



Evaluation of Preconception Health Services and Their Implications for Maternal and Neonatal Health: A Qualitative Study

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Abstract

Preconception health care is an effort to improve maternal and infant health by detecting and managing risk factors before pregnancy. This study aimed to evaluate preconception health services and their implications for maternal and newborn health status. This study used a qualitative evaluative design with the CIPP (Context, Input, Process, Product) approach. The study was conducted from May to December 2025 at five Community Health Centers (Puskesmas), the Office of Religious Affairs (KUA), BKKBN, and the Bantul District Health Office, Yogyakarta, Indonesia. A total of 52 participants were selected using purposive sampling, consisting of 38 premarital couples (who participated in Focus Group Discussions) and 14 key informants including health workers, health program holders, KUA staff, BKKBN officers, and a village head (who participated in in-depth interviews). Data were collected through in-depth interviews and Focus Group Discussions. Based on the CIPP framework, preconception services were found to be supported by cross-sectoral programs and the availability of basic services; however, implementation has not been optimal. Barriers identified included low community awareness, delayed access to services, variation in quality across Puskesmas, inconsistent SOPs, weaknesses in monitoring and evaluation, and poor data integration. Nevertheless, several indicators of maternal and newborn health service coverage from 2022 to 2024 showed improvement. Pregnancy and delivery complications decreased, while postpartum complications increased. The maternal mortality rate decreased, while the infant mortality rate fluctuated. It was concluded that preconception health services have the potential to contribute to increased service coverage and early detection of risk factors, but their impact on maternal and newborn health outcomes remains inconsistent. Strengthening service quality, standardization, cross-sectoral integration, and service continuity are needed to optimize maternal and infant health.

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1. INTRODUCTION

The issues of MMR, IMR, and other maternal and neonatal health problems in Indonesia remain critical concerns that require attention (Dinas Kesehatan Kabupaten Bantul, 2025). These can be prevented if the underlying risk factors are identified and addressed before pregnancy. Various scientific evidences indicate that preconception physical, mental, and social health conditions play a crucial role in determining pregnancy risks, pregnancy outcomes such as low birth weight (Khekade et al, 2023; Padhani et al., 2024), preterm birth, congenital anomalies, maternal morbidity during pregnancy and postpartum, and long-term impacts such as malnourished infants (Liu et al., 2025).

Preconception health care is defined as a series of interventions to identify and modify biomedical, behavioral, and social risk factors before pregnancy, with the aim of optimizing the health of the mother, father, and the unborn child (Benedetto et al., 2024). This concept of preconception health is recognized by the World Health Organization (WHO) as a crucial component of efforts to reduce maternal mortality rates (MMR) and infant mortality rates (IMR) and to improve overall reproductive health, as interventions prior to conception have been shown to significantly contribute to improved maternal and neonatal health outcomes (WHO, 2025).

In Indonesia, there are already preconception health care programs targeting adolescents, engaged couples, and couples of reproductive age. Preconception health care activities include the provision of counselling, health screening services, immunization, nutritional supplementation, medical services, and/or other health services (Kementerian Kesehatan Republik Indonesia, 2021). Pre-marital programs are conducted at the Office of Religious Affairs and organized by the Marriage Advisory, Guidance, and Preservation Board in collaboration with the health department (Direktorat Jenderal Bimbingan Masyarakat Islam, 2013) with community health centers serving as the implementing agencies. There are other programs utilizing technology, such as the *elsimil* app (Putri, Sutoyo, & Rostikawati, 2025; Stiawati et al., 2025) and the *kescatin* app (Indrasari et al., 2025; Setiawan et al., 2025).

National data indicate that the coverage of preconception health examinations varies across regions, with the national average failing to meet the target. This situation directly impacts the health status of women planning pregnancy, as many enter pregnancy with conditions such as anemia, malnutrition, or insufficient immunity against certain infections (Kementerian Kesehatan Republik Indonesia, 2025). An evaluation of preconception health care programs is crucial to identify gaps between policy and on-the-ground practice. Despite the availability of several preconception care programs in Indonesia, existing studies have focused primarily on single program components, specific subgroups, or quantitative coverage metrics, without providing a comprehensive evaluation of program implementation across multiple institutional stakeholders. Furthermore, most previous research has not used a structured evaluation framework such as the CIPP model, limiting the ability to assess whether programs are contextually relevant, adequately resourced, properly implemented, and producing meaningful outcomes. These gaps highlight the need for a holistic, multi-stakeholder evaluation that can generate actionable evidence for program improvement. A comprehensive evaluation approach using the CIPP model (Context, Input, Process, Product) enables a thorough analysis of various program dimensions, ranging from policy relevance, resources, implementation processes, to the resulting impacts. This study aimed to evaluate preconception health services and their implications for maternal and newborn health status.

2. METHODS

This study is an evaluative study using a qualitative approach aimed at evaluating the implementation of preconception health services using the Context, Input, Process, and Product (CIPP) evaluation model. All authors are experienced in qualitative research. The first author (SAA) is a female midwife. LB is a female midwife. NTSS is a female public health. This research involved five Community Health Centers, a Village Office, the National Population and Family Planning Agency, the Office of Religious Affairs, and the Health Department in Bantul Regency, Yogyakarta, Indonesia.

