

EFFECT OF AN ANTENATAL ONLINE SUPPORT GROUP PROGRAM IN IMPROVING THE PSYCHOLOGICAL RESILIENCE OF PREGNANT WOMEN IN THE WORKING AREA OF MARACANG PRIMARY HEALTH CARE, PURWAKARTA REGENCY

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ABSTRACT

Pregnancy is a period vulnerable to psychological distress, while access to structured psychosocial support at the primary health care level remains limited. This study aimed to analyze the effect of a WhatsApp Group-based Antenatal Online Support Group program on the psychological resilience of pregnant women in the working area of Maracang Primary Health Care, Purwakarta Regency. A quasi-experimental pretest-posttest with control group design was conducted among 36 second- to third-trimester pregnant women, with 18 participants in each group. The intervention group received the program for four weeks, with three sessions per week through a WhatsApp Group, while the control group received routine antenatal care. Psychological resilience was measured using the 10-item Connor-Davidson Resilience Scale (CD-RISC-10). Data were analyzed using the Paired Sample t-Test and Independent Sample t-Test. The intervention group showed a significant increase in resilience scores from 24.83 (SD 6.52) to 29.78 (SD 9.84) ($t(17) = 2.917$; $p = 0.010$; $d = 0.688$), whereas the control group showed no significant change ($p = 0.529$). Post-test and delta scores were significantly higher in the intervention group than in the control group ($p = 0.022$; $d = 0.798$ and $p = 0.007$; $d = 0.981$, respectively). The WhatsApp Group-based Antenatal Online Support Group program was associated with greater improvement in psychological resilience than routine antenatal care and may complement counseling in antenatal services. Larger randomized studies with longer follow-up are needed to confirm these findings.

Keywords: *Psychological resilience, pregnant women, antenatal online support group, WhatsApp group, maternal mental health.*

INTRODUCTION

Over about 40 weeks, pregnancy brings a series of hormonal, physical, and psychological shifts. Beyond accommodating fetal growth, expectant mothers must manage various psychological pressures, for example fear for their own safety and the baby's, anxiety about the coming delivery, and the demands of taking on new social roles. Using Self-Reporting Questionnaire-20 data from the 2018 national basic health research (Riskesdas), an earlier analysis estimated that 12.6% of 8,889 pregnant Indonesian women had common mental disorders (Ariasih et al., 2024). A cross-sectional study of 108 pregnant women in rural Magelang and Kebumen, Central Java, reported a still higher figure, with 63% showing depressive symptoms (PHQ-9 score ≥ 5) (Perwitasari et

al., 2023); estimates nevertheless differ depending on instrument, cut-off, and sampling method.

Psychological resilience, meaning a person's capacity to rebound and adapt constructively in the face of hardship, is one protective factor that helps women cope with these pressures (Hendriani, 2018). It is not a fixed trait. Resources such as social support and close family relationships can strengthen it, and women with higher resilience during the perinatal period tend to experience fewer mental health disorders (Hajure et al., 2024).

Support delivered in groups has proven beneficial for pregnant women. A cluster randomized controlled trial in 32 primary health centers in Ethiopia showed that structured antenatal group psychoeducation led to clearly better postnatal social support than was seen in a control group (Tessema et al., 2025). In primary care, however, limited time, long distances, and thin health workforce capacity make it hard to run regular face-to-face psychosocial support beyond the counseling already provided at antenatal visits under the national 10T standard (Kementerian Kesehatan RI, 2021). In Indonesia, WhatsApp Groups are a fitting option because WhatsApp is the most popular social platform, used monthly by roughly nine in ten social media users (DataReportal, 2025). In contrast to face-to-face psychosocial support, a WhatsApp Group demands neither a new application nor additional trips to the health center, allows women to participate from home and review the content later, and lets one midwife reach many pregnant women at once. Prior work has considered childbirth counseling through WhatsApp Groups as a means of lowering anxiety among primigravida (Sunarmi et al., 2022), has linked WhatsApp Group-based pregnancy education to better maternal knowledge (Wahyuni et al., 2022), and, in a recent systematic review of 21 studies, found that WhatsApp-based education in pregnancy benefited maternal knowledge, health behaviors, and psychological outcomes including anxiety and depression (Djouma Nembot et al., 2026).

