the factors influencing the achievement of patient safety goals in independent midwifery practice, focusing on the roles of knowledge, attitude, practice, and motivation, as well as the mediating effect of motivation. Patient safety is a critical aspect of healthcare services, and midwives play a vital role in its implementation. Using a quantitative approach, this research involved 163 respondents consisting of independent midwives and pregnant women in Tangerang Regency. Data were analyzed using Structural Equation Modeling with Partial Least Squares (SEM-PLS). The results showed that knowledge did not have a significant direct effect on patient safety goals, while attitude and practice significantly influenced their achievement, with practice being the most dominant factor. Motivation also did not directly affect patient safety goals but was found to significantly mediate the relationship between knowledge and practice on patient safety goals, while it did not mediate the effect of attitude. Based on these findings, it is recommended that future research explores additional variables such as organizational support and workload, applies longitudinal and qualitative approaches, and expands the study area to provide a more comprehensive understanding of factors affecting patient safety in independent midwifery practice.*

Keywords: *Safety Goals, Midwives, KAP Model*

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INTRODUCTION

Ensuring patient safety is a fundamental component of healthcare quality because it directly relates to the prevention of avoidable harm, adverse events, and service failures during the provision of medical care. Patient safety is not only a technical issue within clinical procedures, but also an ethical and professional responsibility that requires healthcare providers to consistently identify risks, communicate effectively, prevent infection, administer medication safely, and ensure that every patient receives care according to established safety standards. The World Health Organization has emphasized Patient Safety Goals as a global framework for reducing medical errors and improving the quality of healthcare services. These goals include accurate patient identification, effective communication, infection prevention and control, safe medication management, and other preventive measures intended to minimize preventable harm. In Indonesia, the importance of patient safety has also been formally regulated through Minister of Health Regulation No. 11 of 2017. However, the implementation of patient safety remains uneven across healthcare settings, particularly in independent midwifery practice, where service delivery often depends heavily on the competence, commitment, and daily practices of individual midwives (Colvin et al., 2013; Goemaes et al., 2018; Zarbiv et al., 2025).

Midwives occupy a strategic position in maternal and child healthcare because they are often the first and most accessible healthcare providers for pregnant women, mothers, newborns, and families. Their role is especially important in community based and independent practice

settings, where maternal and neonatal care is delivered outside large institutional healthcare systems. In this context, midwives are expected not only to provide clinical services, but also to maintain safety standards, recognize potential risks, communicate clearly with patients and families, and prevent incidents that may endanger maternal and neonatal outcomes. The increasing number of midwives in Indonesia reflects an important expansion of healthcare access, including in Tangerang Regency, where Statistics Indonesia recorded 2,082 midwives in 2023. Nevertheless, the growth in service availability must be accompanied by stronger attention to quality and safety. When independent practices operate with limited facilities, uneven supervision, and varying levels of compliance with safety policies, the risk of patient safety problems may increase despite improved access to care (Althoweby et al., 2024; Vedam et al., 2022; Fuseini et al., 2023; Kumah, 2025; Mistri et al., 2023; Warner et al., 2022).

Patient safety problems in midwifery practice may appear in various forms, including medication errors, inadequate infection prevention, ineffective communication, incomplete documentation, weak referral procedures, and limited reporting of safety incidents. These problems are particularly concerning in independent midwifery practice because the setting is often characterized by high professional autonomy, limited external monitoring, and variable resource availability. Preliminary findings in Tangerang Regency indicate that patient safety challenges are still present, including safety incidents, manual reporting systems, limited sterilization facilities, and low compliance with allergy screening before medication administration. These conditions suggest that patient safety achievement cannot be understood merely as the availability of regulations or formal guidelines. It must also be examined through the actual knowledge, attitudes, practices, and motivation of midwives who are directly responsible for implementing safety procedures in daily care.

Previous studies have shown that knowledge, attitude, and practice are important determinants of healthcare behavior, including patient safety implementation. Knowledge enables healthcare providers to understand safety standards and recognize risks, while attitude reflects their professional commitment and perception of the importance of safe care. Practice represents the concrete application of safety procedures in clinical activities. However, the relationship among these factors is not always linear. A midwife may possess adequate knowledge but fail to implement patient safety procedures consistently when faced with limited resources, workload pressures, insufficient supervision, or weak institutional support. Similarly, positive attitudes may not automatically translate into safe practice unless supported by motivation and an enabling practice environment. Therefore, examining patient safety only through knowledge or attitude may provide an incomplete explanation of why safety goals are achieved or not achieved in independent midwifery practice.

This study applies the Knowledge, Attitude, and Practice model within the framework of the Theory of Planned Behavior to examine factors affecting the achievement of patient safety goals among independent midwives. The study also includes motivation as a mediating variable because motivation may explain how cognitive and behavioral factors are translated into patient safety outcomes. In independent midwifery practice, motivation is especially relevant because midwives often work with considerable autonomy and must maintain safety standards without continuous institutional supervision. By examining knowledge, attitude, practice, and motivation simultaneously, this study seeks to provide a more comprehensive understanding of patient safety implementation in independent midwifery practice.

