

RESEARCH ARTICLE

Psychosocial Determinants of Antenatal Care Utilisation in Palopo City, Indonesia: An Integrated Health Belief Model and Intention-Based Approach

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ABSTRACT

Introduction: Antenatal care (ANC) is an essential maternal health service for preventing pregnancy complications. However, ANC utilisation remains suboptimal in many developing countries, including Indonesia. This study examined psychosocial determinants associated with ANC utilisation using an integrated Health Belief Model and an intention-based behavioural framework among pregnant women in Palopo City, Indonesia.

Methods: A cross-sectional study was conducted among 109 pregnant women in the second and third trimesters at Pontap Health Center, Palopo City, Indonesia. Data were collected using a structured questionnaire and analysed using partial least squares structural equation modelling (PLS-SEM) to examine direct and indirect associations among psychosocial constructs, intention, and ANC behaviour.

Results: Knowledge was inversely associated with intention ($\beta = -0.410$; $p = 0.030$), while risk perception ($\beta = 0.333$; $p < 0.001$), subjective norms ($\beta = 0.187$; $p = 0.001$), and self-efficacy ($\beta = 0.893$; $p < 0.001$) were positively associated with intention. Intention was positively associated with ANC behaviour ($\beta = 0.598$; $p < 0.001$). In contrast, knowledge and self-efficacy did not have significant direct associations with ANC behaviour. The reported indirect effects suggest a potential mediating role for intention. These findings highlight psychosocial and intention-based pathways associated with ANC behaviour among pregnant women in Indonesia.

Conclusion: This study highlights the association between psychosocial factors, particularly behavioural intention, and ANC behaviour among pregnant women. Health-promotion strategies that address risk perception, subjective norms, and self-efficacy may support ANC attendance. Longitudinal and intervention studies are needed to examine these relationships over time.

Keywords: Antenatal Care; Health Belief Model; Behavioural Intention; Pregnant Women; Psychosocial Factors

INTRODUCTION

Antenatal care (ANC) is a fundamental component of maternal and child healthcare because it facilitates the early identification of pregnancy-related complications and timely intervention during pregnancy (1,2). The World Health Organization (WHO) recommends at least eight ANC contacts to improve maternal and neonatal health outcomes (3,4). Adequate ANC attendance has been associated with neonatal outcomes in Rwanda (5,6).

Despite global progress, ANC coverage remains suboptimal (7,8). Country-specific evidence also shows persistent challenges in achieving adequate ANC attendance; for example, changes in adequate ANC visits have been examined in Tanzania (9). This shortfall is particularly evident in low- and middle-income countries, where access to and continuity of maternal healthcare remain major challenges (10,11). In Indonesia, national statistics indicate that 96% of pregnant women attend at least one ANC visit, but only 74% complete the recommended minimum of four visits (12). Gaps also remain in the quality, timeliness, and continuity of ANC services, suggesting that behavioural factors may contribute beyond service accessibility alone (8,13).

Most studies of ANC utilisation have focused on demographic characteristics and healthcare-delivery factors. Comparatively fewer studies have examined how cognitive and psychological processes shape pregnant women's intentions to seek ANC, particularly in settings where health resources and service accessibility are limited. The Health Belief Model (HBM) provides a useful framework for understanding these mechanisms by explaining how individual beliefs relate to preventive health practices. Previous research has often emphasised individual factors, such as knowledge and access to services, but has less frequently integrated risk perception, perceived benefits, self-efficacy, and intention within a comprehensive model (14–16).

The HBM conceptualises preventive health behaviour as being associated with perceived health threats, expected benefits, perceived barriers, and self-efficacy. However, evidence on how these psychosocial factors relate to ANC utilisation in developing countries remains limited and fragmented. Previous studies have mainly focused on demographic and socioeconomic determinants, whereas intention-based pathways linking psychosocial constructs to ANC behaviour remain underexplored in the Indonesian maternal-health context. To address this gap, the present study integrates core HBM constructs with subjective norms and behavioural intention to develop a broader psychosocial framework for explaining ANC behaviour among pregnant women. The inclusion of subjective norms was informed by intention-oriented behavioural theories, particularly the Theory of Planned Behaviour, which emphasises the role of social influence in shaping health-related intentions and behaviours.