Still, whether online interventions can specifically build psychological resilience in pregnant women has not been settled. One non-randomized pilot tested a 28-week supported online intervention (exercises, group sessions, and a peer support platform) and found no significant difference in resilience scores between groups (Van Haeken et al., 2024), an intervention that rested on earlier systematic development using the Behaviour Change Wheel framework (Van Haeken et al., 2023). A separate pilot randomized trial of an online cognitive behavioral program for pregnant women and their partners was meant to gauge feasibility and acceptability, leaving its effectiveness for larger trials to determine (Canfield et al., 2023).

Most prior online interventions for pregnant women have focused on knowledge, health behaviors, or anxiety and depression (Djouma Nembot et al., 2026; Sunarmi et al., 2022; Wahyuni et al., 2022), or else have packaged multiple components across a long period (Van Haeken et al., 2024). The program examined here differs in several respects. It is structured and facilitated by a midwife, runs entirely through a WhatsApp Group for four weeks (three sessions per week), and builds its content explicitly around resilience skills (cognitive reframing, problem-solving discussion, and goal-setting), with the aim of complementing the counseling part of routine antenatal care at a primary health center.

Indonesia's Ministry of Health recommends that pregnant women undergo mental health screening twice during pregnancy (at the first and fifth antenatal visits, in the first and third trimesters) and once postpartum (at the third postnatal visit, 8-28 days after delivery), with screening and follow-up of results available at primary health centers (Kementerian Kesehatan RI, 2024). Yet screening only flags women who are at risk. At Maracang Primary Health Care, Purwakarta Regency, women identified as at risk currently have no continuing psychosocial support and education mechanism outside the center's operating hours. The researchers' preliminary study reflected this: of 10 pregnant women briefly interviewed at Maracang Primary Health Care, 6 felt anxious, lonely, and confused about giving birth, and they linked these feelings to the lack of continuous psychological education outside the center's examination hours. This small preliminary sample cannot be generalized, but it signals a gap between case finding (screening) and follow-up care. An Antenatal Online Support Group program is therefore needed that is purpose-built to strengthen the psychological resilience of pregnant women through adaptive digital emotional support from pregnancy into the transition to childbirth, and Maracang Primary Health Care was chosen as the study site for that reason.

Given this gap in scientific evidence and the need to extend psychosocial support past routine antenatal visits at the primary care level, the present study investigates how effective a WhatsApp Group-based Antenatal Online Support Group program is for the psychological resilience of pregnant women in the working area of Maracang Primary Health Care, Purwakarta Regency (Dinas Kesehatan Kabupaten Purwakarta, 2025). Its objectives are: (1) to identify resilience scores before the program; (2) to identify resilience scores after the program; (3) to analyze the difference in scores between the intervention and control groups; and (4) to provide a basis for developing a maternal health service innovation at the primary health care level that is applicable and easy to replicate.

RESEARCH METHOD

The study followed a quasi-experimental pretest-posttest design with a control group. Psychological resilience scores were compared before and after the intervention between women who joined the Antenatal Online Support Group program (intervention group) and women who received routine antenatal care only (control group). The Health Research Ethics Committee of Universitas Muhammadiyah Purwokerto approved the study under registration number KEPK/UMP/158/VII/2026, dated 31 July 2026.

Setting, Population, and Sample

Fieldwork was carried out in the working area of Maracang Primary Health Care, Babakancikao Sub-district, Purwakarta Regency. The population was every second- to third-trimester pregnant woman who attended antenatal care at Maracang Primary Health Care while the study was running. To be included, women had to be at least 14 weeks pregnant, use WhatsApp actively and independently, and agree to take part by signing informed consent. Women were excluded if they had an active history of moderate-to-

severe psychiatric disorder under treatment, severe pregnancy complications requiring hospitalization, or were currently in another structured psychological support program. Consecutive sampling was used, starting from a target of 60 respondents (30 intervention, 30 control) based on established sample-size guidance for social research (Sekaran, 2003). Complete, correctly matched pre-post data existed for 36 respondents (18 intervention, 18 control); in other words, 36 of the 60 targeted respondents (60%) yielded usable data. Respondents whose records were incomplete or could not be matched were dropped from the analysis because of data-matching constraints encountered in the field. Demographic data were incomplete, so analyzed and excluded respondents could not be compared on their characteristics; the sole available comparability check was baseline resilience, which showed no difference between the two analyzed groups ($t(34) = 0.530$; $p = 0.599$). The 40% loss of targeted respondents thus remains a possible source of attrition/selection bias that cannot be ruled out, since it is unknown whether excluded respondents differed systematically from analyzed ones in characteristics other than baseline resilience.