The main contribution of this study lies in its focus on independent midwifery practice as a distinct healthcare setting. Much of the existing discussion on patient safety has been developed within hospital based systems, where standardized procedures, supervision, and reporting mechanisms are more formally established. Independent midwifery practice presents a different context because patient safety depends strongly on individual provider behavior, available facilities, and informal mechanisms of compliance. Therefore, this study is expected to provide empirical evidence that can support the development of more context appropriate strategies,

guidelines, and interventions to improve patient safety among independent midwives, particularly in Tangerang Regency.

LITERATURE REVIEW

Knowledge

Patient safety knowledge refers to healthcare providers' understanding of the principles, protocols, and strategies designed to prevent harm and improve patient outcomes. It includes not only theoretical understanding but also the ability to recognize risks and apply preventive measures effectively. In midwifery practice, such knowledge is essential for ensuring compliance with patient safety standards, reducing medical errors, and improving service quality (Yilmaz & Gülderen, 2025; Vedam et al., 2022; Brás et al., 2024; Jafari et al., 2024).

These dimensions are fundamental to effective patient safety implementation in independent midwifery practice. Therefore, strengthening midwives' knowledge through continuous training and competency-based education is essential to improving patient safety and enhancing the quality of midwifery services.

Attitude

Attitude toward patient safety refers to midwives' beliefs, perceptions, and commitment to ensuring safe healthcare delivery. It reflects their willingness to comply with safety protocols, recognize risks, and engage in behaviors aimed at minimizing patient harm. A positive attitude toward patient safety is essential for improving adherence to safety standards and fostering a culture of safety in healthcare (Falade et al., 2024; Fukami & Fukami, 2024).

Studies show that attitudes toward patient safety are influenced by individual and professional factors. Personal characteristics and work environment, such as age, experience, and practice setting, contribute to shaping midwives' attitudes. Structured educational interventions, including scenario-based learning, have also been found to significantly improve positive attitudes toward patient safety.

Training and professional experience further support the development of positive safety attitudes. Research indicates that structured clinical handovers, educational level, and work experience enhance midwives' commitment to maintaining maternal and patient safety (Rickard et al., 2022; Pilcher et al., 2022).

Conceptually, attitudes toward patient safety include awareness of medical risks, concern for safety incidents, and commitment to safety protocols. Risk awareness encourages proactive prevention of adverse events, while concern for safety is reflected in willingness to report incidents and accept feedback. Commitment is demonstrated through adherence to standard operating procedures and active participation in safety training, contributing to improved quality and safety of midwifery care (Kaur, 2025; Vedam et al., 2022; Rodríguez-García et al., 2023).

Practice

Practice in patient safety refers to midwives' adherence to safety protocols and preventive measures aimed at minimizing patient risk. This includes infection control, medication safety, accurate patient identification, and effective communication. Although knowledge and attitude provide the foundation, consistent practice is the most decisive factor in achieving patient safety (Mohammed et al., 2023; Pereira et al., 2024).

Studies indicate a persistent gap between knowledge and the implementation of patient safety practices. Only a proportion of midwives demonstrate excellent safety practices, while innovative educational approaches have been shown to improve long-term compliance. However, underreporting of medical errors remains common and may hinder patient safety improvement efforts (Alqahtani et al., 2026; Gong, 2022).

Effective implementation of patient safety practices must also consider clinical and cultural contexts. Contextual and locally adapted approaches are important for enhancing the

effectiveness of safety protocols (Pardoel et al., 2022). Conceptually, patient safety practice includes adherence to safety procedures, consistent incident reporting and follow-up, and the use of safety tools and technologies. These aspects play a critical role in improving the quality and safety of midwifery care.

Motivation

To understand the motivation variable, this study adopts the Self-Determination Theory (SDT). SDT conceptualizes motivation as a continuum ranging from amotivation to extrinsic motivation driven by external factors, and intrinsic motivation driven by personal satisfaction and enjoyment. Unlike conventional motivation theories that emphasize rewards and punishment, SDT focuses on the quality of motivation and assumes that individuals are naturally oriented toward growth and psychological well-being (Coco et al., 2023; Tessier etal., 2022; DeYoung & Tiberius, 2023).

Within SDT, motivation is categorized into autonomous and controlled motivation. Autonomous motivation includes intrinsic motivation and identified regulation, in which behavior is performed because it is personally meaningful (Bureau et al., 2022; Wang etal., 2022; Núñez-Regueiro, 2024). Controlled motivation includes external and introjected regulation, which are driven by external pressures or internal feelings such as guilt.

SDT also identifies three basic psychological needs as core dimensions of motivation: autonomy, competence, and relatedness. Autonomy refers to the sense of control over one's actions, competence reflects confidence in one's abilities, and relatedness refers to feeling socially accepted and supported.