Applying the HBM to ANC may provide a deeper understanding of how cognitive and perceptual factors relate to maternal health behaviour. Studies from Ethiopia and India have reported context-specific psychosocial and service-related correlates of ANC-related practices (17,18). These findings suggest that the contribution of individual constructs may vary across sociocultural contexts. In Indonesia, although ANC coverage is relatively high, adherence to recommended contact schedules remains suboptimal, and behavioural theory-based research that integrates psychosocial factors is limited. A clearer understanding of these factors may inform interventions tailored to the local context. This study aimed to examine a psychosocial model of ANC utilisation among pregnant women in Indonesia by integrating HBM constructs with subjective norms and behavioural intention.

METHODS

Study Design

This cross-sectional study examined associations between behavioural constructs derived from the HBM and ANC utilisation among pregnant women. Data were collected at a single time point; therefore, the analysis could estimate associations but not establish temporal or causal relationships.

The study was conducted at Pontap Health Center, Palopo City, Indonesia, from July to September 2025. The target population comprised pregnant women registered at the health centre during the study period. Participants were recruited according to predefined inclusion and exclusion criteria and completed the study questionnaire.

Participants and Sample

The study targeted pregnant women receiving maternal health services in Palopo City, Indonesia. Women attending antenatal care (ANC) visits at Pontap Health Center between July and September 2025 were screened for participation. A minimum sample size of 126 participants was estimated a priori using an observation-to-parameter heuristic of five to ten observations per estimated parameter. During recruitment, 126 women were screened; 121 provided written informed consent and five declined to participate. Following data collection, nine questionnaires were excluded because they were incomplete, and three participant records were excluded after eligibility verification. Consequently, data from 109 participants were included in the final PLS-SEM analysis. The final sample was below the initial target of 126 participants.

PLS-SEM was used to estimate the structural associations among the proposed behavioural constructs and to assess their predictive relationships with ANC utilisation. This approach was selected because it can accommodate complex structural models and relatively modest sample sizes.

The inclusion criteria were (1) pregnancy in the second or third trimester, (2) registration for maternal health services, and (3) voluntary agreement to participate. The exclusion criteria were (1) severe pregnancy complications requiring hospital treatment and (2) an incomplete questionnaire.

Setting

The study was conducted at Pontap Health Center in Palopo City, South Sulawesi, Indonesia. Palopo is an urban area with a diverse population in which *Puskesmas* provide most primary maternal health services. Pontap Health Center offers routine ANC and maternal health counselling. The setting was therefore considered relevant for examining behavioural factors associated with adherence to recommended ANC contacts.

Variables and Measurement Instruments

Data were collected using a structured questionnaire operationalising six constructs within the study framework (19). The questionnaire comprised six constructs: Knowledge (3 items; score range 3–15), Risk perception (2 items; score range 2–10), Subjective norms (2 items; score range 2–10), Self-efficacy (5 items; score range 5–25), Intention (4 items; score range 4–20), and ANC examination behaviour (2 items; score range 2–10). All items were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating more favourable responses for each construct. ANC examination behaviour was assessed using participants' self-reported adherence to the recommended schedule and timing of ANC visits. The questionnaire was modified to suit the study context prior to data collection.

Each construct was measured using items rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The questionnaire was adapted from previously validated instruments and adjusted to the Indonesian context through forward and backward translation. Maternal-health specialists and public-health researchers reviewed the translated instrument for content validity, conceptual equivalence, and cultural appropriateness. The instrument was pilot-tested with 30 pregnant women to assess item clarity, readability, and comprehensibility before the main data collection. All constructs demonstrated acceptable internal consistency (Cronbach's alpha, 0.70–0.88) and average variance extracted (AVE) values >0.50.

Data Collection and Quality Control

Quantitative data were collected using a structured questionnaire over three months, from July to September 2025. Before participation, respondents received an information sheet describing the study objectives, procedures, and confidentiality safeguards and provided written informed consent. Data collection took place in the ANC unit at Pontap Health Center in Palopo City.