The study was conducted from Mei to December 2025, with 52 participants selected using purposive sampling techniques to identify and select information-rich participants related to preconception care. Participants were included if they: (1) were premarital couples registered at the Office of Religious Affairs in Bantul Regency and had undergone or were scheduled to undergo preconception health services; or (2) were health professionals, program holders, or administrative officers directly involved in the planning, delivery, or oversight of preconception health services in Bantul Regency. Participants were excluded if they: (1) were not able to communicate verbally in Indonesian; (2) declined to provide informed consent; or (3) had no direct involvement in or experience of preconception health services. Of these participants, 38 were premarital couples, two were health program holders, nine were health workers at the community health center, a staff of the religious affairs office, two staff of The National Population and Family Planning Agency (BKKBN) and a village officer. All participants and research team members had yet to meet each other before the study. No one dropped out during data collection in the study. No one else was present besides the participants and researchers.

Data were collected face-to-face via seven FGDs (with 38 premarital couples) in The Religious Affairs Office and 14 in-depth interviews in the workplace (with health workers, health program holders, The National Population and Family Planning Agency officer (BKKBN), and village officers) conducted by the first author (SAA). The average time of each FGD and in-depth interview was 45–60 min using a reliable guide. The FGDs and in-depth interviews were conducted in Bahasa (Indonesian language) and voice recorded. Field notes were made during and after each data collection. FGD was conducted with a group of prospective brides and grooms. This method was chosen due to its ability to foster dynamic interactions, gather diverse perspectives, and facilitate the synergy of ideas and group analysis. In-depth interviews were conducted with the implementers of the PCC program to collect more detailed and specific data.

Audio recorded data were transcribed and analyzed using thematic analysis to themes within the data using open code 4.03 (Department of Epidemiology and Global Health, 2022). We followed the six stages of thematic analysis outlined by Braun and Clarke (Braun & Clarke, 2006). It included generating initial codes from participant transcripts, grouping codes with similar semantic meanings, and grouping to form themes. We used explicit or surface meaning of transcript content to form themes rather than through interpretation by the research team. Two coders (SAA and LB) generated code, and all authors participated in categorizing and determining the theme. The research team discussed and refined the themes until we reached a consensus. Data were further collected and examined with the same step until data was saturated. Data saturation was determined when no new codes, categories, or themes emerged from the analysis of additional transcripts, and when the existing themes had been sufficiently elaborated and confirmed across multiple participants and data sources. In practice, saturation was assessed after each round of data collection and analysis; new participants continued to be recruited until two consecutive FGD or interview sessions yielded no new thematic content. To ensure trustworthiness, credibility was established through prolonged

engagement in the field, member checking by returning a summary of findings to key participants for verification, and investigator triangulation involving two independent coders (SAA and LB). Transferability was supported by providing a detailed description of the study context, participants, and data collection procedures to enable readers to assess applicability to other settings. Dependability was maintained through an audit trail documenting all methodological decisions and changes throughout the research process, as well as regular team debriefings. Confirmability was ensured through reflexivity practices, in which each researcher reflected on and documented their potential biases and assumptions. Regarding researcher reflexivity, all authors are experienced in qualitative research. None of the research team members had prior relationships with the participants, and all participants and research team members had yet to meet each other before the study. The research team acknowledged their familiarity with the local health system context and actively bracketed preconceptions during analysis to minimize the influence of prior assumptions on interpretation. The study reporting followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (Tong et al., 2007).

This research has obtained an ethical clearance from Univeritas Jenderal Achmad Yani Yogyakarta, Indonesia, No. SKep/092a/KEP/III/2025. Before obtaining the data, all participants signed informed consent.

3. RESULTS AND DISCUSSION

Participant characteristics are described in detail in Table 1. The total number of participants in this study was 52, consisting of 37 participants in Focus Group Discussions (FGDs) and 15 participants in in-depth interviews. Most FGD participants were female (n=21), aged 20–35 years, had a senior high school education, and worked in the private sector. Meanwhile, most in-depth interview participants were female, aged 36–50 years, had a diploma/bachelor's degree education, and worked as health workers.

Table 1. Characteristics of participants.

Characteristics	FGD	In-depth Interview
Gender		
Male	16	4
Female	21	11
Total	37	15
Age		
Age 20-35 years old	35	5
Age 36-50 years old	0	8
Age 51-65 years old	0	4
Total	35	17
Level of Education		
Senior High school	30	0
Diploma/Bachelor	6	15
Postgraduate	0	1
Total	36	16
Occupation		
Government employees	4	0
Private employees	15	0
Entrepreneur	11	0
Unemployed	5	0

Village officer	0	1
The Office of Religious Affairs officer	0	1
The National Population and Family Planning Agency officer	0	2
Health workers at Community Health Center	0	11
Health Program holder at Health Department	0	2
Total	35	17

The evaluation of the preconception health care program in this study used the CIPP (Context, Input, Process, Product) model as a systematic framework to assess the program's relevance, resource readiness, quality of implementation, and overall service outcomes.

Table 2. Table of citations and themes.

Model Constructs	Theme	Citation
Context	Policies and regulations regarding preconception health programs	<ol style="list-style-type: none"> 1. <i>"Yes, there are policies that encourage prospective couples to receive health education and checkups as part of their wedding preparations."</i> (Interview with the Head of the Office of Religious Affairs, 57 years old). 2. <i>"Services to assess their health (brides-to-be) already exist... there are service packages at community health centers and an app (Kescatin) as well..."</i> (Interview with the Head of the Community Health Center, 41 years old). 3. <i>"...since 2022, there has been a program from BKKBN that we call Elsimil... this program is supported by policies related to accelerating the reduction of stunting and family development..."</i> "...there is no obligation yet for them to join Elsimil..." (Interview with BKKBN staff, 39 years old).
	Community needs for preconception health services	<ol style="list-style-type: none"> 4. <i>"In our service area, the need for preconception health services is quite high because many prospective couples have never undergone a health checkup before marriage. They generally only realize the importance of such examinations after being directed by health workers or the Office of Religious Affairs."</i> (Interview with the Head of the Community Health Center, 43 years old). 5. <i>"In our view, the services provided are already quite appropriate because they help prospective couples understand the importance of health before pregnancy..."</i>