Instrument and Intervention

Resilience was measured with the Indonesian version of the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) (Campbell-Sills & Stein, 2007), which is a brief version of the original 25-item scale (Connor & Davidson, 2003). Among pregnant women, the Indonesian CD-RISC-10 has shown good validity and reliability (item correlations 0.711-0.906; Cronbach's $\alpha = 0.940$; $n = 30$) (Perwitasari & Wulandari, 2024), matching the good internal consistency found in the original validation (Cronbach's $\alpha = 0.85$; Campbell-Sills & Stein, 2007). Both groups completed the instrument online at baseline (pre-test) and again at the end of week 4 (post-test). Total scores range from 0 to 40, and resilience is categorized as low (0-13), moderate (14-27), or high (28-40). Over four weeks, the intervention group received the Antenatal Online Support Group program in a WhatsApp Group three times a week (Monday: a 5-7 minute educational video and digital leaflet; Wednesday: an interactive quiz/game plus a scheduled question-and-answer session from 19.00-20.00 WIB; Friday: relaxation audio and a self-reflection journal), including cognitive reframing practice in week 2, problem-solving discussion in week 3, and simple goal-setting in week 4. The control group went on receiving routine antenatal care under the national 10T standard (Kementerian Kesehatan RI, 2021) and saw none of the program materials; for fairness, it was entitled to a summary of the materials once the study ended (waiting-list).

Data Analysis

The data were first analyzed univariately to describe resilience scores and their distribution, and the Shapiro-Wilk normality test was then applied because each group had fewer than 50 respondents. As every variable proved normally distributed, the Paired Sample t-Test was used for within-group pre-post differences, while the Independent Sample t-Test was used for between-group differences (baseline, post-test, and delta

scores), with Welch's correction wherever Levene's test pointed to unequal variances. The significance threshold was $p < 0.05$, and Cohen's d expressed effect size. Every comparison is presented with its t statistic, degrees of freedom (df), p -value, and Cohen's d . Informed consent was signed by all respondents, confidentiality was kept by coding respondents, and the control group retained its right to standard antenatal care services.

RESULTS AND DISCUSSION

Characteristics of the Study Data

Complete and correctly matched pre-test and post-test pairs were available for 36 respondents (18 intervention, 18 control). That total falls short of the proposal's target sample ($n = 60$; 30 intervention and 30 control), a consequence of data-matching constraints encountered in the field.

Description of Psychological Resilience Scores

Table 1 lays out descriptive statistics for the total CD-RISC-10 score (theoretical range 0-40) in both groups, before and after the program.

Table 1. Description of Psychological Resilience Scores Before and After the Program

Group	Time	n	Mean	SD	Median	Min	Max
Intervention	Pre-test	18	24.83	6.52	26.00	14	35
Intervention	Post-test	18	29.78	9.84	32.50	7	40
Control	Pre-test	18	23.72	6.05	23.00	9	35
Control	Post-test	18	23.28	5.99	24.50	10	35

Table 2 presents how respondents were distributed across resilience categories (low 0-13; moderate 14-27; high 28-40) in each group. In descriptive terms, the intervention group's share in the high-resilience category grew from 22.2% (pre-test) to 61.1% (post-test), while category proportions in the control group barely moved.

Table 2. Distribution of Psychological Resilience Categories

Group	Time	Low n (%)	Moderate n (%)	High n (%)
Intervention	Pre-test	1 (5.6)	13 (72.2)	4 (22.2)
Intervention	Post-test	1 (5.6)	6 (33.3)	11 (61.1)
Control	Pre-test	1 (5.6)	15 (83.3)	2 (11.1)
Control	Post-test	1 (5.6)	15 (83.3)	2 (11.1)

Normality Test

The Shapiro-Wilk normality test was run on pre-test, post-test, and delta (post minus pre) scores for each group before hypothesis testing, since each group had fewer than 50 respondents. Table 3 shows that all data in both groups were normally distributed ($p > 0.05$), so parametric tests were used

Table 3. Shapiro-Wilk Normality Test Results

Group	Variable	W Statistic	p-value	Conclusion
Intervention	Pre-test	0.932	0.210	Normal
Intervention	Post-test	0.899	0.054	Normal
Intervention	Delta (Post-Pre)	0.938	0.271	Normal
Control	Pre-test	0.950	0.433	Normal
Control	Post-test	0.973	0.851	Normal
Control	Delta (Post-Pre)	0.953	0.472	Normal

Within-Group Pre-Post Comparison

Table 4 reports the paired comparison of pre-test and post-test scores in the intervention and control groups (Paired Sample t-Test).