Research assistants and midwives at the health centre assisted with identifying eligible respondents and administering the questionnaire. Respondents completed the questionnaire independently in a private area, with an average completion time of 20–30 minutes. Anonymity and confidentiality were emphasised to reduce common-method bias. Completed questionnaires were checked for missing responses, and clarification was sought immediately when an incomplete response was identified.

Statistical Analysis

Data were analysed using SmartPLS version 4. The hypothesised relationships among latent variables were estimated using partial least squares structural equation modelling (PLS-SEM). This method was selected because the analysis focused on prediction and indirect associations within a multidimensional conceptual model.

Model evaluation followed a two-step procedure. First, the measurement model was assessed using indicator loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), and discriminant validity. After acceptable measurement properties were established, the structural model was evaluated using standardised path coefficients, coefficients of determination (R^2), and bootstrapping with 5,000 resamples to assess the significance of the hypothesised associations. Descriptive statistics were used to summarise participant characteristics and study variables.

Ethical Considerations

The study received approval from the Health Research Ethics Committee, Mega Buana University, Palopo (approval number: 003/UMBP/KEPK/VI/2025). All participants received an explanation of the study objectives, procedures, risks, and benefits and provided written informed consent before participation. Participation was voluntary, and participants could withdraw at any time without consequences. Confidentiality and anonymity were maintained throughout the study.

RESULTS

Table 1. Participant Characteristics (n = 109)

Indicator	Category	n	%
Age	Adolescents (<20 years)	5	4.6
	Reproductive age (20–35 years)	80	73.4
	Advanced maternal age (>35 years)	24	22.0
Education	Primary education (elementary and junior high school)	44	40.4
	Secondary education (high school)	43	39.4
	Higher education (Diploma III, Bachelor's degree, Master's degree)	22	20.2

Indicator	Category	n	%
Employment	Employed	48	44.0
	Not employed	61	56.0
Number of children	0–2 children	56	51.4
	3–4 children	41	37.6
	>4 children	12	11.0
Gravidity	Primigravida (1 pregnancy)	29	26.6
	Multigravida (2–4 pregnancies)	68	62.4
	Grand multigravida (≥ 5 pregnancies)	12	11.0
Trimester	Second trimester	64	58.7
	Third trimester	45	41.3

Most participants were aged 20–35 years (73.4%), followed by those aged >35 years (22.0%) and <20 years (4.6%). Primary, secondary, and higher education were reported by 40.4%, 39.4%, and 20.2% of participants, respectively. More than half were not employed (56.0%). Most participants were multigravida (62.4%), and 58.7% were in the second trimester.

