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## REDUCING ADELESCENT MENTAL HEALTH DISORDERS THROUGH DIGITAL INTERVENTION: THE EFFECTIVENESS OF THE FOAM WEBSITE (A QUASI-EXPERIMENTAL STUDY)

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### ABSTRACT

**Background:** Adolescent mental health problems such as depression, anxiety, and stress are increasing and may affect quality of life. Digital-based interventions are needed to improve accessibility and reduce stigma. This study aimed to analyze the effectiveness of the *FOAM* (Forum and Motivational Articles) *website* in reducing mental health disorders among adolescents.

**Methods:** This study used a quantitative pre-experimental design with a one-group pretest-posttest approach. The sample consisted of 42 adolescents aged 17–22 years selected using purposive sampling. Data were collected using the DASS-21 questionnaire and analyzed using the Wilcoxon signed-rank test.

**Results:** The results showed a significant decrease in depression, anxiety, and stress levels after the intervention ( $p=0.000$ ). Before the intervention, most respondents were in the moderate to severe categories, whereas after the intervention, they shifted to the mild and normal categories.

**Conclusion:** The *FOAM website* is effective as a digital intervention in reducing mental health disorders among adolescents and can be used as an alternative mental health promotion strategy.

**Keywords:** adolescents, digital intervention, mental health, website

### INTRODUCTION

Mental health is defined as a state of well-being wherein individuals recognize their potential and can navigate life's stressors through emotional regulation and a positive self-concept (Suryana et al., 2022). The adolescent period, marked by significant physical, mental, and psychological transitions, is particularly vulnerable to emotional instability (Daryaswanti et al., 2024). Failure to manage these developmental challenges effectively can lead to severe mental health issues (Yunalia et al., 2022).

Global and national data highlight a concerning trend in adolescent mental health. According to the World Health Organization (2025), 15–20% of late adolescents experience mental health disorders, with anxiety and depression being the most prevalent. In Indonesia, specifically in the Polokarto District of Sukoharjo, the situation is acute; 65% of late adolescents report moderate to high anxiety regarding their professional future and social relationships, yet only 8% seek professional counseling due to geographical and financial barriers (Dinas Kesehatan Kabupaten Sukoharjo, 2024). While social media usage among youth presents both opportunities for connection and risks such as cyberbullying and addiction, technology can be repurposed for constructive support (Elina et al., 2024). Given that youth often prefer digital channels for seeking help due to the stigma surrounding traditional clinical settings (Ihsanuddin et al., 2025). Online counseling and information platforms offer a flexible, private, and effective alternative (Daulay, 2025).

The increasing prevalence of mental health problems among adolescents requires innovative intervention strategies that are accessible, affordable, and acceptable to young people (Yunalia et al., 2022). Digital mental health interventions have emerged as effective alternatives to conventional face-to-face services because they overcome geographical barriers, reduce stigma associated with seeking psychological help, and provide flexible access regardless of time and location. Adolescents are particularly receptive to digital approaches because they are highly engaged with internet-based communication and information technologies (Ihsanuddin et al., 2025).

This study classified individuals aged 17–22 years as late adolescents (Nur & Dewi, 2021). Although some international frameworks categorize individuals older than 19 years as young adults, several developmental psychology theories recognize adolescence as a transitional period extending into the early twenties due to ongoing psychosocial, emotional, and cognitive development (Suryana et al., 2022). In Indonesia, individuals aged 17–22 years frequently remain engaged in educational activities and continue experiencing developmental challenges associated with adolescence; therefore, this age range was considered appropriate for the study objectives (Suryana et al., 2022).

The FOAM (Forum and Motivational Articles) website was developed as a digital mental health intervention integrating two complementary components: evidence-based motivational articles designed to enhance psychological resilience, self-awareness, coping skills, and positive thinking; and an interactive discussion forum that allows participants to share experiences, provide peer support, and discuss emotional challenges in a moderated online environment (Hadiansyah et al., 2025). This combination was designed to address both cognitive and social aspects of mental health promotion (Skaarnes et al., 2024).