Model Constructs	Theme	Citation
		(Interview with the Head of the Office of Religious Affairs, 58 years old).
		6. <i>"Preconception services are not yet evenly distributed... common issues include malnutrition, unhealthy lifestyles, and diseases—both infectious and chronic."</i> (Interview with a general practitioner, 44 years old).
	Community Mindset Regarding Preconception Health	7. <i>"...it's taboo...when the Community Health Center displays images...of reproductive organs, some people feel scared and so on"</i> (Interview with Head of Village, 58 years old).
		8. <i>"...hehe...it's awkward to talk about intimate matters...embarrassing"</i> (FGD with a Bride-to-be, 32 years old).
		9. <i>"If you're not pregnant yet, it's not important"</i> (FGD with a Bride-to-be, 28 years old).
		10. <i>"I don't think a check-up before pregnancy is necessary yet, since I'm not pregnant"</i> (FGD with a Bride-to-be, 27 years old).
	Accessibility of services	11. <i>"Health service facilities are available and sufficient, but their utilization isn't optimal yet because not all prospective brides and grooms come in early for health checkups..."</i> (Interview with the Health Program Holder of Health Department, 43 years old).
		12. <i>"...there are differences in services between Community Health Centers...all sorts of things, right? Maybe that should be communicated to us as well..."</i> (FGD with a Bride-to-be, 26 years old).
		13. <i>"...as for the next steps—where I'm supposed to go after this—I wasn't told, so I had to figure it out on my own..."</i> (FGD bride-to-be, 27 years old).
		14. <i>"The current service schedule isn't fully aligned with the needs of the target group, since many people work, while the classes are held during work hours"</i> (Interview with the Social Affairs Officer, 58 years old).
Input	Human Resources	15. <i>"...there are three staff members for binwin, and that's enough... individual-based counseling is more effective, but the timing is difficult because staff resources are</i>

Model Constructs	Theme	Citation
		<p><i>limited...</i>” (Interview with Social Affairs Officer, 58 years old).</p> <p>16. “...as for midwives, we have enough...but as for psychologists, we definitely don’t have enough...” (Interview with the Head of the Community Health Center, 45 years old).</p> <p>17. “...we don’t have psychologists yet, and we don’t require them because midwives can also provide counseling...” (Interview with the Health Program Holder of Health Department, 37 years old).</p> <p>18. “...if others also go to a psychologist, I didn’t have one at the time” (FGD with a Bride-to-be, 32 years old).</p> <p>19. “(The TPK) consists of three components: midwives, PKK cadres, and family planning cadres...” (Interview with BKKBN, 31 years old).</p>
	Facilities and Infrastructure	<p>20. “The available facilities and infrastructure sufficiently support basic services, as we have a service room, physical examination tools, simple laboratory equipment, and educational materials. However, not all facilities are specifically available for preconception care...” (Interview with the Head of the Community Health Center, 45 years old).</p> <p>21. “The distribution of preconception health booklets... the quantity is limited...” (Interview with the Health Program Holder of Health Department, 43 years old).</p> <p>22. “When I took the premarital course, I didn’t receive a booklet from the KUA (the Religious Affairs Office)...” (FGD with a Bride-to-be, 27 years old).</p> <p>23. “But since we don’t have all the educational materials here yet, it’s just regular (verbal) education...” (Interview with a psychologist, 27 years old).</p> <p>24. “...nuwun sewu (I’m sorry), the phone’s storage might be limited if asked to download an app...” (Interview with the Head of the Community Health Center, 44 years old).</p>
	Program funding	<p>25. “...the traditional kind is indeed an official program from the Ministry of Religious</p>

Model Constructs	Theme	Citation
		<p><i>Affairs...funded by the state</i>" (Interview with Social Affairs Officer, 58 years old).</p> <p>26. <i>"Yes, the health center has one; we have our own budget, and then from the village... there's also a budget for that..."</i> (Interview with the Midwife at the Community Health Center, 42 years old).</p> <p>27. <i>"whereas in our sub-district it's only once... at the health center it's twice a year"</i> (Interview with Village Head, 58 years old).</p> <p>28. <i>"...the Health Department doesn't have a budget for media programs... I think the health center is also lacking"</i> (Interview with the Health Program Holder of Health Department, 38 years old).</p> <p>29. <i>"The books are limited... we just wait for them to be distributed from above (the Ministry of Religious Affairs)... because there's no specific budget for that"</i> (Interview with the Head of the Office of Religious Affairs, 45 years old).</p> <p>30. <i>"(Health checkups) aren't covered by BPJS (Indonesian Health Insurance Agency). So they're self-funded."</i> (Interview with the Midwife at the Community Health Center, 42 years old).</p> <p>31. <i>"...we can't yet provide free prenatal screenings even though this is actually part of the program...the hope is that they'll realize the importance and be willing to pay..."</i> (Interview with the Health Program Holder of Health Department, 37 years old).</p>
	Guidelines and SOPs	<p>32. <i>"...As for guidelines and SOPs, there aren't any from the health department yet, so the community health centers create their own...so they're not uniform or standardized."</i> (Interview with the Health Program Holder of Health Department, 38 years old).</p> <p>33. <i>"There are no guidelines yet, but there is something like an SOP, though it's incomplete."</i> (Interview with the Head of the Community Health Center, 44 years old).</p> <p>34. <i>"...Elsimil has SOPs, and there are even guidelines"</i> (Interview with a staff member from the Elsimil Program Section at the Bantul BKKBN, 39 years old).</p>

