



Future Adaptations of Psychosocial Program for Indonesian Pregnant Adolescents: A Research Synthesis

Ermiati Ermiati ¹, Restuning Widiasih ¹, Farah Huwaida Qurrota Aini², Nita Ayu Srimurni²

¹Department of Maternity Nursing, Faculty of Nursing, Universitas Padjadjaran, Sumedang, West Java, Indonesia; ²Faculty of Nursing, Universitas Padjadjaran, Sumedang, West Java, Indonesia

Correspondence: Ermiati Ermiati, Department of Maternity, Faculty of Nursing, Universitas Padjadjaran, Jl. Raya Bandung-Sumedang KM 21, Hegarmanah, Jatinangor, Sumedang, West Java, 45363, Indonesia, Tel +628122109363, Fax +6222-7795596, Email ermiati@unpad.ac.id

Abstract: Adolescent pregnancy is a persistent global challenge, often accompanied by elevated risks of depression, anxiety, and social isolation. Despite growing international attention, evidence-based psychosocial interventions targeting pregnant adolescents remain limited, particularly in low- and middle-income countries such as Indonesia. This systematic review aimed to synthesize evidence on psychosocial and mental-health interventions for pregnant adolescents aged 10–19 years and considers implications for Indonesian policy and practice. This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. Searches of PubMed and Scopus covered 2015–2025. Eight eligible studies were identified. Results indicate that psychosocial interventions, such as mHealth programs, task-sharing models, and human-centered designs, effectively improve adolescent maternal mental health, reducing distress and enhancing bonding. Studies highlight the need for scalable interventions embedded in primary care, especially in resource-limited settings like Indonesia. This review underscores the importance of culturally relevant, integrated care models. It is crucial to engage families and use hybrid delivery models for sustained engagement. Programs combining digital tools with in-person care showed high acceptability but modest behavioral changes. Future research should focus on long-term effectiveness and impact of collaborative care models to enhance outcomes for adolescent mothers.

Keywords: adolescent pregnancy, Indonesia, mental health, psychosocial programs, psychosocial intervention

Introduction

Adolescent pregnancy remains a significant global public health concern, particularly in low- and middle-income countries (LMICs). Adolescence is transitional developmental stage characterized by identity formation, evolving autonomy, and educational engagement.^{1,2} International estimates indicate that each year approximately 21 million adolescent girls aged 15–19 become pregnant in developing regions, resulting in around 12 million live births, plus at least 0.8 to 2 million births occur among girls younger than 15.^{3–5} Global projections further suggest that about 13% of adolescent girls will become mothers before turning 18, underscoring the disproportionate burden borne by resource-constrained settings.⁶ In LMICs including Indonesia, adolescent pregnancy is driven less by individual “choices” and more by poverty, low education, early marriage, restrictive gender norms, and poor access to accurate sexuality education and youth-friendly contraception.^{7–12} Pregnancy during this period may intensify psychological distress and reduce access to supportive networks. Untreated perinatal mental health problems can adversely affect maternal wellbeing, mother-infant bonding, and child development outcomes. Therefore, adolescent pregnancies greatly affect both physical and psychosocial well-being, which may be the burden is getting heavier in LMICs.

Evidences indicate that adolescent pregnancy is associated with significant physical and psychological consequences. Physically, adolescents are at higher risk of anemia, hypertensive disorders, preterm birth, and delivering low birth weight infants, particularly when access to adequate antenatal care is limited.^{13–15} Psychologically, pregnant adolescents

experience higher rates of depression, anxiety, stigma, and social isolation compared with adult mothers.^{16–18} When early pregnancy is caused by structural disadvantage, these overlapping health risks make inequality worse and make both the mother and the child more vulnerable in the long term.