Previous studies have demonstrated the effectiveness of digital interventions in reducing symptoms of depression, anxiety, and stress among adolescents and young adults (Indahyanti, 2022). Rachmadyanshah & Khairunisa, (2021) reported that social media-based and web-based interventions can improve mental health outcomes and increase engagement among young populations. Similarly, Salsabila et al., (2022) found that digital self-healing interventions significantly reduced anxiety symptoms and enhanced psychological resilience among adolescents. Furthermore, Gala et al., (2023) demonstrated that website-based counseling platforms are feasible, acceptable, and beneficial for improving psychological well-being among university students (Masriyudin, Ahmad Fauzi, 2024). Therefore, the FOAM website was selected as a potentially effective intervention that combines mental health education and peer interaction within a single digital platform (Kruzan et al., 2022; Rangkuti & Hulu, 2026).

The FOAM (Forum and Motivational Articles) website was selected as a digital mental health intervention because it provides an accessible, cost-effective, and adolescent-friendly platform that integrates psychoeducational content and peer-support interaction, enabling users to improve mental health literacy, develop adaptive coping strategies, enhance emotional resilience, and reduce symptoms of depression, anxiety, and stress, while previous studies have demonstrated that web-based mental health interventions are effective in improving psychological well-being and increasing engagement among adolescents and young adults (Gala et al., 2023; Ihsanuddin et al., 2025; Rachmadyanshah & Khairunisa, 2021).

## RESEARCH METHOD

This study employed a quantitative pre-experimental design using a one-group pretest–posttest approach to evaluate the effectiveness of the FOAM (Forum and Motivational Articles) website in reducing depression, anxiety, and stress among

adolescents. This design was selected as a preliminary evaluation of a newly developed digital mental health intervention in a community setting, allowing comparison of participants' mental health conditions before and after the intervention. However, the absence of a control group may introduce threats to internal validity, including maturation, history, and testing effects; therefore, all participants received the intervention during the same four-week period and completed standardized assessments using identical procedures. The study was conducted in Tepisari Village, Polokarto District, Sukoharjo Regency, Indonesia, involving a population of 75 unmarried adolescents aged 17–22 years (Choiriah et al., 2025). This age range was classified as late adolescence because psychosocial and emotional development often continues into the early twenties, particularly among individuals who are still engaged in educational and transitional life stages.

A total of 42 participants were selected through purposive sampling based on specific eligibility criteria relevant to the study objectives. The sample size was determined using Slovin's formula with a 10% margin of error, yielding a minimum requirement of 42 participants. The inclusion criteria were unmarried adolescents aged 17–22 years residing in Tepisari Village, able to read and understand Indonesian, possessing a smartphone and internet access, with a PSS-10 score greater than 14 indicating moderate-to-high perceived stress, and willing to participate by providing informed consent. The exclusion criteria included adolescents who were currently receiving psychological counseling or psychiatric treatment, had a previously diagnosed severe mental disorder, participated in another mental health intervention during the study period, failed to complete the four-week intervention program, or did not complete either the pretest or posttest assessment. Yuni Kurniawaty, (2023) The Perceived Stress Scale (PSS-10) was used as an initial screening instrument to identify adolescents experiencing moderate-to-high perceived stress, while the Depression Anxiety Stress Scale (DASS-21) was used to assess depression, anxiety, and stress levels before and after the intervention. Both instruments have demonstrated good validity and reliability in Indonesian populations, with Cronbach's alpha coefficients exceeding 0.70 for the PSS-10 and ranging from 0.82 to 0.93 for the DASS-21 (Hakim & Aristawati, 2023). Both instruments, the PSS-10 and DASS-21, are measured using a Likert scale (Hakim & Aristawati, 2023).