Table 4. Paired Sample t-Test Results for Pre-Post Resilience Scores

Group	Mean Pre	Mean Post	Mean Difference (SD)	t	df	p-value	Cohen's d
Intervention	24.83	29.78	4.94 (7.19)	2.917	17	0.010*	0.688
Control	23.72	23.28	-0.44 (2.94)	-0.642	17	0.529	-0.151

* statistically significant at $p < 0.05$.

According to the Paired Sample t-Test, resilience scores in the intervention group rose significantly from pre-test to post-test ($t(17) = 2.917$; $p = 0.010$; $d = 0.688$), an effect size considered moderate to large. The control group, in contrast, showed no significant pre-post difference ($t(17) = -0.642$; $p = 0.529$; $d = -0.151$).

Between-Group Comparison: Intervention versus Control

At baseline, the Independent Sample t-Test showed no significant difference in pre-test scores between the intervention and control groups ($t(34) = 0.530$; $p = 0.599$; $d = 0.18$), which means the groups were comparable at the start. Table 5 summarizes the unpaired comparison of post-test and delta scores between the groups.

Table 5. Independent Sample t-Test Results Between Groups

Comparison	Mean Intervention	Mean Control	Levene p	t (df)	p-value	Cohen's d
Post-test score	29.78	23.28	0.054	2.395 (34)	0.022*	0.798
Delta (Post-Pre)	4.94	-0.44	0.001	2.944 (22.53)	0.007*	0.981

* statistically significant at $p < 0.05$.

Levene's test checked homogeneity of variance. Variances for the delta comparison were not homogeneous ($p = 0.001$), so the Independent Sample t-Test was adjusted with Welch's correction. Variances for the post-test comparison were homogeneous ($p = 0.054$), giving $df = 34$ ($n_1 + n_2 - 2$); the delta comparison had a Welch-adjusted df of 22.53.

After four weeks of the program, the intervention group's post-test resilience score (29.78) was significantly higher than the control group's (23.28) ($t(34) = 2.395$; $p = 0.022$; Cohen's $d = 0.798$, a large effect). The gain (delta) in resilience was also significantly bigger in the intervention group (+4.94) than in the control group (-0.44) ($t(22.53) = 2.944$; $p = 0.007$; Cohen's $d = 0.981$, a large effect). The null hypothesis (H_0) was thus rejected. Taking part in the Antenatal Online Support Group program was accordingly associated with a stronger gain in psychological resilience than routine antenatal care. Because of the quasi-experimental design and small sample, however, these results call for cautious interpretation and cannot by themselves establish causality.

Discussion

The key finding is that joining the WhatsApp Group-based Antenatal Online Support Group program was associated with improved psychological resilience among pregnant women in the working area of Maracang Primary Health Care. This is shown by a significant pre-post gain in the intervention group ($d = 0.688$), together with significantly higher post-test scores and a greater magnitude of change (delta) than in the control group ($d = 0.798-0.981$). Given the large effect size of the between-group delta comparison, the shift in the intervention group is unlikely to be mere chance and may be connected to the program, but the non-randomized design and small sample do not permit firm causal conclusions. Furthermore, at baseline just 22.2% of the intervention group and 11.1% of the control group fell into the high-resilience category (Table 2), which points to a need for additional psychosocial support here.

The result is in line with evidence that structured group-based support can build up the psychosocial resources of pregnant women; for instance, face-to-face antenatal group psychoeducation improved postnatal social support in a cluster randomized trial of 550 pregnant women in Ethiopia (Tessema et al., 2025). This study carries that evidence over to an intervention run wholly through a WhatsApp Group, which fits with reports that WhatsApp-based interventions in pregnancy can improve maternal knowledge (Wahyuni et al., 2022) and psychological outcomes such as anxiety and depression (Djouma Nembot et al., 2026; Sunarmi et al., 2022). One feature that may set this study apart from one-way education alone is that the content targeted resilience dimensions directly -- cognitive reframing, scenario-based problem-solving practice, and simple goal-setting, each placed in a different week.