Adolescent pregnancy is still prevalent in both urban and rural areas in Indonesia.¹⁹ To address this issue, Indonesia established service standards and programs to address the physical and psychological problems that arise from early marriage. The Adolescent Care Health Service Program is aimed to address early marriage, unwanted pregnancy, and HIV to improve adolescents' knowledge and use of health services and guide program design across Indonesia.²⁰ Other programs exist, such as the early marriage and stunting community programs for nutrition counseling and school-based early-marriage risk education for junior and senior high students, but these programs are not integrated. To manage psychological problems, the Indonesian Ministry of Health suggests a strategic approach of implementing screening at three touchpoints: the first trimester of antenatal care, the fifth antenatal care visit in late pregnancy, and 8–28 days after delivery.²¹ However, in practice, many districts employ short-term instruments like the Edinburgh Postnatal Depression Scale (EPDS). Through these approaches, programs to help the adolescent pregnancy demography as well as prevent future adolescent pregnancies are implemented in Indonesia.

Several reviews have explored psychosocial programs for adolescent parents and perinatal mental health. A review from a study of psychosocial interventions for pregnant adolescents in high-income countries described programs such as home visits, counseling, group programs, school-linked services, and parenting/skills training produced small-moderate improvements in positive mental health and moderate improvements in school attendance.²² However, most present global findings in aggregates and do not examine how programs fit within specific national systems. As a result, while international evidence identifies promising strategies, clearer guidance is still needed on how these can be realistically adapted to the policies and service contexts of LMICs, including Indonesia. It is expected that international evidence offers several programs models relevant to LMIC contexts. This study aims to synthesize evidence on psychosocial and mental-health programs for pregnant adolescents and young mothers, considers implications for Indonesian policy and practice.

Materials and Methods

Study Design

This study employed a research synthesis using a scoping review approach. A scoping review was selected to allow a broad and flexible exploration of the available literature, accommodating diverse study designs, methodologies, and types of evidence relevant to the research question.²³ This approach is particularly appropriate when the objective is to identify key concepts, gaps in research, and types of evidence across a broad topic area. Consistent with this rationale, the present design acknowledges that psychosocial wellbeing cannot be understood solely through statistical measures, but also requires interpretative consideration of lived experiences, program feasibility, and cultural relevance across diverse contexts.

Search Strategy

This scoping review was guided by the Population–Concept–Context (PCC) framework to ensure alignment with the study objective of synthesizing evidence on psychosocial and mental-health programs for pregnant adolescents and deriving implications for Indonesian policy and practice. The Population (P) comprised pregnant adolescents (10–19 years). Studies including broader age ranges (eg, up to 24 years) were considered if pregnant adolescents formed part of the target population or if interventions were explicitly designed for adolescent and young mothers in transitional age groups; the Concept (C) referred to psychosocial and mental-health programs, including preventive, promotive, and supportive interventions; and the Context (C) encompassed community, primary care, school-based, and digital settings across diverse countries and health systems. Based on this framework, the research question was formulated as: What psychosocial and mental-health programs have been implemented for pregnant adolescents, and what components and delivery approaches may inform future adaptations in the Indonesian context?

We conducted a comprehensive search in PubMed and Scopus to identify relevant peer-reviewed studies, using combined keywords and Boolean operators to capture variations in focus and terminology; the main search string was:

(“adolescent pregnancy” OR “pregnant adolescents” OR “teen mothers” OR “young mothers”) AND (“psychosocial intervention” OR “mental health program” OR “psychological support” OR “mHealth” OR “peer support” OR “community-based program”) AND (“maternal wellbeing” OR “perinatal depression” OR “anxiety” OR “mental health”)

Truncation and phrase searching were applied to increase sensitivity (eg, “interven-*” to retrieve intervention, interventions, and intervention-based). Searches were limited to articles published in English between 2015 and 2025. Additionally, reference lists of included articles were manually screened to identify further relevant studies.

Eligibility Criteria

Eligibility criteria were determined a priori based on the PCC framework. Studies were included if they: (1) involved pregnant adolescents or adolescent mothers as the primary population; (2) evaluated or described psychosocial or mental-health programs aimed at improving maternal wellbeing, preventing or managing perinatal depression or anxiety, or enhancing psychosocial functioning; and (3) were conducted in any country or care setting, including community-based, clinical, school-based, or digital environments. Empirical studies employing quantitative, qualitative, or mixed-methods designs were eligible to ensure comprehensive mapping of program models and implementation approaches. Studies including participants up to 24 years of age were included when pregnant adolescents were represented within the sample or when interventions were commonly delivered to adolescent and young mothers as a combined programmatic group. Findings were interpreted with attention to developmental differences across age ranges.