The intervention was delivered through the FOAM website over four weeks and consisted of evidence-based motivational articles covering mental health awareness, stress management, emotional regulation, resilience, and coping strategies, as well as a moderated discussion forum that facilitated peer support, experience sharing, and discussion of emotional challenges. Participants were encouraged to access the website at least once weekly for approximately 15–30 minutes, and adherence was monitored through website activity logs and WhatsApp reminders. The research procedure began with participant recruitment and informed consent, followed by PSS-10 screening, a DASS-21 pretest, orientation to the FOAM website, implementation of the four-week intervention, monitoring of participant engagement, and administration of the DASS-21 posttest one week after intervention completion. The primary outcomes were changes in depression, anxiety, and stress scores measured using the DASS-21. The study has obtained health research ethics approval with No.3125/UKH.L02/EC/I/2026. Data were analyzed using descriptive statistics and the Wilcoxon Signed-Rank Test with a significance level of  $p < 0.05$ .

## RESULTS

The following analysis presents the research findings in the form of distributions of respondent characteristics and respondents' mental health conditions, which are divided into three categories: anxiety, stress, and depression.

Table 1. Characteristics of Respondents (n = 42)

| Characteristics                 | Frequency (f) | Percentage (%) |
|---------------------------------|---------------|----------------|
| Gender                          |               |                |
| Female                          | 30            | 71.4           |
| Male                            | 12            | 28.6           |
| Age                             |               |                |
| 12–16 years (Early Adolescence) | 0             | 0.0            |
| 17–22 years (Late Adolescence)  | 42            | 100.0          |
| Occupation                      |               |                |
| Student                         | 19            | 45.2           |
| University Student              | 8             | 19.0           |
| Employee                        | 12            | 28.6           |
| Others                          | 3             | 7.1            |
| Total                           | 42            | 100.0          |

Source: Primary Data Processed, 2026

The majority of respondents were female, accounting for 30 participants (71.4%), while male respondents comprised 12 participants (28.6%). All respondents were aged 17–22 years and were categorized as late adolescents (100%). By occupation, most respondents were students (19 participants, 45.2%), followed by employees (12 participants, 28.6%), university students (8 participants, 19.0%), and other occupations (3 participants, 7.1%).

Table 2. Depression Levels Among Adolescents in Tepisari Village Before and After the FOAM Website Intervention

| Depression Level | Pretest (%) | Posttest (%) |
|------------------|-------------|--------------|
| Normal           | 1 (2.4)     | 13 (31.0)    |
| Mild             | 1 (2.4)     | 10 (23.8)    |
| Moderate         | 20 (47.6)   | 17 (40.5)    |
| Severe           | 17 (40.5)   | 2 (4.8)      |
| Extremely Severe | 3 (7.1)     | 0 (0.0)      |
| Total            | 42 (100.0)  | 42 (100.0)   |

Source: Primary Data Processed, 2026

Before the intervention, most respondents were categorized as having moderate depression (47.6%) and severe depression (40.5%). After the intervention, the proportion of respondents in the normal and mild categories increased substantially to 31.0% and 23.8%, respectively. Meanwhile, severe and extremely severe depression decreased markedly.

Table 3. Anxiety Levels Among Adolescents in Tepasari Village Before and After the FOAM Website Intervention

| Anxiety Level    | Pretest (%) | Posttest (%) |
|------------------|-------------|--------------|
| Normal           | 0 (0.0)     | 4 (9.5)      |
| Mild             | 0 (0.0)     | 4 (9.5)      |
| Moderate         | 1 (2.4)     | 25 (59.5)    |
| Severe           | 18 (42.9)   | 8 (19.0)     |
| Extremely Severe | 23 (54.8)   | 1 (2.4)      |
| Total            | 42 (100.0)  | 42 (100.0)   |

Source: Primary Data Processed, 2026

The pretest findings showed that most respondents experienced extremely severe anxiety (54.8%) and severe anxiety (42.9%). Following the intervention, anxiety levels improved considerably, as indicated by the increase in normal, mild, and moderate categories. Furthermore, the proportion of respondents with extremely severe anxiety declined sharply from 54.8% to 2.4%.