Fulfillment of these needs is essential for sustaining intrinsic motivation. Individuals whose psychological needs are met tend to demonstrate greater engagement, persistence, and well-being, whereas unmet needs may reduce motivation and increase the risk of burnout. Therefore, SDT provides a comprehensive framework for understanding motivation and is relevant for designing strategies to enhance engagement and performance in healthcare settings (Karaferis et al., 2022; Hindman et al., 2026; Wu et al., 2022; Junça-Silva et al., 2022).

Patient Safety Goals

Patient safety goals in independent midwifery practice refer to the successful implementation of seven patient safety objectives: accurate patient identification, effective communication, medication safety, infection prevention and control, procedural safety, fall risk reduction, and patient safety incident reporting. These goals are fundamental to ensuring the quality and safety of maternal and neonatal healthcare. In autonomous midwifery practice, achieving these goals requires adequate knowledge, positive attitudes, and consistent adherence to safety protocols (Yeganeh et al., 2025).

Studies show that structured patient safety frameworks significantly improve midwifery practice. Implementation of patient safety models has been associated with improved knowledge, attitudes, and safety behaviors among midwives, while a strong patient safety culture contributes to reduced adverse maternal and neonatal outcomes.

Patient safety in midwifery is also closely linked to patient-centered care. Care that respects individual patient needs enhances safety, while safety netting emphasizes the importance of clear and structured communication in preventing safety incidents (Wannheden et al., 2024; Alhur et al., 2024; Glarcher & Vaismoradi, 2025).

Key patient safety goals include accurate patient identification and effective communication to reduce medical errors, including the use of standardized communication tools such as SBAR. Medication safety is supported through proper storage, labeling, and verification procedures. In addition, safe procedures, infection prevention, and fall risk reduction require adherence to safety standards and the use of procedural checklists (Al-Harthi et al., 2025; Sharma et al., 2024; Wolf et al., 2022). Patient and family involvement through open communication,

informed consent, and shared decision-making further strengthens the achievement of patient safety goals.

METHODS

This study employed a quantitative cross-sectional design using Partial Least Squares Structural Equation Modeling (SEM-PLS) to examine the relationships among knowledge, attitude, practice, motivation, and patient safety goals in independent midwifery practice.

Study Population and Respondent Structure

The study involved 163 respondents, consisting of: Independent midwives (primary unit of analysis). Pregnant women (supporting respondents for outcome validation). In this study, midwives were treated as the main analytical unit, as the variables of knowledge, attitude, practice, and motivation are conceptually and operationally inherent to healthcare providers.

Pregnant women were included only to assess perceived patient safety goal achievement, providing complementary perspectives on service outcomes. Their responses were aggregated at the practice level and used as a reflective measure of patient safety outcomes, not as independent units in the structural model. Thus, the SEM-PLS model was estimated using midwife-level data, while patient responses were used to strengthen external validity of the dependent construct.

Sampling Technique

A stratified random sampling approach was applied. The sampling frame consisted of registered independent midwives in Tangerang Regency obtained from local health office records. Inclusion criteria (midwives): Actively practicing independently, Minimum 1 year of experience, Willing to participate. Exclusion criteria: Not actively practicing during data collection, Incomplete questionnaire. Inclusion criteria (pregnant women): Received care from participating midwives, Minimum one visit experience, Provided informed consent

The proportion of respondents consisted

Respondents were recruited directly through midwifery practices with informed consent procedures.

Tabel 1. Theoretical Dimensions

Variable	Dimension
Knowledge (X1)	Understanding Patient Safety Procedures
	Incident Reporting
	Risk Prevention Awareness
Attitude (X2)	Awareness of Patient Safety Importance
	Concern for Patient Safety Incidents
	Commitment to Safety Protocols
Practice (X3)	Implementation of Patient Safety Procedures
	Reporting and Follow-Up of Medical Incidents
	Use of Patient Safety Tools and Technology
Patient Safety Goals (Y)	Accurate Patient Identification
	Effective Communication
	Safe Use of High-Alert Medications
	Safe Surgery and Correct Site Procedures
	Infection Control
	Fall Risk Reduction
	Patient and Family Engagement
Motivation (M)	Autonomy
	Competence
	Relatedness

As shown in Table 1, the patient safety goals variable initially consisted of seven dimensions. However, during SEM-PLS model validation, model simplification was performed to achieve better model fit and ensure statistical validity. Several dimensions or indicators were eliminated due to low loading factors, weak construct contributions, or model instability.

As reflected in the final model, each latent variable retained only the most significant and representative dimensions while maintaining logical consistency and theoretical relevance. The final structural model tested (Figure 1) consisted of Knowledge (X1), Attitude (X2), Practice (X3), Motivation (M) as the mediating variable, and Patient Safety Goals (Y) as the dependent variable. The model illustrates the direct effects of X1, X2, and X3 on Y, as well as indirect effects mediated by Motivation (M).