Model Constructs	Theme	Citation
	Information and recording systems	35. <i>"Binwin (marriage counseling) has guidelines..."</i> (Interview with the Head of the Community Health Center, 44 years old).
		36. <i>"Actually, for record-keeping at the health center, we're already using an information system, but it's not yet integrated with the KUA (the Religious Affairs Office)"</i> (Interview with the Head of the Community Health Center, 44 years old).
		37. <i>"...there is an information system, but it's not yet complete..."</i> (Interview with the Midwife at the Community Health Center, 42 years old).
	Networks/partnerships	38. <i>"...as for cross-sectoral collaboration, whether with the KUA (the Religious Affairs Office), the Community Health Center, or the village administration, there is cooperation, but it's not yet routine; often, each operates independently."</i> (Interview with the Midwife at the Community Health Center, 43 years old).
		39. <i>"...the Office of Religious Affairs and the Community Health Center can work in tandem (with BKKBN) ... because their objectives are nearly the same"</i> (Interview with BKKBN staff, 39 years old).
		40. <i>"...that health check-up package for engaged couples includes educational components through collaboration with the Office of Religious Affairs... will conduct the pre-marital classes, and the Community Health Center will be invited"</i> (Interview with the Health Program Holder of Health Department, 37 years old).
		41. <i>".... well, actually, it hasn't been integrated like that yet..."</i> (Interview with the Head of the Office of Religious Affairs, 58 years old).
		42. <i>"Preconception services (at the Community Health Center) are not yet evenly distributed"</i> (Interview with the Health Program Holder of Health Department, 43 years old).
Process	Service Implementation	43. <i>"...the services aren't optimal because they aren't scheduled... we've had patients waiting like that—it's just a quick, one-off thing..."</i> (Interview with a general practitioner, 44 years old).

Model Constructs	Theme	Citation
		<p>44. "...so not all couples can attend the group classes... we include them in the self-directed program... once a couple comes in, we counsel them, so there's someone every day..." (Interview with the Head of the Office of Religious Affairs, 53 years old).</p> <p>45. "...once they've received an examination at the community health center, the couple can complete their data in Elsimil... results can be generated immediately, indicating whether they're at risk or in the ideal category..." (Interview with BKKBN staff, 39 years old).</p>
	Scope of services provided	<p>46. ".....at the KIA, there's anamnesis, and we also discuss family planning and other matters, then administer the TT vaccine... and folic acid..." (Interview with the Midwife at the Community Health Center, 42 years old).</p> <p>47. "...there (general clinic) we take a medical history... after that, we conduct health screenings like checking blood pressure and vital signs" (Interview with a general practitioner, 40 years old).</p> <p>48. "...pregnant women undergo a dental examination to see if there are any problems with their teeth and mouth." (Interview with a dentist, 43 years old).</p> <p>49. "...in my case, there's no dental aspect, but there's a psychological one... it's different..." (FGD with a Bride-to-be, 27 years old).</p> <p>50. "For men, we'll check their blood type and blood sugar... for example, if their blood pressure is a bit high when they come in... we'll also do a urine test for protein... that's mandatory... for pregnant women, we do a PP test, hemoglobin, protein... blood type, and glucose... there might be a urinary tract infection... and this one is a test for toxoplasmosis" (Interview with Laboratory Technician, 55 years old).</p> <p>51. "...weight, height, then upper arm circumference, then we assess their BMI, nutritional status..., whether they're malnourished or not..." (Interview with a Nutritionist, 39 years old).</p>

Model Constructs	Theme	Citation
		52. <i>"...then the psychologist... needs to screen for any mental health issues"</i> (Interview with the Health Program Holder of Health Department, 37 years old).
	Quality of interaction between staff and clients	53. <i>"...well, when interacting with expectant mothers, we strive to be as thorough as possible and do not discriminate"</i> (Interview with the Health Program Holder of Health Department, 44 years old). 54. <i>"The results of the examination weren't explained in detail... So it felt rushed..."</i> (FGD with a Bride-to-be, 28 years old). 55. <i>"...counseling at each clinic is quite comprehensive and the staff are friendly..."</i> (FGD with a Bride-to-be, 26 years old).
	Participation of the target group	56. <i>"...sometimes they come here (to the Community Health Center) just as a formality..."</i> (Interview with a psychologist, 30 years old). 57. <i>"...just for the formality...because that's just a requirement for marriage..."</i> (FGD with a Bride-to-be, 27 years old). 58. <i>"They (the engaged couples) seem indifferent during the counseling sessions... because they don't really need it, you know"</i> (Interview with the Head of the Office of Religious Affairs, 58 years old). 59. <i>"The activities are held on weekdays, so many have to take time off...maybe because of work"</i> (Interview with Head of Village, 58 years old) . 60. <i>"...it's hard to get time off on weekdays..."</i> (FGD with a Bride-to-be, 26 years old). 61. <i>"...it turns out that not many have enrolled there (Elsimil)"</i> (Interview with the Midwife at the Community Health Center, 42 years old). 62. <i>"It's still very minimal (Elsimil participation)..."</i> (Interview with BKKBN staff, 39 years old).
	Monitoring and supervision	63. <i>"...but the evaluation is probably the weakest part there"</i> (Interview with the Health Program Holder of Health Department, 43 years old). 64. <i>"...there hasn't been any monitoring or evaluation yet, so we also don't know the challenges...and the results..."</i> (Interview

Model Constructs	Theme	Citation
		with the Head of the Community Health Center, 45 years old).