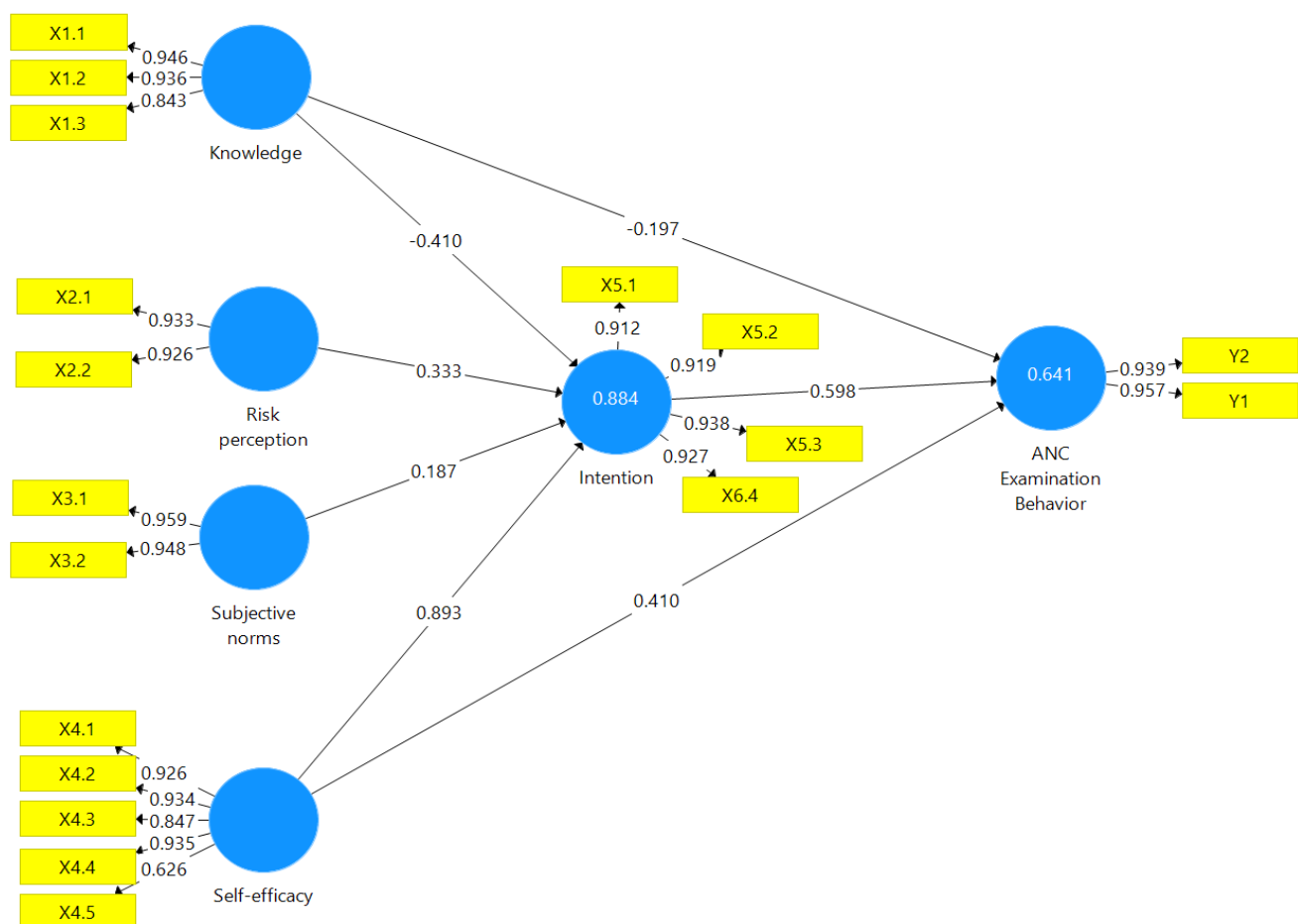


Figure 1. Measurement and Structural Model of ANC Utilisation Behaviour

X1 = Knowledge; X2 = Risk perception; X3 = Subjective norms; X4 = Self-efficacy; X5 = Intention; and Y = ANC examination behaviour. Indicator labels (X1.1–X1.3, X2.1–X2.2, X3.1–X3.2, X4.1–X4.5, X5.1–X5.4, and Y1–Y2) represent the observed variables for each latent construct. Values on the arrows indicate standardised path coefficients (β), while values within the endogenous constructs indicate the coefficient of determination (R^2). Statistical significance was assessed using the SmartPLS bootstrapping procedure with 5,000 bootstrap resamples.

The measurement model showed satisfactory psychometric performance across the latent variables. Most standardised indicator loadings were >0.70 , indicating that the indicators contributed meaningfully to their respective constructs. Knowledge, risk perception, subjective norms, and intention had consistently high loadings (0.843–0.959).

Indicator loadings for self-efficacy ranged from 0.626 to 0.935. Although one indicator was below the commonly recommended threshold of 0.70, it was retained because the loading remained within an acceptable range and the construct met the recommended criteria for composite reliability and convergent validity.

The ANC behaviour construct had high indicator loadings (0.939 and 0.957), indicating that both indicators represented the construct consistently. Overall, the measurement model met the criteria for convergent validity and construct reliability and was therefore used for structural-model evaluation.

The psychosocial constructs accounted for 88.4% of the variance in intention ($R^2 = 0.884$). Intention and self-efficacy accounted for 64.1% of the variance in ANC behaviour ($R^2 = 0.641$). Under commonly used PLS-SEM criteria, these values indicate substantial explanatory power for intention and moderate-to-substantial explanatory power for ANC behaviour (Figure 1).