Studies were excluded if they: (1) focused exclusively on adult pregnant women without separate analysis of adolescents; (2) examined solely pharmacological or biomedical interventions without a psychosocial component; (3) did not report program-related outcomes or descriptions; or (4) were editorials, commentaries, conference abstracts, dissertations, or review articles. This approach ensured that the synthesis captured diverse intervention models while maintaining relevance to future program adaptation within the Indonesian context.

Study Selection Process

All records were exported to Mendeley Reference Manager for organization and de-duplication. Screening was conducted in two sequential phases: title-abstract screening followed by full-text review. Two authors independently assessed each record for eligibility at both stages. Discrepancies were resolved through discussion, and when consensus was not immediately achieved, the remaining authors were consulted to reach a final decision. In line with the collaborative nature of the review, all four authors contributed to the final confirmation of included studies. The study selection process was documented using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 flow diagram, detailing the numbers of records identified, screened, excluded, and included, thereby providing a transparent audit trail of the process.

Data Extraction

A standardized data extraction sheet was developed to systematically record information from each included study. Extracted data included author and year of publication, country of study, study design, target age group, intervention type, delivery mode, and key findings. The “intervention type” variable captured the overarching classification of the program (eg, home-visiting intervention, psychosocial group-based program, mHealth intervention, clinical mental health treatment), while “delivery mode” referred to the mechanism through which the intervention was implemented (eg, face-to-face sessions, home visits, SMS messaging, group classes, primary care integration). The “key findings” column summarized the primary and secondary outcomes relevant to antenatal care attendance and psychosocial determinants. This structured extraction framework enabled consistent comparison across heterogeneous intervention models and facilitated thematic synthesis of intervention characteristics and outcomes.

Data Synthesis and Analysis

Data were synthesized using a narrative approach due to the variation in study designs, intervention types, and outcome measures. The included programs were compared descriptively to identify their main strengths and weaknesses, particularly in relation to effectiveness, feasibility, and psychosocial impact. The findings were then interpreted in light of the Indonesian context, considering health system structure, sociocultural factors, and resource availability. Based on this comparison, potential contextual adaptations and possible implementation challenges were identified to inform future program development for pregnant adolescents in Indonesia.

Results

In this study, total of 465 records was initially identified from two databases, namely Scopus ($n = 249$) and PubMed ($n = 216$). After the removal of records prior to screening, 88 records flagged as ineligible by automation tools (Tier 2015–2025), 9 excluded for other predefined reasons (Tier Q1–Q4), and 2 without available abstracts, 150 records remained for title and abstract screening. No duplicate records were identified. Of these, 139 records were excluded for not meeting the inclusion criteria. The full texts of 11 articles were then sought for further assessment; however, 3 could not be retrieved. Eight articles underwent full-text eligibility assessment, and 2 were subsequently excluded because they were review articles. In total, 6 studies fulfilled all inclusion criteria and were included in the final review. The selection process is illustrated in [Figure 1](#).

This scoping review included six empirical studies that examined diverse psychosocial and mental health programs targeting pregnant adolescents and young women. Overall, the interventions addressed perinatal depression, psychological distress, social support, parenting preparation, and antenatal care engagement through a range of delivery approaches. The study designs comprised a descriptive program non-empirical ($n = 1$); intervention protocols, including a mixed-methods protocol integrating qualitative exploration, Nominal Group Technique, and a planned RCT, as well as a cluster randomized controlled trial protocol ($n = 2$); a qualitative human-centered design study for intervention development ($n = 1$); a sequential mixed-methods study combining medical file audit, pre–post surveys, and brief interviews ($n = 1$); and a pilot two-arm randomized controlled trial with a pre–post design ($n = 1$). [Table 1](#) summarizes the key characteristics and main findings of the included studies.

Description of Included Studies

The studies included a variety of developing countries such as Iran,²⁴ Nigeria,²⁵ Mozambique,²⁶ and South Africa,²⁷ and developed countries such as United States²⁸ and Australia.²⁹ Due to the heterogeneity in program approaches, follow-up durations, and outcome measures, the studies included are categorized based on their program. The categories are comprised of types of approach, intensity levels of intervention, and their psychosocial focus.