Context

Policies and regulations for preconception health programs

There is support from cross-sectoral policies and programs for the health preparation of prospective brides and grooms, through counseling and examinations at the Religious Affairs Office, integrated services at community health centers including the Kescatin app, as well as the Elsimil program from BKKBN as part of efforts to accelerate the reduction of stunting and family development. There is no policy yet requiring participation in Elsimil (Table 2, Quote 1-3).

Community needs for preconception health

The need for preconception health services remains high, primarily due to low awareness among prospective couples regarding the importance of pre-marital health screenings. While available services are considered helpful in enhancing understanding of the importance of pre-pregnancy health, their implementation remains uneven and faces various challenges, such as malnutrition, unhealthy lifestyles, and the presence of infectious and chronic diseases among prospective couples (Table 2, Quote 4-6).

Community mindset regarding preconception health

Socio-cultural factors and individual perceptions remain barriers to the utilization of preconception health services. Discussions regarding reproductive health are often considered taboo and cause feelings of shame, thereby reducing openness to receiving information. Additionally, there is a perception that health screenings are not yet necessary before pregnancy occurs, reflecting low awareness of the importance of preventive measures starting from the preconception period (Table 2, Quote 7-10).

Accessibility of services

Preconception health care facilities are available, but their utilization remains suboptimal. This is influenced by delays among prospective brides and grooms or couples of reproductive age in accessing services, variations in service quality and information across community health centers, and a lack of clarity regarding the service process for users. Furthermore, the mismatch between service schedules and the free time of the target population—particularly for those who work—also poses a barrier to accessing services (Table 2, Quote 11-14).

Inputs

Human Resources

The availability of human resources in preconception health services is generally sufficient, both at the Religious Affairs Office, community health centers, and for the implementation of the Elsimil program. However, there are still limitations regarding certain personnel, such as psychologists, as well as time constraints for providing more individualized counseling. Furthermore, the uneven distribution of psychologists and variations in service experience at the user level indicate that the quality and scope of services still need to be improved (Table 2, Quote 15-19).

Facilities and Infrastructure

Facilities and infrastructure for preconception health services are generally adequate for basic services, but are not yet fully specialized or evenly distributed. Limitations are still found in the availability of educational materials, such as printed guidebooks, which are in limited supply. Furthermore, the use of digital-based services (Elsimil) also faces technical challenges at the user level, such as limited device capacity, which has the potential to hinder access to information and services (Table 2, Quote 20-24).

Program Funding

Funding support for preconception health services is available from various sources, such as the Ministry of Religious Affairs, community health centers, the National Population and Family Planning Board (BKKBN), and village governments. However, budget allocations remain uneven and limited, particularly regarding the provision of educational materials and the implementation of activities. Furthermore, there is currently no coverage through the Indonesian Health Insurance Agency (BPJS) for health screenings, resulting in services that remain self-funded—a situation that could pose an access barrier for some target groups (Table 2, Quote 25-31).

Guidelines and SOPs

The availability of guidelines and standard operating procedures (SOPs) for preconception health services is not yet uniform across community health centers. Some services still rely on SOPs developed independently by the community health centers, which are incomplete, potentially leading to variations in implementation. However, for specific programs such as Elsimil and premarital counseling at the Religious Affairs Office, guidelines and SOPs are now more clearly defined (Table 2, Quote 32-35).

Information and recording systems

The preconception health service recording system at community health centers has utilized information systems, but they are not yet functioning optimally. Limitations are still evident in the incompleteness of system features and the lack of data integration with the Religious Affairs Office, thereby hindering coordination and information exchange across sectors (Table 2, Quote 36,37).

Networking/Partnerships

The preconception program requires integration among agencies such as the village office, the Religious Affairs Office, and community health center, as the objectives of each agency for the program are essentially the same. Therefore, if the program can be made integrative rather than operating in isolation, the likelihood of success is higher. A form of collaboration between the Religious Affairs Office and the community health center involves providing education. The Religious Affairs Office is responsible for gathering preconception couples into a class, then inviting the community health center to provide health education (Table 2, Quote 38-41).

Process

Service Implementation

The preconception health service flow at the community health centers begins with registration, followed by the Maternal and Child Health (MCH) clinic, Laboratory, General Clinic, Nutrition Clinic, Dental Clinic, Psychology Clinic, returning to the MCH clinic, and finally picking up medication at the pharmacy. In practice, there is no specific schedule,

so service delivery is not optimal. Marriage counseling sessions organized by the Religious Affairs Office are limited, so not all prospective couples can participate in group sessions; consequently, some receive individual counseling. The use of the Elsimil application has also aided in assessing the health risks of prospective couples, although service integration and coverage still need to be improved (Table 2, Quote 42-45).

Scope of services provided

Preconception services at the Community Health Center include services similar to those at the Maternal and Child Health clinic, general outpatient services for health screenings, mandatory laboratory tests for women such as blood type, hemoglobin (Hb), blood sugar, and the PP test, nutritional status assessment, dental examination, followed by Tetanus toxoid (TT) vaccination, and finally, female prospective brides also receive folic acid. Laboratory tests for male prospective grooms include blood type, blood sugar, and urine protein reduction if indicated. Health education is conducted in each clinic. However, service delivery remains uneven, and there are variations among community health centers, both in the types of examinations and the scope of services provided (Table 2, Quote 46-52).

Quality of interaction between staff and clients

Services for prospective brides and grooms are generally provided fairly and with a friendly attitude on the part of staff, supported by fairly comprehensive counseling. However, the quality of information delivery is inconsistent, marked by explanations of examination results that lack depth and seem rushed (Table 2, Quote 53-55).

Target participation

Participation of prospective couples in preconception health services remains low and tends to be merely a formality to meet marriage administrative requirements. This low engagement is influenced by the perception that the services are not yet a necessity, as well as time constraints due to the scheduling of activities on weekdays. Additionally, the utilization of supporting applications such as Elsimil remains minimal (Table 2, Quote 56-62).