Table 2. Convergent Validity and Construct Reliability

Variable	AVE	CR	Cronbach's alpha
Knowledge	0.85	0.94	0.91
Risk perception	0.86	0.95	0.92
Subjective norms	0.91	0.96	0.94
Self-efficacy	0.72	0.91	0.88
Intention	0.85	0.95	0.93
ANC behaviour	0.90	0.95	0.91

AVE = average variance extracted (>0.50); CR = composite reliability (>0.70).

Table 2 summarises construct validity and reliability. All latent variables had AVE values above 0.50, indicating adequate convergent validity. Composite reliability and Cronbach's alpha values exceeded 0.70 for all constructs, supporting internal consistency. The measurement model therefore met the reported psychometric criteria for structural-model evaluation. Discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT). The supplied HTMT matrix included values above the recommended cut-off of 0.85, indicating that discriminant validity was not fully established for all construct pairs. The HTMT results should therefore be interpreted using the complete matrix rather than as uniformly meeting the 0.85 criterion.

Table 3. Structural-Model Evaluation and Hypothesis Testing

Association	β	t-value	VIF	p-value
Knowledge (X1) → Intention (X5)	-0.410	2.065	1.842	0.030*
Knowledge (X1) → ANC behaviour (Y)	-0.197	0.448	4.472	0.327
Risk perception (X2) → Intention (X5)	0.333	4.003	2.115	<0.001*
Subjective norms (X3) → Intention (X5)	0.187	3.068	2.487	0.001*
Self-efficacy (X4) → Intention (X5)	0.893	3.635	3.021	<0.001*
Self-efficacy (X4) → ANC behaviour (Y)	0.410	0.963	3.246	0.166
Intention (X5) → ANC behaviour (Y)	0.598	3.876	1.000	<0.001*

β = standardised path coefficient; VIF = variance inflation factor. t-values and p-values were obtained using bootstrapping; *p < 0.05 (reported as one-tailed).

Table 3 shows that knowledge (X1), risk perception (X2), subjective norms (X3), and self-efficacy (X4) were significantly associated with intention to attend ANC. Knowledge had a significant inverse association with intention ($\beta = -0.410$; $p = 0.030$), whereas risk perception ($\beta = 0.333$; $p < 0.001$), subjective norms ($\beta = 0.187$; $p = 0.001$), and self-efficacy ($\beta = 0.893$; $p < 0.001$) had significant positive associations. Self-efficacy had the largest positive path coefficient for intention.

Knowledge and self-efficacy did not have statistically significant direct associations with ANC behaviour. Intention was positively associated with ANC behaviour ($\beta = 0.598$; $p < 0.001$). The indirect effects were evaluated separately; their mediation interpretation depends on reconciliation of the final SmartPLS specific-indirect-effects output reported in Table 4. All reported variance inflation factor (VIF) values were <5.0, suggesting that multicollinearity was not a major concern in the structural model.