Type of Approach

Based on the data synthesis, five primary types of approach emerged: home-based, group-based, digital-based, and Primary Health Center (PHC)-integrated. A study discussing home-based approach centered their programs on the Nurse–Family Partnership (NFP) model, beginning during pregnancy and continuing until the child is 2 years old.²⁸ This approach is primarily one-to-one between a visiting nurse and the mother, and ultimately reduces the burden on vulnerable pregnant adolescents who face poverty, trauma, unstable support, and barriers to health service engagement. Besides the home-based approach with mainly individual components, group-based approaches were discussed in three studies.^{24,26,29} The group approach is implemented through class sessions, both for educational and counseling purposes^{24,26} as well as for physical exercise sessions.²⁹ Although group-based interventions may help with normalizing experiences and reduce isolation through shared participations, there may also be discomfort in discussing sensitive issues in mixed or adult-dominated settings, as well as disadvantages in participation due to practical barriers such as scheduling and transport.

A study by Gureje et al implemented another approach by integrating their intervention package with primary maternal care clinics.²⁵ This primary health center (PHC)-integrated approach is delivered along with maternal services that are already part of routine service delivery. Through this approach, the study was able to combine psychological

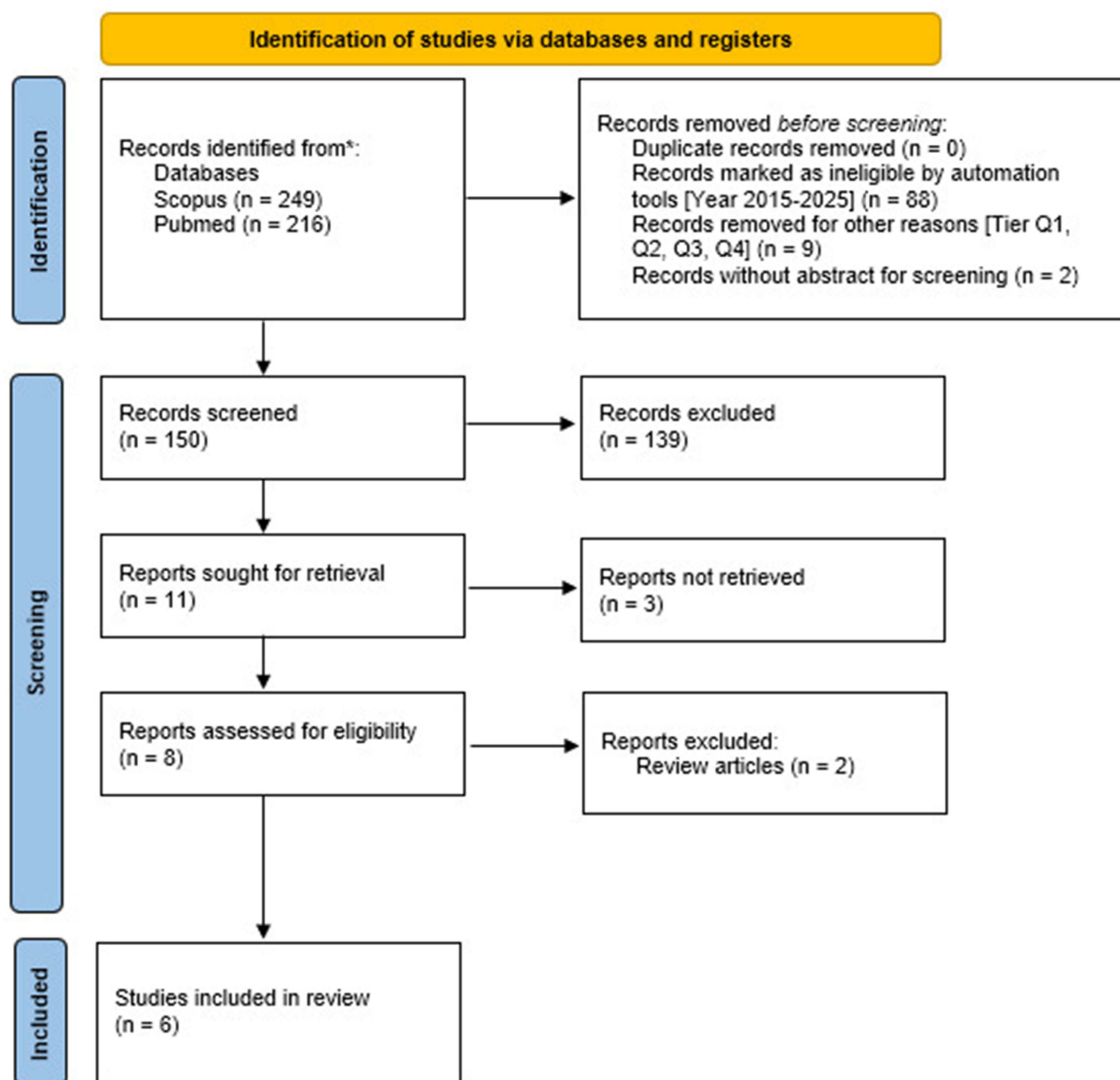


Figure 1 PRISMA 2020 flow diagram illustrating the identification, screening, and inclusion process of studies in the scoping review.

treatment, parenting support, and community support in one package, as well as ensuring real-world scalability. However, it relies greatly on provider training, fidelity, workload, and the quality of implementation within PHC systems. Lastly, the digital-based approach in the study by Sewpaul et al differs from the others. Rather than relying on repeated face-to-face contact, it delivers support, information, and encourages healthy behavior remotely and asynchronously through two-way mobile messaging.²⁷ However, this approach does not guarantee high engagement from participants, and digital support may not be enough when barriers are structural, emotional, or interpersonal.

Intensity Levels

The intensity levels of the interventions vary from high to low, based on how much time and effort are needed. Two studies are considered to have a high intensity level of interventions, with weekly to fortnightly sessions that start during pregnancy until six weeks up to six months postpartum if needed.^{25,28} Moderate intensity of intervention was found in two studies, with one article suggesting flexibility with psychosocial contact distributed across multiple formats rather