Monitoring and supervision

Monitoring and evaluation aspects in the implementation of preconception health services are still suboptimal. Limitations in evaluation activities result in a lack of information regarding implementation challenges and program achievements (Table 2, Quote 63,64).

Table 3. Table of Coverage of health services related to preconception and maternal-neonatal health

Type of coverage	Year		
	2022	2023	2024
K4 Coverage	81.1%	81.5%	85.5%
K6 Coverage	75.8%	80.2%	97.6%
TTD Coverage	81.3%	84.4%	91.3
Coverage of deliveries in health facilities	99.9%	99.9%	99.8
Postpartum visit coverage	96.1%	96.6%	97.2
First neonatal visit coverage (KN1)	84%	84.6%	98.3
Coverage of complete neonatal visits	82.6%	83.4	97.4

Based on the table 3, the coverage of health services related to preconception and maternal-neonatal health shows an upward trend from 2022 to 2024, although some indicators were already very high from the outset. In preconception services, K4 coverage rose from 81.1% in 2022 to 85.5% in 2024, K6 coverage increased more sharply from 75.8% to 97.6%, and TTD administration also increased from 81.3% to 91.3%. This indicates an improvement in access to and utilization of health services before and during pregnancy.

Regarding childbirth and neonatal care, the rate of facility-based deliveries remained very high and relatively stable, at 99.9% in 2022 and 2023, and 99.8% in 2024. Postpartum visit coverage has also consistently increased from 96.1% to 97.2%, indicating that postpartum maternal monitoring is proceeding well. Meanwhile, the first neonatal visit (KN1) rose from 84.0% to 98.3%, and the rate of complete neonatal visits increased from 82.6% to 97.4% in 2024.

Overall, these data illustrate that preconception and maternal-neonatal health services have strengthened year over year. The most notable improvements are seen in the coverage of K6, KN1, and complete KN visits, which can be interpreted as an expansion of service reach, improved visit adherence, and enhanced continuity of care for mothers and infants. These findings indicate that more optimal services have the potential to support better maternal and neonatal health status.

Table 4. Table of Changes in maternal and neonatal health status

Maternal health complications	2023	2024
Pregnancy	3,787	1,268
Childbirth	3,787	210
Postpartum	161	635

Based on the results of the table 4 showing changes in maternal and neonatal health status, complications during pregnancy, childbirth, and the postpartum period are still reported every year. Pregnancy complications decreased from 3,787 cases in 2023 to 1,268 cases in 2024. Complications during childbirth also saw a significant decrease, from 3,787 cases in 2023 to 210 cases in 2024. However, there was an increase in postpartum complications, rising from 161 cases in 2023 to 635 cases in 2024. These findings suggest that preconception and maternal-neonatal health services may potentially be associated with reduced complications during pregnancy and childbirth, but strengthening postpartum services remains essential to further optimize maternal and neonatal health outcomes.

Contribution to maternal and neonatal outcomes

Prenatal health programs at community health centers actually already exist, but their implementation has not been optimal, and to date, the maternal mortality rate has shown a declining trend, though it remains at a level requiring continued attention.

Table 5. Table of maternal and infant mortality rates.

Indicator	Year		
	2022	2023	2024
Maternal Mortality Rate (MMR)	146.88 per 100.000 live births (16 deaths out of 10.893 live births)	84.36 per 100.000 live births (9 deaths out of 10.669 live births)	84.12 per 100.000 live births (8 deaths out of 9.581 live births)
Infant Mortality Rate (IMR)	8.3 per 1.000 live births	7.59 per 1.000 live births	8.93 per 1.000 live births

Based on the table 5 showing contributions to maternal and neonatal outcomes, prenatal health programs are available at community health centers, but their implementation has not yet been optimal. This is reflected in the maternal mortality rate (MMR), which decreased from 146.88 per 100,000 live births in 2022 to 84.36 in 2023, and dropped slightly further to 84.12 in 2024. Nevertheless, the MMR still indicates cases of maternal deaths that require serious attention.

Regarding the infant mortality rate (IMR), there was a decrease from 8.3 per 1,000 live births in 2022 to 7.59 in 2023, but it rose again to 8.93 in 2024. These findings suggest that preconception health services may potentially be associated with maternal and neonatal outcomes; however, given that multiple factors may influence trends in MMR and IMR, these relationships should be interpreted cautiously and cannot be directly attributed to the program based on this study design alone. Continued improvements in implementation quality are needed to better understand and support the reduction of maternal and infant mortality risks.

The results of this study provide a comprehensive overview of system readiness, the quality of service processes, and their impact on maternal and neonatal health. These findings are further discussed based on the Context, Input, Process, and Product components within the CIPP evaluation framework.

The context evaluation examines the relevance and foundation of the program in relation to the actual needs of the target population. The study results indicate that the evaluation of preconception health services is determined not only by program availability but also by the strength of the policy context, social acceptance, and actual access at the service level. Cross-sectoral support through the Religious Affairs Office, community health centers, and the National Family Planning Board (BKKBN) is available; however, it is not yet accompanied by mandatory participation, equitable implementation, or sufficient public awareness to utilize the services. These findings align with recent literature that positions preconception as a strategic intervention to improve maternal and infant outcomes through the control of modifiable risk factors before pregnancy, but its effectiveness is highly dependent on service integration and the feasibility of implementation (Khekade et al., 2023; Lassi et al., 2021).