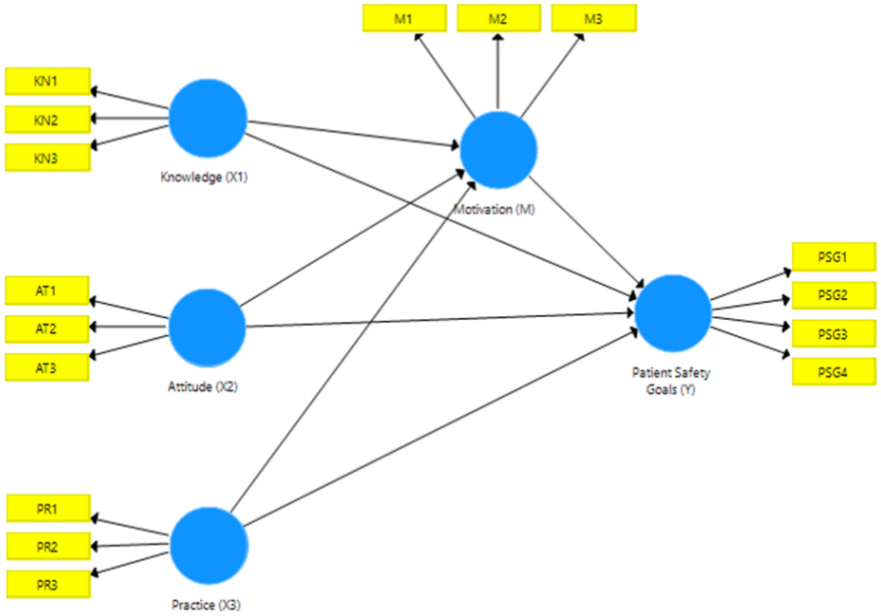

Figure 1. Model Final Structure

The collected data were analyzed using SmartPLS software. The analysis process included evaluation of the measurement model (outer model) to assess the validity and reliability of each indicator and construct. Subsequently, the structural model (inner model) was tested to examine the direct and indirect relationships among the studied variables.

Hypothesis testing was also conducted to determine the significance of each proposed relationship, including the mediating role of motivation in the relationships between knowledge, attitude, and practice and the achievement of patient safety goals. Through this methodological approach, the study is expected to generate empirical findings that provide a comprehensive explanation of the factors influencing successful patient safety implementation in independent midwifery practice.

RESULT AND DISCUSSION

Refinement of Measurement Model (Outer Model)

The outer model results indicate that all retained indicators achieved loading values above 0.70, confirming statistical validity. However, beyond statistical adequacy, these high loadings reflect an important substantive implication: the retained indicators represent highly homogeneous constructs within the context of independent midwifery practice.

Specifically, the Knowledge construct (0.942–0.955) demonstrates extremely high loadings, suggesting that respondents' understanding of patient safety is conceptually narrow but

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consistent, likely reflecting standardized training exposure rather than diverse cognitive interpretations. This homogeneity may explain why knowledge later shows limited explanatory power in the structural model.

Similarly, Practice indicators (0.855–0.881) show strong but slightly more varied loadings, indicating that implementation behaviors are more context-dependent and influenced by situational factors such as facility readiness and workload.

Elimination of Indicators and Construct Coverage

The initial conceptualization of Patient Safety Goals included seven dimensions, yet only four indicators (PSG1–PSG4) were retained in the final model. The removed dimensions primarily included: 1) Fall risk reduction; 2) Safe surgery/procedural verification; 3) Patient and family engagement

These indicators were excluded due to low loading factors (<0.70), suggesting weak empirical representation in the dataset.

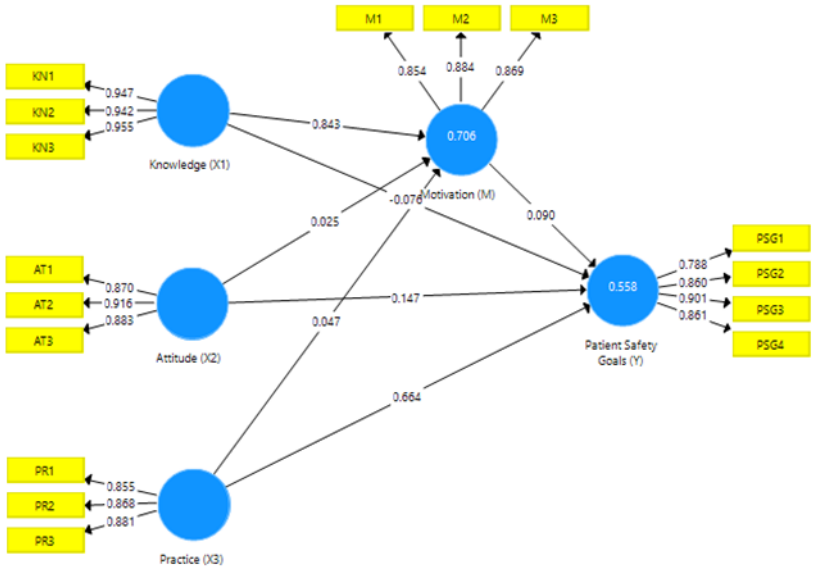

Figure 2. Outer Model (Running 1st)

As shown in Figure 2, all constructs demonstrated good measurement quality. The Knowledge construct (X1) was measured by three indicators (KN1–KN3) with loading values ranging from 0.942 to 0.955, indicating very high reliability in reflecting respondents' understanding of patient safety. The Attitude construct (X2) was also strongly measured by indicators AT1–AT3 with loadings of 0.870–0.916, indicating accurate representation of midwives' attitudes toward patient safety.