Table 1 Summary of Articles

Author (Year)	Country	Study Design	Target Age	Intervention Type	Delivery Mode	Key Findings
Yousefi et al, (2025) ²⁴	Iran	Mixed-methods protocol (Qualitative exploration → Nominal Group Technique → RCT)	Pregnant adolescents aged 13–19 years	Culturally tailored psychosocial support intervention (life skills, stress management, emotion regulation, peer support)	Group-based sessions (6–8 weekly sessions, 90 minutes each) delivered by trained midwives; integrated into childbirth preparation classes	Protocol study; aims to improve depression, anxiety, stress, and perceived social support. Intervention developed via qualitative phase + expert consensus (Nominal Group Technique)
Gureje et al, (2020) ²⁵	Nigeria	Cluster Randomized Controlled Trial (protocol)	Pregnant adolescents <20 years with EPDS ≥12	Structured psychosocial package: Behavioral Activation (BA) + Problem-Solving Treatment (PST) + Parenting Skills Training + “Neighborhood Mother” support	Delivered by trained primary maternal healthcare providers (PHC workers) in primary maternal clinics; antenatal sessions + postnatal follow-up + tele-support	Hypothesis: Intervention will significantly reduce depressive symptoms (≥2-point EPDS difference) and improve parenting skills at 6 months postpartum compared to usual care
Salisbury et al, (2021) ²⁶	Mozambique	Qualitative human-centred design study (intervention development study)	Young women aged 16–24 years (pregnant or postpartum ≤1 year)	“Mama Felíz” (Happy Mama): Strengths-based psychosocial and motherhood preparation programme	Combination of group sessions (clinic-based), one-to-one sessions (home or clinic), and family sessions; delivered by trained community mothers	Intervention co-designed with young women, families, providers, and Ministry of Health; addresses five priority challenges: uncertainty, financial instability, self-care knowledge gaps, parenting skills, and social support
Sewpaul et al, (2023) ²⁷	South Africa	Pilot 2-arm RCT with a pre-post design	Pregnant adolescent girls and young women (13–20 years)	Teen MomConnect with standard national MomConnect one-way SMS to improve antenatal care (ANC) attendance and psychosocial determinants (knowledge, attitudes, self-efficacy)	Mobile phone SMS text messaging (one-way + two-way tailored messages); optional face-to-face MI (motivational interviewing) session	No significant difference in ANC attendance vs control; higher knowledge gains among high-engagement participants. This study also shows mHealth tailoring without sufficient engagement does not meaningfully shift psychosocial determinants.