The high demand for preconception services in this study, primarily due to the still-low public awareness regarding health checkups before marriage, highlights a gap between epidemiological needs and service-seeking behavior. Sociocultural barriers such as the perception of reproductive health issues as taboo, feelings of shame, and the belief that checkups are unnecessary before pregnancy contribute to the low utilization of services. This situation is consistent with findings from implementation studies indicating that the primary barriers to preconception care lie not only in systemic issues but also in low service demand, limited awareness, and the perception that preconception care is not a priority before pregnancy occurs (Andriani et al., 2022; Ismail et al., 2025). Public attitudes and beliefs regarding preconception significantly impact couples' participation in preconception health programs. Additionally, concealing reproductive health issues has negative implications for the accuracy of diagnosis and management of problems by healthcare providers (Fernández-Martínez et al., 2020; Briggs, 2021).

In addition to cultural factors and perceptions, service accessibility also poses a challenge in this study. Although service facilities are available, their utilization remains suboptimal due to delays in prospective couples accessing services, variations in service quality across community health centers, unclear service procedures, and service schedules that do not align with the needs of the working target population. These conditions indicate that the availability of services has not been fully accompanied by ease of access and affordability for the community. Previous research has shown that factors

such as accessibility, socioeconomic status, and distance to health facilities are significantly associated with the continuity of maternal and neonatal care from antenatal to postnatal care (Andriani et al., 2022; Rammohan et al., 2024).

From the input perspective, this study reveals that human resources, infrastructure, and funding are available but not yet robust enough to ensure equitable service quality. The shortage of psychologists, limited time for individual counseling, inadequate educational materials, technical constraints for digital services, and the absence of BPJS coverage for preconception examinations indicate that system readiness remains incomplete. The WHO emphasizes that the quality of maternal and neonatal care is significantly influenced by the readiness of competent and multidisciplinary health personnel, including mental health support during the preconception and pregnancy periods (WHO, 2022). Therefore, the shortage of professionals such as psychologists in this study may affect the quality of mental health screening and counseling for couples planning a pregnancy. Recent literature confirms that the success of preconception care is heavily influenced by the adequacy of resources, clarity of funding, infrastructure readiness, and uniform service standards; without these, services tend to function as administrative programs rather than effective preventive interventions (Hristova-Atanasova et al., 2025; Ismail et al., 2025).

The inconsistency in guidelines and SOPs among community health centers in this study is also important to note as it has the potential to result in variations in service quality. Some community health centers still develop their own SOPs, which are incomplete, while the recording system is not yet integrated with the Religious Affairs Office, resulting in suboptimal cross-sectoral coordination. This aligns with recent recommendations that standardization of guidelines, integrated record-keeping, and a multi-level service model are crucial to ensuring continuity of preconception care through pregnancy, childbirth, and the postpartum period (Ministry of Health of Ethiopia, 2024; WHO, 2022).

In terms of process, the preconception service workflow at community health centers already includes relatively comprehensive components, ranging from registration, maternal and child health (MCH) examinations, laboratory services, general outpatient clinics, nutrition, dentistry, psychology, to pharmacy. Examinations have also included important components such as Hb, blood sugar, nutritional status, TT immunization, and folic acid supplementation for prospective brides, although implementation varies across health centers and not all services are running optimally due to the lack of a specific schedule. Conceptually, these findings align with evidence that effective preconception care must indeed be multidomain, encompassing risk assessment, nutritional interventions, micronutrient supplementation, education on healthy behaviors, as well as early detection of chronic diseases and infections prior to conception (Khekade et al., 2023; Lassi et al., 2021; Yulivantina et al., 2021).

The CDC (2023) recommends that anyone planning to become pregnant schedule a preconception health checkup. Through medical history and preconception health examinations, health status can be determined, including genetic history, nutritional status, medical history, mental health history, vaccination history, and health behavior screening, so that if a health problem arises, it can be addressed immediately before the couple decides to conceive. The sooner a health condition is identified, the sooner the health problem can be addressed.

However, this study also indicates that target group participation remains low and is often merely a formality to meet marriage administrative requirements. This low engagement is exacerbated by service delivery occurring on weekdays, the perception that the service is not yet a necessity, and the minimal utilization of Elsimil. From an implementation perspective, these conditions indicate that program coverage does not

always equate to the internalization of benefits by the target population; recent studies confirm that low demand-side engagement is a major barrier that can reduce the impact of preconception care on maternal and neonatal outcomes (Hristova-Atanasova et al., 2025; Ismail et al., 2025).

The quality of interactions between staff and clients in this study was generally quite good, as services were perceived as fair, staff were friendly, and counseling was available. However, the explanation of examination results, which was sometimes not in-depth and seemed rushed, indicates that the quality of communication does not yet fully support behavioral change. This finding is important because the benefits of preconception care are determined not only by the availability of examinations but also by the quality of counseling, which can enhance couples' understanding, adherence, and readiness to address risk factors before pregnancy (Khekade et al., 2023; Lassi et al., 2021).

The product component indicates improvements in the achievement of preconception and maternal-neonatal health services, reflected in the increased coverage of K6, TTD administration, KN1, and complete KN. Increased coverage from the antenatal to the neonatal phase is crucial because the success of services is not determined by a single service contact but by the continuity of care from pregnancy through the postpartum period and into the newborn stage; the WHO also emphasizes that the quality and coverage of services during this period still need to be strengthened to reduce mortality and morbidity (WHO, 2024). This trend can be interpreted as a strengthening of the continuity of care from the preconception period through pregnancy to the neonatal period, and is consistent with the latest evidence-based framework that positions preconception as part of the continuum of care to improve maternal and infant health (Andriani et al., 2022; Seidu et al., 2022; WHO, 2022).