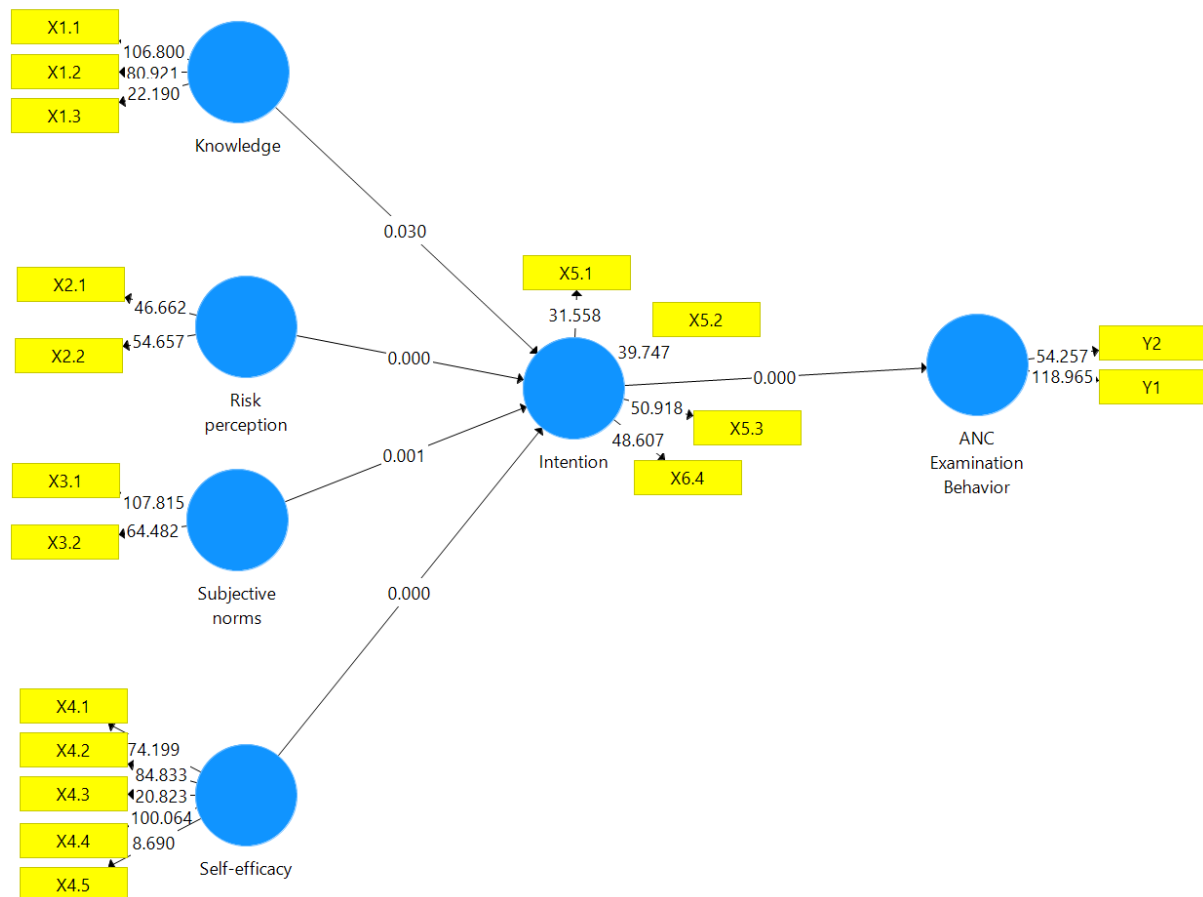


Figure 2. Final Structural Model of Psychosocial Determinants and Behavioural Intention Associated with ANC Utilisation Behaviour

X1 = Knowledge; X2 = Risk perception; X3 = Subjective norms; X4 = Self-efficacy; X5 = Intention; and Y = ANC examination behaviour. Indicator labels (X1.1–X1.3, X2.1–X2.2, X3.1–X3.2, X4.1–X4.5, X5.1–X5.4, and Y1–Y2) represent the observed variables for each latent construct. Values on the structural paths indicate the statistical significance (p-values) obtained from the SmartPLS bootstrapping procedure, while values adjacent to the indicators represent the bootstrapped t-statistics for the measurement model.

Figure 2 presents the reported associations among the HBM-related constructs, subjective norms, intention, and ANC behaviour. Knowledge, risk perception, subjective norms, and self-efficacy were associated with intention, and intention was associated with ANC behaviour. Self-efficacy had the largest positive path coefficient for intention, whereas its direct association with ANC behaviour was not statistically significant. The mediation interpretation should be finalised only after the indirect-effect statistics in Table 4 are reconciled with the final SmartPLS output.

Table 4. Indirect Associations and Mediation Analysis

Indirect path	β	t-value	p-value	95% bias-corrected CI	Interpretation
Knowledge → Intention → ANC behaviour	-0.245	1.587	0.056	-0.642 to -0.040	No significant indirect association
Risk perception → Intention → ANC behaviour	0.256	3.945	<0.001	0.156 to 0.367	Significant indirect association
Self-efficacy → Intention → ANC behaviour	0.534	4.348	<0.001	0.469 to 1.045	Significant indirect association
Subjective norms → Intention → ANC behaviour	0.147	2.863	0.002	0.069 to 0.237	Significant indirect association

β = standardised indirect-association coefficient. Confidence intervals were generated using bias-corrected bootstrapping at the 95% confidence level; $p < 0.05$ was reported as the one-tailed significance criterion.