The Practice construct (X3) showed indicator loadings of 0.855–0.881 for PR1–PR3, demonstrating high validity in representing patient safety implementation. Motivation (M) was measured by indicators M1–M3 with loadings of 0.854–0.884, reflecting the dimensions of autonomy, competence, and relatedness based on Self-Determination Theory. Meanwhile, the Patient Safety Goals construct (Y) was represented by four indicators (PSG1–PSG4) with loadings of 0.788–0.901, indicating strong representation of patient safety goal achievement in independent midwifery practice.

Convergent validity testing (Table 2) showed that all indicators had outer loading values above 0.70. Therefore, all constructs were considered valid and suitable for further structural model analysis.

Table 2. Convergent Validity Test

Indicator	Attitude (X2)	Knowledge (X1)	Motivation (M)	Patient Safety Goals (Y)	Practice (X3)
AT1	0.870	–	–	–	–
AT2	0.916	–	–	–	–
AT3	0.883	–	–	–	–
KN1	–	0.947	–	–	–
KN2	–	0.942	–	–	–
KN3	–	0.955	–	–	–
M1	–	–	0.854	–	–
M2	–	–	0.884	–	–
M3	–	–	0.869	–	–
PR1	–	–	–	–	0.855
PR2	–	–	–	–	0.868
PR3	–	–	–	–	0.881
PSG1	–	–	–	0.788	–
PSG2	–	–	–	0.860	–
PSG3	–	–	–	0.901	–
PSG4	–	–	–	0.861	–

Based on Table 2, all indicators in this study were considered valid and capable of adequately representing their latent constructs. The high loading factor values indicate strong correlations between indicators and their respective constructs, thereby meeting the criteria for convergent validity. These findings confirm that the measurement model is reliable and appropriate for structural model analysis, ensuring the accuracy of the instrument in measuring the study variables.

In addition, the Average Variance Extracted (AVE) results in Table 3 show that all constructs had AVE values above 0.50, indicating good convergent validity. The highest AVE was found for Knowledge (X1) at 0.898, followed by Attitude (X2) at 0.792, Motivation (M) at 0.755, Practice (X3) at 0.754, and Patient Safety Goals (Y) at 0.729. These results confirm that the indicators of each construct adequately explain the variance of their respective constructs.

Table 3. Average Variance Extracted (AVE)

Variable	Average Variance Extracted (AVE)
Attitude (X2)	0.792
Knowledge (X1)	0.898
Motivation (M)	0.755
Patient Safety Goals (Y)	0.729
Practice (X3)	0.754

Based on Table 3, all constructs demonstrated good convergent validity, with Average Variance Extracted (AVE) values above 0.50. This indicates that the indicators explained more than 50% of the variance in their latent constructs, confirming that the measurement model was valid, reliable, and suitable for structural model testing.

Furthermore, discriminant validity testing in Table 4 showed that all variables met the criteria for discriminant validity, as indicated by the highest cross-loading values occurring within their respective constructs. Knowledge (X1), Attitude (X2), and Motivation (M) each demonstrated the highest loading on their own construct and lower loadings on other constructs, confirming clear construct differentiation and the appropriateness of the indicators in measuring the intended variables.

Table 4. Discriminant Validity

Variable	Attitude (X2)	Knowledge (X1)	Motivation (M)	Patient Safety Goals (Y)	Practice (X3)
Attitude (X2)	0.890				
Knowledge (X1)	0.006	0.948			
Motivation (M)	0.051	0.838	0.869		
Patient Safety Goals (Y)	0.440	-0.080	0.004	0.854	
Practice (X3)	0.435	-0.120	-0.043	0.734	0.868

The Patient Safety Goals construct (Y) demonstrated the highest cross-loading on its own construct at 0.854, with lower values on other constructs. A similar pattern was observed for the Practice variable (X3), which showed its highest cross-loading of 0.868 on its respective construct. These findings confirm that each construct is distinct and uniquely measured, indicating that the model meets the criteria for discriminant validity.

Composite reliability testing in Table 5 showed that all variables had Composite Reliability values above 0.70, indicating good reliability. Knowledge (X1) had the highest value at 0.964, followed by Attitude (X2) at 0.919, Patient Safety Goals (Y) at 0.915, and both Motivation (M) and Practice (X3) at 0.902. These results indicate that all constructs possess high internal consistency and are suitable for further analysis.