A non-randomized pilot study that reported no significant between-group difference in resilience (Van Haeken et al., 2024) is a useful point of comparison. Both studies were quasi-experimental and used a care-as-usual comparison group, yet they diverge in how the intervention was designed, how long it lasted, and who took part. Van Haeken et al. examined a 28-week supported online intervention that combined resilience exercises, group sessions, and a peer support platform and was built on the Behaviour Change Wheel framework (Van Haeken et al., 2023); it enrolled 70 intervention and 32 control participants who were followed until 12 months after childbirth. The present program, by comparison, lasted four weeks, ran only through a WhatsApp Group (three sessions per

week), and was tested in 36 second- to third-trimester pregnant women in Indonesia, with the post-test at the end of week 4. In the earlier study, resilience held steady in the intervention group but dropped significantly in the control group (Van Haeken et al., 2024); in this study, by contrast, resilience went up in the intervention group and did not change in the control group. The contrast between groups may stem from the shorter but more intensively scheduled program here (three sessions per week), content aimed at the dimensions measured by the CD-RISC, and the familiarity of WhatsApp among pregnant women in Indonesia. These are only hypotheses, since engagement and dose received were not directly compared. The present findings, on the other hand, are closer to a recent randomized controlled trial in which virtual group counseling based on health literacy significantly raised the empowerment and self-care of pregnant women relative to a control group (Rezaee et al., 2026), and to a systematic review that judged psychological interventions adapted for digital or hybrid delivery to be promising for maternal emotional well-being during crises such as the COVID-19 pandemic (Soultanopoulos et al., 2026). Confirming these findings for resilience as an outcome will require larger randomized trials with longer follow-up.

That the control group did not change significantly supports reading the intervention group's improvement as more than a maturation or testing effect; in a non-randomized design, though, other explanations including selection bias, unmeasured group differences, regression to the mean, and self-report bias remain possible. The study has several limitations. First, the analyzed sample ($n = 36$) was smaller than the proposal's target ($n = 60$), which weakened statistical power relative to the original plan even though the results still reached statistical significance; in addition, since the characteristics of analyzed and excluded respondents could not be compared, attrition or selection bias cannot be excluded. Second, the lack of full randomization in the quasi-experimental design may allow selection bias, despite the baseline equivalence test showing no significant difference between groups at the start. Third, follow-up stopped at week 4, so whether the program's effect lasts over the medium to long term could not be assessed. Fourth, incomplete demographic data prevented analysis of how respondent characteristics (age, parity, education, family support) relate to resilience scores. Fifth, the internal consistency of the CD-RISC-10 was not re-estimated in this sample and rests on earlier evidence from pregnant women.

What is new here is the use of a structured, midwife-facilitated WhatsApp Group program built specifically to develop psychological resilience during pregnancy, as opposed to just delivering information. Content aimed at resilience dimensions -- cognitive reframing, scenario-based problem-solving practice, and simple goal-setting spread over different weeks -- may be one reason these results differ from those of one-way education alone. A recent scoping review supports this distinction, noting that programs for higher-risk pregnant women are being designed more and more to build emotional resilience and coping skills instead of depending only on knowledge-focused psychoeducation (Nguyen & Pengpid, 2025).

In practical terms, the results back the idea that the Antenatal Online Support Group program could supplement the counseling component of the national 10T standard of care while sparing women extra face-to-face visits, and might be adopted as an integrated antenatal care innovation in primary health centers, particularly in areas with limited mental health workforce. A systematic review points the same way: it reported that combining non-specialist health workers such as midwives with digital technology can help narrow the mental healthcare gap and improve psychosocial functioning in resource-limited primary care settings, although the certainty of the supporting evidence was rated as low (Mudiyanselage et al., 2024).

CONCLUSION

Compared with routine antenatal care, the four-week WhatsApp Group-based Antenatal Online Support Group program was linked to a bigger improvement in the psychological resilience of pregnant women in the working area of Maracang Primary Health Care, Purwakarta Regency. CD-RISC-10 scores rose significantly in the intervention group ($t(17) = 2.917$; $p = 0.010$; $d = 0.688$), and post-test and delta scores were significantly higher than in the control group ($p = 0.022$ and $p = 0.007$; $d = 0.798$ - 0.981), whereas the control group, which had only routine antenatal care, did not change significantly. The program could complement the counseling component of standard antenatal care at primary health centers without increasing face-to-face visit burden. Because of the quasi-experimental design and small sample ($n = 36$), interpretation should be cautious, and future research should replicate the work in larger randomized trials with a longer follow-up period.

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