(Continued)

Table 1 (Continued).

Author (Year)	Country	Study Design	Target Age	Intervention Type	Delivery Mode	Key Findings
Payne & Anastas (2016) ²⁸	United States	Descriptive program study (non-empirical)	Pregnant teens (10–19 years), primarily low-income urban adolescents	Nurse–Family Partnership (NFP) home-visiting program enhanced with social work collaboration (trauma-informed, mental health–integrated model)	Home visiting from pregnancy (≤28 weeks gestation) until child age 2 years; weekly to biweekly visits; integrated nurse + social worker collaboration	NFP improves prenatal health behaviors and child outcomes; however, trauma exposure and PTSD may reduce intervention effectiveness. Social work integration proposed to address mental health, ACEs, and IPV, improving retention and therapeutic alliance
Styles et al, (2019) ²⁹	Australia	Sequential mixed-methods study (medical file audit, pre–post session surveys, brief interviews)	Young pregnant women aged 14–24 years (mean age 20), many with documented psychological distress (60%)	<i>Yogabond</i> Prenatal Yoga: To improve management of psychological distress, enhance maternal–foetal bonding, and increase social connectedness	Voluntary, twice-weekly, 1-hour sessions throughout pregnancy (from ≥13 weeks gestation). With core component: 1) 45-minute prenatal yoga (postures, breathing, relaxation); 2) Mindfulness techniques; 3) Foetal attachment focus; 4) Labour preparation breathing exercises; 5) 15-minute facilitated group discussion	Perceived reductions in distress, improved relaxation, labour preparedness, enhanced bonding with baby, and increased peer social connection

than a single repeated modality,²⁶ and the other included eight sessions spanning for gestational weeks 20 to 37.²⁴ The remaining two articles implemented a lower level of intensity, with interventions completed twice a week for one hour for at least eight sessions²⁹ and only receiving text messages with a subset of in-person motivational interviewing sessions.²⁷

Psychosocial Focus

Across the six studies included, five of psychosocial focus were discussed, including knowledge and psychoeducation; coping and self-regulation; mental health symptom reduction; stigma and social marginalization; and bonding and attachment. Knowledge-building is the most universal component across the interventions, with five studies discussing knowledge and psychoeducational focus through different antenatal topics.^{24–28} Mental health symptom reduction was also another major focus in the studies included, such as reducing adolescent perinatal depression,²⁵ anxiety and stress;²⁴ psychological distress;²⁹ as well as trauma and PTSD.²⁸ Addressing stigma and social marginalization was discussed in four studies, with the majority discussing the negative attitudes and social exclusion associated with adolescent pregnancy.^{24–26,28} Finally, bonding and attachment was discussed in three studies, which discussed the importance of strengthening mother-child connection through mindfulness exercises and counseling.^{25,28,29}

Discussion

This review synthesized evidence from six diverse psychosocial and mental health interventions targeting pregnant adolescents and young women across varied global contexts. Despite differences in study design, delivery mode, and intervention intensity, the findings collectively highlight the importance of structured psychosocial support in shaping antenatal engagement and mental well-being. At the same time, variations in effectiveness, feasibility, and implementation demands suggest that not all models are equally transferable across settings. The following sections discuss the effectiveness of these intervention approaches and consider their relevance and potential adaptation within the Indonesian context.