Table 5. Composite Reliability

Variable	Composite Reliability
Attitude (X2)	0.919
Knowledge (X1)	0.964
Motivation (M)	0.902
Patient Safety Goals (Y)	0.915
Practice (X3)	0.902

Based on the results presented in Table 5, all constructs in this study demonstrated good reliability and high internal consistency. Composite reliability values exceeding the minimum threshold of 0.70 indicate that the indicators consistently measured their respective variables. Therefore, the measurement model is considered robust and reliable, making it appropriate for the subsequent stage of structural model testing.

Inner Model

Following the evaluation of the outer model, the next stage of analysis involved testing the inner model (structural model). Structural model analysis was conducted to examine the relationships among latent variables as proposed in the research hypotheses. This stage focused on testing the direct and indirect effects of knowledge (X1), attitude (X2), and practice (X3) on patient safety goals (Y), with motivation (M) serving as a mediating variable in independent midwifery practice.

Structural model testing is essential to determine the extent to which each independent variable influences the dependent variable and to assess the overall predictive strength of the proposed research model.

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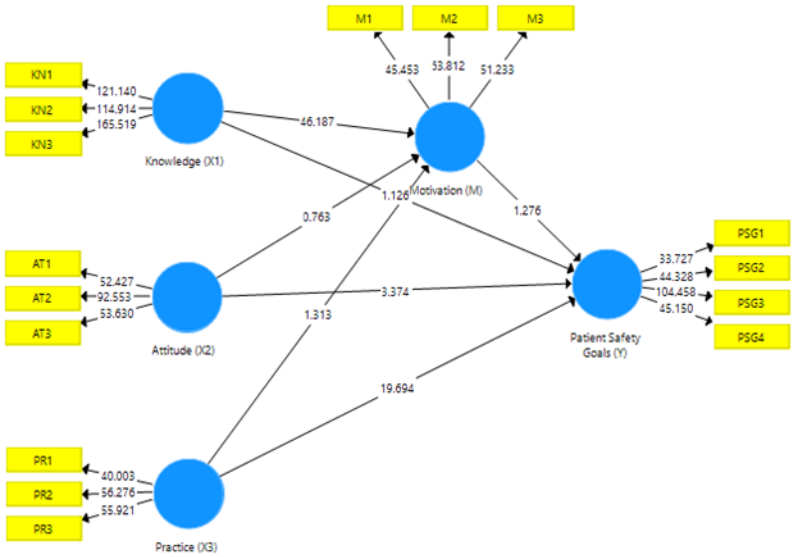

Figure 3. Inned Model

As shown in Figure 3, the structural model presents the path coefficients and T-statistics used to assess the significance of relationships among variables. This analysis identifies direct and indirect effects, including the mediating role of motivation, on the achievement of patient safety goals and provides an overview of the inner model testing results and their implications for improving patient safety practices in independent midwifery care.

The R-square results in Table 6 indicate that Motivation (M) had an adjusted R-square value of 0.703 (strong category), meaning that 70.3% of the variance in motivation was explained by knowledge, attitude, and practice. Meanwhile, Patient Safety Goals (Y) had an adjusted R-square value of 0.553 (moderate category), indicating that knowledge, attitude, practice, and motivation collectively explained 55.3% of the variance in patient safety goal achievement. These findings confirm that the structural model has good predictive capability in explaining motivation and patient safety outcomes.

Table 6. R-Square

Variable	R Square Adjusted
Motivation (M)	0.703
Patient Safety Goals (Y)	0.553

Hypothesis testing in this study was conducted by evaluating the p-values of each direct-effect path in the structural model, as presented in Table 7. A significance threshold of $p < 0.05$ was used to determine statistical significance.

The results showed that Attitude (X2) had a significant direct effect on Patient Safety Goals (Y), with a p-value of 0.001 and a T-statistic of 3.374. This indicates that midwives' attitudes directly contribute to the achievement of patient safety goals in independent midwifery practice.

Practice (X3) demonstrated a very strong and significant direct effect on Patient Safety Goals (Y), with a p-value of 0.000 and a T-statistic of 19.694. This finding indicates that practice is the most dominant factor influencing patient safety outcomes compared with the other independent variables in the model.

