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PREGNANCY READINESS FOLLOWING WEB-BASED PRECONCEPTION EDUCATION AMONG PROSPECTIVE BRIDES

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ABSTRACT

Assessing reproductive and pregnancy preparedness among potential brides is crucial for mitigating pregnancy-related risks and enhancing mother and newborn health. This study sought to evaluate alterations in reproductive and pregnancy preparedness subsequent to the implementation of a web-based preconception education program. A quasi-experimental one-group pretest-posttest study was performed using 40 potential brides selected by purposive sampling at the Sidoarjo District Office of Religious Affairs. Participants utilized the web application for a duration of 14 days. Data were gathered utilizing a validated 45-item questionnaire exhibiting exceptional internal consistency (Cronbach's alpha=0.994) and analyzed employing the Wilcoxon signed-rank test. The median readiness score rose from 98.0 (range: 82–157) at pretest to 183.5 (range: 97–209) at posttest, while the mean score climbed from 107.33±24.27 to 173.25±31.49. A notable disparity was seen between the pretest and posttest scores ($Z=-5.181$; $p<0.001$), accompanied by a substantial effect size ($r=0.82$). The 14-day utilization of the web-based preconception education program correlated with enhanced reproductive and pregnancy preparedness. The program may function as an ancillary teaching resource in premarital services; nevertheless, controlled research are necessary to determine its efficacy.

Keywords: prospective brides; preconception education; pregnancy readiness; reproductive readiness; web application

INTRODUCTION

Preconception health serves as a crucial foundation for maternal and child health, since biological, nutritional, psychological, and behavioral factors prior to conception can impact pregnancy and its results. The preconception phase allows for the identification and modification of risk factors prior to pregnancy, such as inadequate nutritional status, anemia, harmful lifestyle choices, chronic illnesses, psychiatric issues, and insufficient pregnancy planning. Nonetheless, the recognition and implementation of healthy preconception practices among individuals of reproductive age remain variable. A systematic evaluation indicated that understanding of preconception health was frequently inadequate and that awareness did not consistently lead to behavioral modification (Welshman et al., 2023).

Reproductive and pregnancy preparedness is multifaceted and encompasses more than just awareness of pregnancy. It encompasses physical and nutritional readiness, psychological preparedness, healthy behaviors, pregnancy planning, and access to proper healthcare. For potential brides, these measurements are especially significant as the premarital phase may coincide with the onset of pregnancy. Proper preparation during this time may empower women to identify reproductive concerns, make informed choices, and pursue suitable care prior to conception. Consequently, premarital services serve as a crucial avenue for enhancing preconception information and facilitating better pregnancy planning.

In Indonesia, preconception care for potential brides includes several institutions and healthcare specialists. Nonetheless, implementation continues to be inconsistent. A qualitative study in primary healthcare facilities in Jakarta revealed various

challenges in providing preconception care, such as disparities in service implementation, restricted professional capacity, and the necessity for enhanced collaboration among healthcare providers and other entities involved in premarital services (Sibarani et al., 2025). The findings suggest that preconception care necessitates educational initiatives that enhance face-to-face counseling and offer prospective brides ongoing access to trustworthy information.

Digital technology provides a means to enhance preconception education beyond a solitary counseling session. Web-based education offers self-directed access to learning resources, enabling users to review knowledge depending on their specific requirements. Multimedia content, such as films and interactive quizzes, may promote more active information processing compared to passive reading alone. However, accessibility by itself does not ensure participation. Women in the preconception phase anticipate that digital health services will be evidence-based, credible, user-friendly, pertinent to their situations, and congruent with their everyday routines (Walker et al., 2022a). Thus, a digital preconception program must integrate accessibility with trustworthy content and user-focused educational elements.

The current research about digital preconception therapies is encouraging yet equivocal. A systematic assessment of digital and blended interventions addressing weight, food, physical activity, and supplementation indicated possible enhancements in several maternal health behaviors. Significant diversity was observed in intervention components, outcome measures, and participant involvement (O'Connor et al., 2024). A comprehensive assessment of mobile applications aimed at preconception behavior modification revealed a restricted number of qualifying research studies and determined that the overall certainty of evidence was poor (Musgrave et al., 2023). A recent assessment of web-based therapies indicated prospective benefits for specific outcomes, such as physical activity, blood pressure, and serum folate levels, although it revealed no consistent enhancements across numerous behavioral, psychological, and clinical outcomes (Suzuki et al., 2025). These findings underscore the necessity for context-specific research employing precisely delineated interventions and outcome metrics.