Characteristics and Approaches of Psychosocial Programs

Pregnant adolescents face high risks of depression, anxiety, stigma, and poor obstetric outcomes.²² A variety of positive psychosocial outcomes was identified, reflecting the diverse range of studies contributing to the data synthesis. This variation may be attributable to differences in types of approach or the content of the interventions implemented; it may also be explained by differences in the types of positive psychosocial outcomes measured across the six studies that reported this outcome.

Our findings have shown that various types of effective psychosocial programs, such as continuous home-based relational care, classroom-style antenatal sessions, or digital-based support through text messages, can improve the psychosocial and mental health needs of pregnant adolescents.^{24–29} Home-based approach entails an intervention program built around nurse home visiting, with a sustained relationship between the mother and the nurse.²⁸ This approach reaches mothers in their own environments, making it especially suitable for adolescents with complex psychosocial needs. This is relevant with a previous study that found personalized home visiting programs for adolescent mothers can enhance parenting skills, maternal well-being, and certain child health outcomes.³⁰ In comparison, we found that group-based approach was less likely to be personalized. However, it was also highlighted that interventions carried out in group sessions can normalize experiences and reduce isolation through shared participation.^{24,26,29} This is in line with previous studies which revealed that group prenatal care provides benefits such as alleviating stigma, enhance self-efficacy, and promote healthier pregnancy behaviors.³¹ Studies that explore the differences in group-based and home-based intervention approaches to determine their relative effectiveness and feasibility for adolescent pregnant mothers, while also examining how each approach addresses implementation challenges such as logistical barriers, cultural differences, and the need for trained facilitators are needed to cover this literature gap.

A notable finding from this review is that the interventions provided varied in terms of the intensity, reflecting differences in intervention design, delivery setting, and targeted psychosocial outcomes. Interventions range from brief psychosocial sessions lasting a few weeks to more extended programs including multiple components, such as educational, counseling, and physical activity programs over several months. High-intensity approaches provided frequent and continual contact with a healthcare provider from pregnancy until two years postpartum, suggesting that adaptive intervention designs may balance feasibility with clinical responsiveness.^{25,28} Programs with a moderate intensity relied on scheduled sessions delivered through different modalities, indicating a structured but time-limited approach to psychosocial support,^{24,26} and programs with a lower intensity prioritized scalability.^{27,29} Recent studies suggest that higher-intensity interventions often produce stronger psychosocial engagement but require greater cost, trained personnel, and sustained system capacity, which may limit accessibility in resource-limited settings.^{22,32} Conversely, lower-intensity interventions can expand reach and reduce delivery costs, but may require complementary support mechanisms to achieve meaningful behavioral change.^{32,33} These findings highlight the importance of identifying context-appropriate intensity levels that balance effectiveness, feasibility, and scalability when designing psychosocial support programs for pregnant adolescents.

Relevance and Adaptation for Indonesia

Indonesia has a strong primary health care system through community health center services (*Puskesmas*) and independent midwifery practices. Compared with the Nigerian study's model, which is integrated into primary maternal care

services, and the Australian study's facility-based approach, a model embedded in routine antenatal care (ANC) services appears most realistic for the Indonesian context. Interventions that can be integrated into ANC visits without establishing a new system are more structurally and administratively feasible. Adapting an intervention model that utilizes primary care services such as *Puskesmas* and midwives allows for the inclusion of support and education components without the need for new service infrastructure. This is a more realistic approach within the Indonesian health system than a stand-alone, resource-intensive model.

Adaptation is not only structural but also cultural. In the Indonesian context, adolescent pregnancy is strongly influenced by cultural and religious norms surrounding premarital sex, where premarital pregnancy is widely perceived as socially unacceptable and may lead to stigma and social pressure from both families and the broader community.³⁴ This requires a culturally sensitive, non-judgmental approach, and the inclusion of family support as a protective factor. Studies in Iran²⁴ demonstrate the importance of interventions developed through exploring the contextual needs of pregnant adolescents, which is relevant in Indonesia, where social norms and family values are highly dominant. Therefore, intervention models cannot be adopted directly without a process of cultural adaptation. Cultural adaptation can be achieved through reframing language to make it more non-stigmatizing and avoid netively labeling mental health, involving the family as the primary support system in the intervention process, integrating religious values as a coping mechanism aligned with community beliefs, and modifying delivery methods to suit local literacy levels and communication norms to make them more easily understood and accepted by pregnant adolescents.