Table 7. Dirrect Results

Direct Effect	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Attitude (X2) -> Motivation (M)	0.025	0.023	0.033	0.763	0.446

Attitude (X2) -> Patient Safety Goals (Y)	0.147	0.148	0.044	3.374	0.001
Knowledge (X1) -> Motivation (M)	0.843	0.844	0.018	46.187	0.000
Knowledge (X1) -> Patient Safety Goals (Y)	-0.076	-0.071	0.068	1.126	0.261
Motivation (M) -> Patient Safety Goals (Y)	0.090	0.085	0.070	1.276	0.203
Practice (X3) -> Motivation (M)	0.047	0.045	0.036	1.313	0.190
Practice (X3) -> Patient Safety Goals (Y)	0.664	0.666	0.034	19.694	0.000

In contrast, several direct relationships in the structural model were not statistically significant ($p > 0.05$). The path from Attitude (X2) to Motivation (M) was not significant ($p = 0.446$), nor was the direct effect of Knowledge (X1) on Patient Safety Goals (Y) ($p = 0.261$). Although Knowledge (X1) significantly influenced Motivation (M) ($p = 0.000$), the effect of Motivation (M) on Patient Safety Goals (Y) was not significant ($p = 0.203$). In addition, the direct effect of Practice (X3) on Motivation (M) was not significant ($p = 0.190$). These findings indicate that patient safety goal achievement is primarily influenced by Attitude and Practice, while Motivation does not have a significant direct effect.

Indirect effect analysis was conducted to test the mediating role of Motivation (M) in the relationships between Attitude, Knowledge, and Practice and Patient Safety Goals (Y). The results showed that the indirect effect of Knowledge (X1) on Patient Safety Goals (Y) through Motivation (M) was significant ($p = 0.005$; $T = 1.268$), indicating that Motivation acts as a partial mediator. This suggests that increased midwives' knowledge may strengthen motivation, which subsequently contributes to the achievement of patient safety goals in independent midwifery practice.

Table 8. Indirect Results

Indirect Effect	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Attitude (X2) -> Motivation (M) -> Patient Safety Goals (Y)	0.002	0.002	0.004	0.621	0.535
Knowledge (X1) -> Motivation (M) -> Patient Safety Goals (Y)	0.075	0.072	0.060	1.268	0.005
Practice (X3) -> Motivation (M) -> Patient Safety Goals (Y)	0.004	0.004	0.005	0.788	0.031

However, the other two indirect effects were not statistically significant. The mediating effect of Motivation (M) on the relationship between Attitude (X2) and Patient Safety Goals (Y) was not significant ($p = 0.535$), indicating that motivation does not mediate this relationship. Similarly, the indirect effect of Practice (X3) on Patient Safety Goals (Y) through Motivation (M), although closer to the significance threshold, remained marginal with a p-value of 0.031.

These findings suggest that motivation does not play a strong mediating role in the proposed model. Instead, direct effects—particularly from knowledge and especially practice—contribute more substantially to the achievement of patient safety goals in independent midwifery practice.

Total effects analysis was used to assess the overall influence of each independent variable on the dependent variable and to estimate effect size within the model. Based on effect size criteria, where 0.35 is considered strong, 0.15 moderate, and 0.02 weak, Practice (X3) showed the largest total effect on Patient Safety Goals (Y), with a value of 0.669. This strong effect confirms

that the level of safety practices implemented by midwives is the most dominant factor in achieving patient safety goals in independent midwifery practice.

Table 9. Total Effect Testing

Relationship	Path Coefficient (β)
Attitude (X2) → Motivation (M)	0.025
Attitude (X2) → Patient Safety Goals (Y)	0.149
Knowledge (X1) → Motivation (M)	0.843
Knowledge (X1) → Patient Safety Goals (Y)	-0.001
Motivation (M) → Patient Safety Goals (Y)	0.090
Practice (X3) → Motivation (M)	0.047
Practice (X3) → Patient Safety Goals (Y)	0.669

Meanwhile, Attitude (X2) had a total effect of 0.149 on Patient Safety Goals (Y), which falls within the moderate effect size category. This indicates that attitude contributes to improving patient safety, although its influence is not as strong as that of practice. In contrast, Knowledge (X1) showed a minimal total effect on Patient Safety Goals (Y), with a value of −0.001. This finding suggests that knowledge does not have a significant direct impact on the achievement of patient safety goals in the proposed model. Motivation (M) also demonstrated a relatively small total effect of 0.090, indicating a limited mediating role.

Overall, these results confirm that Practice is the most influential factor in achieving patient safety goals in independent midwifery practice, followed by Attitude with a moderate effect. In contrast, Knowledge and Motivation exhibit relatively weak effects on patient safety goal achievement.

Revisiting the Role of Knowledge: Beyond Linear KAP Assumptions

The finding that knowledge does not significantly influence patient safety goals challenges the conventional linear assumption of the Knowledge–Attitude–Practice (KAP) model. Traditionally, KAP assumes that increased knowledge will lead to improved attitudes and ultimately better practices. However, the results of this study suggest that such a linear progression does not hold in the context of independent midwifery practice. This discrepancy indicates that knowledge alone is insufficient to drive behavioral change when structural and contextual constraints are present. In independent practice settings, midwives often operate with limited supervision, varying levels of infrastructure, and inconsistent access to updated training. As a result, knowledge may remain cognitively internalized but behaviorally inactive.