Prior research in Indonesia has often investigated premarital counseling or health education media by assessing knowledge and attitudes. Premarital education has been linked to enhancements in the knowledge and health attitudes of potential brides (Amizuar et al., 2024). Digital premarital screening has been employed to ascertain preconception hazards in potential brides, encompassing factors such as age, body mass index, hemoglobin levels, mid-upper arm circumference, and smoking habits (Nadya Dina Tazkiyah et al., 2024). Nonetheless, screening reveals current hazards but does not conclusively indicate if digital education enhances overall preparedness for reproduction and pregnancy. Evidence is still scarce concerning web-based programs that evaluate readiness as a multifaceted result rather than only knowledge.

The research gap in this study pertains to the insufficient evidence about web-based preconception education for potential brides in the context of the Office of Religious Affairs. Earlier research has predominantly concentrated on counseling, knowledge, attitudes, screening outcomes, or particular lifestyle behaviors. Limited research has assessed alterations in reproductive and pregnancy preparedness across physical, psychological, health behavior, and pregnancy planning dimensions. Moreover, the inconclusive results of prior digital health research suggest that the advantages of a web application must be assessed within its target demographic and service context, rather than presumed based on the merits of digital technology.

This study's originality is in assessing a pre-existing web-based preconception education program for prospective brides within a premarital service context. The program integrates teaching modules, videos, interactive quizzes, and online consulting capabilities. This study analyzes multimodal reproductive and pregnancy preparation, in contrast to studies that solely score knowledge or satisfaction. The Office of Religious Affairs context is essential as it engages women throughout the period just before marriage and prospective pregnancy.

This study sought to assess reproductive and pregnancy preparedness scores prior to and following 14 days of program access. This study employed a one-group, non-randomized pretest-posttest design to assess within-participant change and provide preliminary data, rather than to determine a causal effect.

METHOD

This study utilized a quasi-experimental one-group pretest–posttest design to evaluate reproductive and pregnancy preparation scores prior to and during the intervention. The research encompassed 40 prospective brides at the Sidoarjo District Office of Religious Affairs (KUA), East Java, Indonesia. Participants were chosen using purposive selection according to established inclusion and exclusion criteria. This study lacked a control group and random allocation, leading to the interpretation of the findings as within-participant changes rather than clear causal effects of the intervention.

Prior to the intervention, individuals undertook a pretest assessing their reproductive and pregnancy preparedness. They were granted access to an established web-based preconception education tool for a duration of 14 days. The application included educational resources on preconception health, reproductive preparedness, and pregnancy planning, supplemented by instructional videos, interactive quizzes, and an online consultation option. Upon conclusion of the intervention session, individuals administered the identical questionnaire as a posttest.

Reproductive and pregnancy readiness was assessed using a 45-item questionnaire developed by researchers, encompassing five domains: physical readiness (13 items), psychological readiness (7 items), health behavior readiness (10 items), pregnancy planning readiness (10 items), and economic preparation (5 items). Each question was evaluated using a 5-point Likert scale, spanning from strongly disagree to strongly agree. Positive comments received scores ranging from 1 to 5, while negative statements—specifically items 1, 4, 7, 8, 10, 12, 14, 16, 17, and 19—were graded in reverse from 5 to 1. The potential total score varied from 45 to 225, with increased scores signifying enhanced readiness. Scores were categorized as low readiness or unprepared (45–105), moderate readiness or moderately prepared (106–165), and high readiness or prepared (166–225).

The questionnaire underwent pilot testing with 15 respondents prior to data collection. The item-total correlation coefficients varied from 0.800 to 0.934, exceeding the critical value of 0.514; hence, all 45 items were deemed genuine. The total Cronbach's alpha coefficient was 0.994, and the coefficients for the five domains varied from 0.934 to 0.978, demonstrating exceptional internal consistency. Consequently, the questionnaire was deemed valid and reliable for assessing reproductive and pregnancy preparedness among potential brides.

Data were analyzed utilizing IBM SPSS Statistics version 27. Frequencies and percentages described participant characteristics and readiness categories, whereas means, standard deviations, medians, minimum values, and maximum values summarized readiness ratings. The Shapiro–Wilk test was employed to evaluate the normality of the pretest and posttest scores. Due to the non-normal distribution of the data, the disparities between the paired pretest and posttest scores were examined utilizing the Wilcoxon signed-rank test. The threshold for statistical significance was established at $p<0.05$. The extent of change was assessed using effect size r obtained from the Wilcoxon Z statistic. The impact size was 0.82, signifying a substantial amount of change.

The study obtained ethical permission from the Research Ethics Committee, identified by approval number 105.3/10/IV/EC/KEP/UNIK/2026, effective from April 10, 2026, until April 10, 2027. All participants were given a comprehensive explanation of the study and supplied informed consent prior to participation. Participant identities and research data were maintained in confidentiality throughout the study.

RESULTS

The study comprised 40 prospective brides at the Sidoarjo District Office of Religious Affairs. The majority of participants were aged 21–30 years (34; 85.0%), possessed higher education

qualifications (24; 60.0%), were employed (37; 92.5%), and earned over the district minimum wage (33; 82.5%), as detailed in Table 1.