The findings of this study also indicate variations in services across community health centers, low target group participation, weak monitoring and evaluation, and suboptimal integration of data and standard operating procedures—in line with previous research stating that the quality of continuum of care implementation is a stronger determinant of health outcomes than merely increasing service coverage (Seidu et al., 2022).

The high rate of deliveries at health facilities reflects strong access to medical care and an effectively functioning referral system in Indonesia. This trend has consistently increased, thereby enhancing the likelihood of early detection of various risks of obstetric complications (Novianty et al., 2023). The extensive service coverage indicates that management of obstetric emergencies can be carried out more quickly and effectively to reduce maternal mortality rates (Chauke, 2025).

The results of this study show a decrease in pregnancy complications and a decrease in delivery complications, but postpartum complications have actually increased. These findings suggest that strengthening preconception care and services during pregnancy may have contributed to early detection and risk management during the antenatal and intrapartum phases; however, the continuity of care during the postpartum period remains a weak point requiring more serious attention (WHO, 2022). The high prevalence of anemia, undernutrition, and the continued occurrence of postpartum complications indicate that the program's impact has not yet been fully optimized and is not evenly distributed across all stages of the continuum of care (Albarqi, 2025). Preconception care should not be evaluated solely based on the success of increasing coverage, but also on its ability to consistently improve health status before pregnancy and reduce the risk of maternal-neonatal complications (Khekade et al., 2023).

The rise in postpartum complications is particularly relevant when considered in light of WHO recommendations regarding the importance of quality postnatal care for mothers

and newborns. The WHO emphasizes that a positive postnatal experience and essential postnatal services form the foundation for improving both short-term and long-term health outcomes for mothers and infants. Thus, the findings of this study indicate that the benefits of preconception care will not be fully realized unless they are followed by strengthened service transitions into the postpartum period, including monitoring for complications, follow-up counseling, nutritional support, mental health support, and timely referrals (WHO, 2022).

The decline in maternal mortality indicates improvement, but the rise in neonatal mortality in 2024 must be highlighted as an inconsistent result and indicates the continued need to strengthen follow-up services for newborns. The WHO states that neonatal mortality is closely linked to the quality of services during childbirth and the first week of life, and that improving the quality and financing of maternal and infant services from pregnancy through the postnatal period is a key strategy for preventing deaths that are actually preventable (Albarqi, 2025).

The findings of this study also make it clear that cross-sectoral integration is key. The document highlights a strong need to coordinate village administrations, Religious Affairs Offices, community health centers, and digital programs such as *Elsimil* to ensure that beneficiaries do not receive fragmented services. Recent literature also emphasizes that preconception services will be more effective if integrated into routine care, supported by interoperable record-keeping, clear performance indicators, and a division of roles among service providers that avoids overlap (Lassi et al., 2021).

The findings of this study have several important implications for clinical practice, policy, program development, and future research. In terms of clinical practice, midwives and other health professionals at community health centers should be supported through regular capacity-building training, particularly in conducting client-centered counseling, comprehensive risk assessment, and clear communication of examination results to preconception couples. The quality of interaction between health workers and clients must be improved to move beyond formality-driven service provision toward meaningful behavioral change support. Psychologists or counselors should be integrated more consistently into the preconception service team, given the identified gap in mental health screening capacity. From a policy perspective, the findings indicate an urgent need for the health ministry and regional health authorities to develop and implement standardized national guidelines and SOPs for preconception care applicable across all community health centers, so that service quality does not vary by facility. The government should also consider expanding BPJS health insurance coverage to include preconception health screenings, thereby removing financial barriers that currently prevent equitable access. For program development, the results suggest that the *Elsimil* and *Kescatin* digital platforms should be scaled up with improved user support, data interoperability, and integration into the service workflow at community health centers and Religious Affairs Offices. Cross-sectoral coordination mechanisms between these institutions should be formalized, with clear roles, shared performance indicators, and regular joint monitoring and evaluation cycles. Service scheduling should be adapted to accommodate working-age prospective couples, for example by providing evening or weekend services or community outreach activities. Finally, for future research, studies are needed to evaluate the long-term impact of preconception care on maternal and neonatal outcomes in Indonesian settings, to assess the effectiveness of specific intervention components such as digital platforms or group-based education, and to explore demand-side strategies for increasing voluntary and engaged participation among prospective couples.

4. CONCLUSION

Preconception health services in this study have been supported by the availability of basic programs and services; however, their implementation has not been optimal due to remaining barriers to target population participation, variations in service quality, inconsistent operational guidelines, and weak monitoring and data integration. Improvements in the coverage of several maternal and neonatal indicators suggest enhanced access to and utilization of services; however, their impact on maternal and infant health outcomes remains inconsistent. There is a need to strengthen service standardization through the development and implementation of uniform SOPs, improved counseling quality, and enhanced program monitoring and evaluation. Additionally, cross-sectoral integration among community health centers, Religious Affairs Offices, and relevant stakeholders must be strengthened to ensure preconception services are more coordinated, easily accessible, and sustainable.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

The first author Silvia Ari Agustina conceived and designed the study, collected and analyzed the data, interpreted the findings, and drafted the manuscript. Liberty Barokah contributed to the study design, research instruments, critically reviewed the analysis and interpretation of the findings, and revised the manuscript. Nining Tunggal Sri Sunarti contributed to the analysis and interpretation of the study results, revised the manuscript, and provided scientific input throughout the study. All authors read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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DECLARATION OF ARTIFICIAL INTELLIGENCE USE

Generative artificial intelligence (AI) was used solely to improve the language, grammar, readability, and organization of the manuscript. All scientific content, study design, data collection, data analysis, interpretation of the findings, and final manuscript preparation were performed by the authors. The authors take full responsibility for the accuracy, originality, and integrity of the manuscript.

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