This finding contributes to the broader debate by suggesting that the KAP model should not be treated as universally applicable. Instead, it should be contextualized, particularly in decentralized healthcare systems where environmental and institutional factors play a stronger role than individual cognition. Thus, this study supports a shift from a knowledge-driven model to a context-sensitive behavioral model.

Attitude as a Normative Driver of Safety Behavior

The significant effect of attitude on patient safety goals highlights its role as a normative and value-based driver of behavior. Unlike knowledge, which reflects cognitive understanding, attitude captures professional commitment and internalized beliefs about the importance of safety. In the context of independent midwifery practice, where external monitoring is minimal, attitude becomes a critical internal control mechanism. Midwives with strong safety-oriented attitudes are more likely to adhere to protocols even in the absence of strict enforcement.

However, the relatively moderate effect size suggests that attitude alone is not sufficient. This implies that while attitudes can motivate intention, their translation into consistent behavior still depends on enabling conditions such as resources, time availability, and workload management.

Practice as the Dominant Determinant: Evidence of Behavior-Centered Safety

The strong and dominant effect of practice on patient safety goals confirms that patient safety is fundamentally behavior-driven. This finding reinforces the idea that actual implementation of safety protocols rather than knowledge or intention is the most critical determinant of outcomes. This dominance of practice can be explained by the nature of independent midwifery care, where: 1) Clinical decisions are often made autonomously; 2) Standardization is less strictly enforced; 3) Safety relies heavily on routine actions and habits

Thus, patient safety in this context is shaped more by what midwives do consistently rather than what they know or believe. This finding aligns with behavioral theories that emphasize habit formation and environmental reinforcement over cognitive determinants. It also suggests that interventions aimed at improving patient safety should prioritize practice-based training, supervision, and system support, rather than focusing solely on knowledge enhancement.

Reinterpreting Motivation Through Self-Determination Theory (SDT)

Although this study adopts Self-Determination Theory (SDT), the empirical findings reveal that motivation does not have a significant direct effect on patient safety goals. This result requires deeper theoretical reflection. According to SDT, motivation is shaped by three core psychological needs: Autonomy (sense of control), Competence (confidence in ability), Relatedness (social connection and support). The non-significant effect of motivation suggests that these psychological needs may not be adequately fulfilled in independent midwifery practice. Autonomy may exist structurally (midwives work independently), but not psychologically, as decisions are constrained by limited resources, Competence may be undermined by lack of continuous training or feedback systems, Relatedness is likely weak due to professional isolation and limited peer interaction.

As a result, motivation in this context may be controlled rather than autonomous, meaning it is driven by obligation rather than intrinsic engagement. This type of motivation is less effective in producing sustained behavioral outcomes, which explains its weak impact on patient safety. Thus, the findings extend SDT by demonstrating that: The mere presence of motivation is insufficient the quality and context of motivation determine its effectiveness.

Rethinking the Mediating Role of Motivation

The initial model suggested that motivation mediates the relationship between knowledge and patient safety goals. However, given that motivation does not significantly influence patient safety directly, this mediating role becomes theoretically questionable. A more accurate interpretation is that: Knowledge significantly influences motivation. But motivation does not translate into safety behavior. This indicates a break in the motivational pathway, where increased knowledge may enhance perceived competence but fails to produce actionable outcomes due to contextual barriers.

Therefore, motivation in this study should be understood as a latent or constrained mediator, rather than an effective transmission mechanism between knowledge and practice.

Contextualizing the Findings: Independent Midwifery Practice as a Unique System

A major contribution of this study lies in its contextual setting. Independent midwifery practice differs significantly from hospital-based systems in several ways: Limited regulatory enforcement, Resource variability (equipment, facilities), High autonomy with low supervision, Informal safety monitoring systems. These characteristics create an environment where: Knowledge is not always operationalized, Motivation is not structurally supported, Practice becomes the primary determinant of outcomes.

This explains why the model deviates from classical theoretical expectations. The findings suggest that patient safety in such settings is less about individual capability and more about system readiness and environmental support.

Theoretical and Practical Implications

Theoretically, this study contributes by: Challenging the linearity of the KAP model, Extending SDT by emphasizing contextual constraints on motivation, Highlighting the dominance of behavioral over cognitive determinants. Practically, the findings imply that improving patient safety in independent midwifery practice requires: Strengthening practice-based interventions (checklists, SOP enforcement), Enhancing system support (supervision, infrastructure), Building collaborative networks to improve relatedness and professional support.

CONCLUSION

The findings indicate that knowledge does not have a direct effect on the achievement of patient safety goals in independent midwifery practice, whereas attitude and practice have significant effects, with practice emerging as the most dominant factor. Motivation does not directly influence patient safety goals but serves as a significant mediator in the relationships between knowledge and practice and patient safety goals. In contrast, motivation does not mediate the relationship between attitude and patient safety goals, as attitude exerts a direct effect. Future research is recommended to incorporate additional variables such as organizational support, workload, and leadership, and to apply longitudinal designs and qualitative approaches to obtain a more comprehensive understanding and improve the generalizability of findings.

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