In terms of technology, although many health intervention studies use SMS or phone systems, the Indonesian digital context demonstrates the dominance of instant messaging apps and social media. Recent digital reports indicate that WhatsApp is the most widely used app in Indonesia, with approximately 112 million active users, making it one of the primary communication platforms.³⁵ Therefore, if a digital component is to be integrated, a more realistic platform would be WhatsApp support groups or app-based reminder messages. This adaptation is crucial to ensure the intervention remains practical and relevant to the everyday communication patterns of Indonesian adolescents.

Limited human resources are also a crucial consideration in adapting psychosocial interventions in Indonesia. Various studies have shown that the distribution of health workers in *Puskesmas* remains uneven, with some regions experiencing shortages of doctors and midwives, particularly in remote areas and Eastern Indonesia.³⁶ This situation can increase the workload of health workers, particularly midwives, who are the primary providers of antenatal care at the primary level. Therefore, intervention models with high intensity, numerous face-to-face sessions, or complex multidisciplinary engagement may be difficult to implement widely. In this context, simpler, more structured intervention approaches that can be integrated into routine services by primary health workers after brief training are more realistic, while still providing necessary support to pregnant adolescents through a combination of face-to-face and digital approaches.

Overall, adaptive model for Indonesia is an intervention integrated within *Puskesmas*, low-cost, does not significantly burden the system, and uses a hybrid approach of face-to-face and simple digital support. This model allows for greater sustainability, scalability, and cultural acceptance, without relying on additional resources that are difficult to meet within Indonesia's current health system.

Limitations

This scoping review has several limitations that should be acknowledged. Only six studies met the inclusion criteria, indicating that the current evidence base on psychosocial programs for pregnant adolescents remains limited. The identified interventions were developed within specific sociocultural and health system contexts which may not fully reflect the diversity of Southeast Asian settings. As a result, direct transferability to Indonesia should be interpreted with caution. In addition, the present study proposes a conceptual adaptation rather than an empirically validated intervention model. The recommended adaptation strategies are derived from interpretive synthesis and contextual analysis and have not yet undergone stakeholder validation, feasibility assessment, or field testing within the Indonesian healthcare.

Recommendations

Future research should focus on developing and empirically testing culturally adapted psychosocial programs for pregnant adolescents within the Indonesian health system. Pilot implementation studies integrated into routine antenatal

care services at Puskesmas and midwifery practices are recommended to assess feasibility and acceptability in real-world settings. Further research should also explore the involvement of family members as part of the support system, given the strong influence of family structures in Indonesia. In addition, digital support components using commonly used platforms such as WhatsApp may be explored to enhance accessibility and continuity of psychosocial support for adolescents. Finally, stakeholder engagement, including healthcare providers, adolescents, and policymakers, is essential to ensure that future interventions are contextually relevant, culturally sensitive, and scalable within existing maternal health services.

Conclusion

This review highlights that psychosocial support programs demonstrate considerable potential to improve the well-being of pregnant adolescents by addressing emotional, social, and behavioral challenges during pregnancy and early motherhood. However, the review of existing programs also highlights several implementation challenges, including the need for sustained participant engagement, availability of trained facilitators, and the substantial time and resource commitments required for higher-intensity interventions. These challenges may limit the feasibility of implementing certain models, particularly in resource-constrained health systems. Therefore, future adaptations of psychosocial programs should focus on optimizing delivery strategies to enhance feasibility, cultural relevance, and scalability within the Indonesian context. Developing context-sensitive models that balance intervention intensity with available resources may improve program effectiveness while maintaining accessibility for pregnant adolescents. Overall, these findings underscore the importance of adapting evidence-based psychosocial interventions to strengthen supportive care for pregnant adolescents and promote healthier maternal-child outcomes in Indonesia.

Abbreviations

ANC, Antenatal Care; EPDS, Edinburgh Postnatal Depression Scale; LMICs, Low- and Middle-Income Countries; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; RCT, Randomized Controlled Trial.

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Disclosure

The authors report no conflicts of interest in this work.

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