Table 4 reports indirect associations between psychosocial factors and ANC behaviour through intention. The reported results for risk perception, self-efficacy, and subjective norms are shown as statistically significant. The knowledge indirect association requires verification because the p-value, confidence interval, and interpretation currently reported in Table 4 are

not mutually consistent. All indirect-effect estimates should be replaced with values re-exported from the final SmartPLS model before the statistical interpretation is finalised.

Self-efficacy had the strongest reported association with intention, suggesting that maternal confidence may be important in ANC-related decision-making. The association between subjective norms and intention also suggests that social influence from family members and healthcare providers may contribute to pregnant women's intention to attend ANC.

DISCUSSION

Association Between Knowledge (X1) and Intention (X5)

The study found a statistically significant inverse association between knowledge and intention, indicating that higher knowledge was associated with lower intention to utilise antenatal care. Although previous studies have generally reported a positive relationship between knowledge and health-related intentions (20,21), the present finding suggests that knowledge alone may not be sufficient to strengthen the intention to utilise antenatal care. Other psychosocial factors, such as self-efficacy, subjective norms, and risk perception, may play a more prominent role in shaping pregnant women's intentions.

Knowledge did not have a statistically significant direct association with ANC behaviour. This finding suggests that knowledge alone may be insufficient to explain variation in ANC behaviour. Previous health-behaviour studies have similarly indicated that knowledge is one cognitive component among several motivational and psychosocial factors associated with behaviour (20,21).

In the Indonesian maternal-health context, knowledge of pregnancy risks and ANC schedules may help women recognise the importance of routine care. However, knowledge may not translate into consistent ANC attendance when access, family support, or economic constraints are present.

These findings indicate that maternal-health interventions should not rely solely on information provision. Programmes may also need to address motivation, risk perception, social support, and self-confidence to strengthen pregnant women's intention to attend ANC consistently.

Association Between Risk Perception (X2) and Intention (X5)

Risk perception was positively associated with pregnant women's intention to attend ANC. Greater awareness of possible pregnancy complications or adverse consequences of inadequate ANC was associated with stronger intention to attend. This finding is consistent with the HBM, in which perceived susceptibility and perceived severity are important cognitive components of health-related intention (19,22).

Previous studies have also reported associations between pregnancy-related risk perceptions and early or regular ANC attendance (23,24). Awareness of health risks may therefore be related to motivation for preventive care, including routine pregnancy examinations (25). Maternal-health communication that explains pregnancy-related risks and the value of early complication detection may support ANC attendance.

The finding is consistent with the HBM proposition that risk perception contributes to the formation of behavioural intention. Maternal-health education should therefore explain both the benefits of ANC and the possible consequences of inadequate attendance, while avoiding fear-based or overstated messaging.

Association Between Subjective Norms (X3) and Intention (X5)

Subjective norms were positively associated with pregnant women's intention to attend ANC. Perceived encouragement and expectations from partners, family members, and healthcare workers may therefore be relevant to motivation for ANC attendance.

This finding is consistent with the Theory of Planned Behaviour, which identifies subjective norms as a determinant of behavioural intention (26). Family support and the social environment have also been associated with maternal health practices (27). Subjective norms may therefore represent an external social influence related to internal motivation.

The finding may reflect the importance of family and community involvement in pregnancy-related healthcare decisions in the study setting. Incorporating subjective norms into the HBM-based framework adds a social dimension to the analysis of behavioural intention.

Maternal-health promotion programmes may benefit from involving partners, families, community health workers, and healthcare providers. Family- and community-based approaches may strengthen social support for regular ANC attendance.

Association Between Self-Efficacy (X4) and Intention (X5)

Self-efficacy had the largest positive association with pregnant women's intention to attend ANC. Greater confidence in accessing services, overcoming barriers, and scheduling routine visits was associated with stronger intention. This finding is consistent with research identifying self-efficacy as an important psychological correlate of health-related intention and behaviour (28).

Previous studies have linked self-efficacy with health-related intentions and maternal-health practices (15). Interventions that include counselling, mentoring, and skills-based education may strengthen maternal confidence (29). Greater confidence may help women perceive transportation, financial, time, and pregnancy-related barriers as more manageable.