Table 1 Overview of Respondent Characteristics (n-40)

Characteristics of responden	N	%
Age		
< 20 Years	6	15
>21-30 years	34	85
Education		
(Middle School, High School)	16	40
Intermediate	24	60
Work		
Work	37	92.5
Not working	3	7.5
Work		
<Minimum Wage	3	7.4
Minimum Wage	4	10
>Minimum Wage	33	82.5
Total	40	100

Prior to the intervention, 28 individuals (70.0%) were categorized as unprepared, while 12 (30.0%) were deemed moderately prepared; none were rated as prepared. Post-intervention, the count of individuals deemed unprepared fell to 3 (7.5%), whereas 10 people (25.0%) were classified as fairly prepared and 27 (67.5%) were categorized as prepared (Table 2).

Table 2. Reproductive Readiness and Pregnancy Readiness Before and After the Intervention

Readiness Category	Pretest		Posttest	
	Frequency (F)	Percentage (%)	Frequency (F)	Percentage (%)
Not yet prepared	28	70	3	7.5
Moderately prepared	12	30	10	25
prepared	0	0	27	67.5
Jumlah	40	100	40	100

The Shapiro–Wilk test revealed that both the pretest and posttest scores had non-normal distribution, with significance values below 0.001. Consequently, the disparities between the paired measurements were evaluated utilizing the Wilcoxon signed-rank test (Table 3).

Table 3. Normality Test Results

Variabel	Shapiro-Wilk	df	Sig.
Pretest	0.567	40	<0.001
Posttest	0.648	40	<0.001

Reproductive and pregnancy preparedness ratings improved following the 14-day intervention. The median score rose from 98.0 (range: 82–157) at pretest to 183.5 (range: 97–209) at posttest. The average score rose from 107.33±24.27 to 173.25±31.49. The Wilcoxon signed-rank test revealed a statistically significant difference between the pretest and posttest scores ($Z=-5.181$; $p<0.001$). The effect size was considerable ($r=0.82$), signifying a significant degree of within-participant variation (Table 4).

Table 4. Wilcoxon Signed Rank Test Results for Reproductive and Pregnancy Readiness of Prospective Brides

Variabel	Median (Min–Maks)	Mean ± SD	Z	p-value
Pretest	98.0 (82–157)	107.33 ± 24.27	-5.181	<0.001
Posttest	183.5 (97–209)	173.25 ± 31.49		

DISCUSSION

This study's primary finding was a significant enhancement in reproductive and pregnancy preparedness following prospective brides' engagement with the web-based preconception education program for 14 days. The median score rose from 98.0 to 183.5, and the mean score ascended from 107.33 to 173.25. The percentage of participants deemed prepared rose from 0% at pretest to 67.5% at posttest. The Wilcoxon signed-rank test revealed a significant difference between the two measurements ($Z=-5.181$; $p<0.001$), accompanied by a substantial effect size ($r=0.82$). Nonetheless, given this study employed a one-group pretest–posttest design, the results should be regarded as significant within-participant enhancement linked to the intervention rather than conclusive proof of a causative relationship.

The significant score improvement may be partially attributed to the participants' very low initial preparedness. Prior to the session, 70% of participants were deemed unprepared, indicating significant potential for enhancement. The

educational content was directly connected with the domains of the questionnaire, encompassing physical readiness, psychological readiness, health behavior, pregnancy planning, and economic preparation. This alignment may have enhanced participants' awareness and comprehension of the behaviors and preparations necessary prior to conception. Nonetheless, employing the identical questionnaire for both pretest and posttest may have resulted in a testing effect due to participants' prior exposure to the questionnaire items.

The results align with studies indicating that organized preconception education enhances the knowledge and attitudes of potential brides for safe pregnancy preparation. Amizuar et al. (2024) documented enhancements in the knowledge and health perspectives of prospective brides subsequent to premarital education(Amizuar et al., 2024). Qurniasih et al. (2024) similarly discovered that reproductive health education enhanced prospective brides' comprehension of preconception health. This study expands upon previous findings by assessing a web-based training program and examining multidimensional aspects of reproductive and pregnancy preparedness, rather than concentrating solely on knowledge or attitudes(Qurniasih Nila et al., 2024).

Various attributes of the intervention may credibly elucidate the noted enhancement. Self-paced access permitted participants to study at their convenience, while repeated access over the 14-day period facilitated the review of knowledge that was not fully comprehended following initial exposure. Educational movies facilitated learning by delivering knowledge via visual and aural modalities, while interactive quizzes prompted participants to retrieve and utilize the material. A systematic review and meta-analysis indicated that video-based methods in health education enhance knowledge acquisition and attitudes, however the extent of the impact differs according on the educational context and intervention design (Morgado et al., 2024).

The application's accessibility and adaptability were pertinent to the requirements of potential brides. Walker et al. (2022) discovered that women in the preconception phase anticipated digital health resources to be evidence-based, credible, pertinent, easily accessible, and congruent with their everyday routines(Walker et al., 2022). Participants favored concise and customized information over an excessive quantity of general health data. The integration of educational resources, videos, quizzes, and online consultations in the current application likely offers a more immersive learning experience compared to singular information dissemination(Faridah et al., 2024; Fibrila et al., 2024).

The interactive features may have facilitated cognitive reinforcement. Participants actively engaged with the subject by taking quizzes and conducting repeated reviews, rather than merely receiving knowledge passively. Nonetheless, the individual impact of each program feature could not be assessed independently. Furthermore, automated data concerning the quantity of log-ins, duration of access, module completion, and quiz attempts was not accessible. Consequently, it is unclear if participants who utilized the tool more frequently exhibited bigger enhancements in preparedness scores.

The current findings should be evaluated in conjunction with the inconclusive evidence pertaining to digital preconception therapies. Musgrave et al. (2023) evaluated merely seven qualifying research and determined that the certainty of evidence for mobile applications for preconception behavior modification was poor. The therapies and outcomes varied significantly, and no definitive conclusions could be established on their efficacy(Musgrave et al., 2023). O'Connor et al. (2024) similarly identified significant heterogeneity in digital and mixed preconception therapies focused on food, physical activity, body weight, and supplement utilization. These data suggest that favorable results from a single application should not be extrapolated to all digital preconception therapies (O'Connor et al., 2024).

Recent systematic reviews also indicate mixed results. Suzuki et al. (2025) discovered that web-based therapies could enhance certain outcomes, including as physical activity, serum folate levels, and systolic blood pressure, nevertheless they did not consistently boost various other behavioral, psychological, metabolic, or pregnancy-related

outcomes(Suzuki et al., 2025). Conversely, Nurleli et al. (2025) indicated that digital health interventions may enhance preconception knowledge, self-efficacy, and specific health behaviors. The disparities may pertain to intervention content, length, target demographic, involvement level, and outcome assessment. Consequently, the significant short-term enhancement shown in the present study advocates for more assessment of this particular program, however it does not confirm the efficacy of web-based education for all preconception outcomes(Nadya Dina Tazkiyah et al., 2024; Nurleli et al., 2025; Yulivantina E &Syamsyaih R, 2021).

The KUA setting offers a significant practical opportunity since it engages women during the critical period just before marriage and potential motherhood. The application may enhance instruction provided by midwives and other healthcare professionals by offering ongoing access beyond scheduled premarital counseling. Nonetheless, it should not supplant expert evaluation and counseling. Digital education must be linked to suitable healthcare recommendations for participants exhibiting anemia, inadequate nutritional status, reproductive health symptoms, psychiatric issues, chronic illnesses, or other preconception dangers.

This research possesses multiple limitations. The lack of a control group implies that the observed enhancement cannot be distinguished from testing effects, exposure to additional information, familial talks, or temporal changes. Secondly, purposive sampling, the limited sample of 40 individuals, and recruitment from a single KUA constrain the generalizability of the findings. The 14-day follow-up period was inadequate to ascertain if the improvement was maintained or converted into actual health behaviors. Fourth, the absence of automated engagement data hindered a comprehensive evaluation of intervention fidelity and the correlation between application usage and preparedness enhancement. The exceptionally high Cronbach's alpha coefficient of 0.994 suggests considerable similarity among certain questionnaire items. Subsequent research should investigate item redundancy, construct validity at the domain level, and the responsiveness of instruments.

Subsequent investigations should utilize a controlled or randomized methodology, encompass bigger samples from other KUA locations, and incorporate extended follow-up durations. Subsequent research should additionally include objective engagement metrics, including access frequency, length, completed modules, and quiz performance. Outcomes must encompass not just self-reported readiness but also quantifiable preconception behaviors, such as folic acid intake, anemia control, dietary enhancement, preconception health assessments, and pregnancy planning.

CONCLUSION

The 14-day utilization of a web-based preconception education program resulted in a substantial enhancement in reproductive and pregnancy preparedness among potential brides. This enhancement was evidenced by elevations in median and mean scores, alterations in readiness classifications, and a substantial impact size. The program can function as an auxiliary instructional resource in premarital services by offering flexible and repeated access to preconception material.

The absence of a control group, the brief follow-up duration, and the deficiency of objective application-usage data constrain causal interpretation. Consequently, the results ought to be regarded as preliminary. Multisite controlled studies with larger sample sizes, extended follow-up periods, objective engagement metrics, and behavioral or therapeutic outcomes are necessary prior to endorsing broader implementation.

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