The finding reinforces the role of self-efficacy within the HBM framework. Maternal-health promotion programmes may therefore incorporate emotional support, empowerment strategies, and practical assistance with service access. Such strategies may strengthen intention and support more consistent ANC attendance.

Association Between Intention (X5) and ANC Behaviour (Y)

Behavioural intention may be an important psychosocial pathway linking knowledge, risk perception, subjective norms, and self-efficacy with ANC behaviour. Although knowledge and self-efficacy did not have significant direct associations with ANC behaviour, the indirect-effect analysis suggests pathways through intention; however, the knowledge indirect effect requires verification against the final SmartPLS specific-indirect-effects output. This pattern is consistent with behavioural-health research that identifies intention as a proximal correlate of behaviour (30).

This study examined psychosocial and intention-based pathways associated with ANC behaviour in an Indonesian maternal-health setting. The findings highlight the associations of self-efficacy and social influence with behavioural intention. Previous studies have often examined direct associations between knowledge, risk perception, self-efficacy, and ANC behaviour, with inconsistent findings (14,15). The present analysis suggests that these factors may also be related to ANC behaviour through intention.

The findings highlight the central role of intention in translating cognitive perceptions and social influences into ANC attendance. Improving maternal health behaviour may therefore require more than increasing knowledge alone. Programmes may combine health education with motivational counselling, family engagement, social support, and strategies to strengthen self-efficacy.

The study contributes evidence on psychosocial correlates of ANC utilisation in an Indonesian setting. However, the cross-sectional design precludes causal inference, and recruitment from a single health centre may limit the generalisability of the findings to other geographic and healthcare settings.

Limitations

This study has several limitations. First, the cross-sectional design precludes conclusions about the temporal or causal relationships among HBM constructs, intention, and ANC behaviour. Longitudinal or experimental studies are needed to examine the proposed pathways over time. Second, the study was conducted in a specific geographic and cultural setting, which may limit the generalisability of the findings.

The model did not include several contextual factors that may be associated with ANC behaviour, including access to health facilities, service quality, and socioeconomic constraints. The findings should therefore be interpreted as associations within a combined psychological and contextual system. Future studies should incorporate environmental and structural variables to provide a more comprehensive account of maternal healthcare-seeking behaviour.

Recommendations for Future Research

Future research should use longitudinal or experimental designs to examine temporal and causal relationships among HBM constructs, intention, and ANC behaviour. Models should also incorporate contextual variables, including healthcare accessibility, service quality, and socioeconomic constraints. Cross-cultural comparative studies may help assess whether intention has a similar mediating role across sociocultural settings. Qualitative research could complement quantitative findings by exploring pregnant women's perceptions, barriers, and motivations regarding ANC attendance. Digital-health interventions and family-centred approaches may also be evaluated as strategies to strengthen intention and adherence.

CONCLUSION

This study examined psychosocial and intention-based associations with ANC behaviour among pregnant women in Palopo City, Indonesia. Knowledge, risk perception, subjective norms, and self-efficacy were associated with behavioural intention, and intention was associated with ANC behaviour. Self-efficacy had the largest positive path coefficient for intention, highlighting the potential importance of maternal confidence in ANC attendance.

The study contributes evidence on psychosocial and intention-based pathways in the Indonesian maternal-health context. The findings suggest that cognitive and social factors may be associated with ANC behaviour through intention. Maternal-health promotion strategies may therefore address self-efficacy, social support, and risk awareness alongside knowledge.

The findings should be interpreted in light of the cross-sectional design and the specific sociocultural setting. The temporal ordering of the observed associations could not be established, and the results may not represent maternal healthcare behaviour in other populations. Longitudinal and mixed-methods studies should examine changes in maternal health behaviour over time and incorporate structural determinants such as healthcare accessibility, service quality, and socioeconomic disparities.

DECLARATIONS

Author contributions: D.T. contributed to the study design, data collection, and initial drafting of the manuscript. E.U. was responsible for data analysis, interpretation of findings, and critical revision of the manuscript. F.F. (corresponding author) conceptualized the research framework, supervised the overall study process, and finalized the manuscript for submission. A.S.A. contributed to literature review, methodological refinement, and provided critical feedback to improve the manuscript. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Conflicts of interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. This statement confirms that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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