Table 4. Stress Levels Among Adolescents in Tepasari Village Before and After the FOAM Website Intervention

| Stress Level     | Pretest (%) | Posttest (%) |
|------------------|-------------|--------------|
| Normal           | 2 (4.8)     | 27 (64.3)    |
| Mild             | 5 (11.9)    | 9 (21.4)     |
| Moderate         | 24 (57.1)   | 4 (9.5)      |
| Severe           | 11 (26.2)   | 2 (4.8)      |
| Extremely Severe | 0 (0.0)     | 0 (0.0)      |
| Total            | 42 (100.0)  | 42 (100.0)   |

Source: Primary Data Processed, 2026

Before the intervention, most respondents experienced moderate stress (57.1%), followed by severe stress (26.2%). After the intervention, the majority of respondents were categorized as normal (64.3%), while moderate and severe stress levels decreased substantially. These findings indicate that the FOAM (Forum and Motivational Articles) website intervention contributed to improved stress conditions among adolescents.

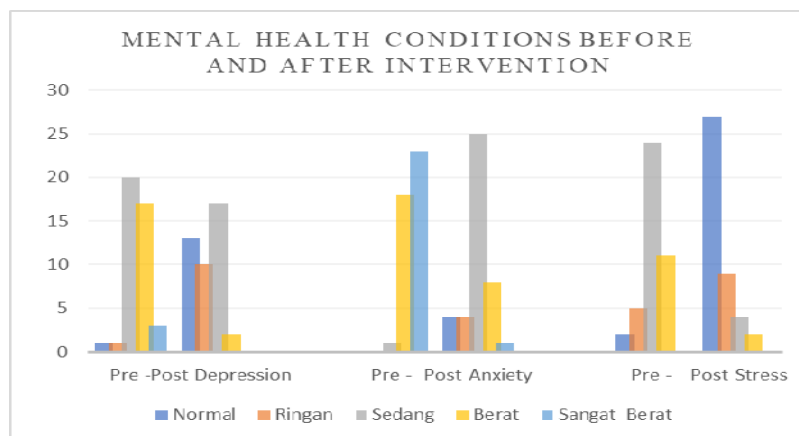


Figure 1. Mental Health Status Before and After the Intervention  
Source: Personal data, processed (2026)

The accompanying diagram clearly shows a consistent shift from higher-severity categories (severe and very severe) to lower-severity categories (moderate, mild, and normal) across all three variables. This visual representation reinforces the statistical findings, demonstrating the effectiveness of the FOAM website intervention in improving adolescents' mental health outcomes.

Table 5. Bivariate Analysis of the Effectiveness of the FOAM Website (Forum and Motivational Articles) in Reducing Mental Health Disorders Using the Wilcoxon Signed-Rank Test

| Variable | Pretest–Posttest<br>Depression | Pretest–Posttest<br>Anxiety | Pretest–Posttest<br>Stress |
|----------|--------------------------------|-----------------------------|----------------------------|
| Z-value  | -5.320                         | -5.452                      | -5.212                     |
| p-value  | 0.000                          | 0.000                       | 0.000                      |

Source: Primary Data Processed, 2026

Statistical analysis using the Wilcoxon test showed a p-value of 0.000, indicating a significant difference between pretest and posttest results.

## DISCUSSION

A total of 42 adolescents participated in this study. As presented in Table 1, the majority of respondents were female (71.4%), while males accounted for 28.6% of the sample. This finding is consistent with previous studies indicating that female adolescents tend to participate more actively in health-related programs and are generally more willing to discuss emotional and psychological issues. Furthermore, female adolescents have been reported to be more vulnerable to symptoms of depression, anxiety, and stress due to hormonal fluctuations, emotional sensitivity, and social pressures experienced during adolescence.

Regarding age, all respondents were between 17 and 22 years old and were therefore categorized as late adolescents (100%). This developmental stage is characterized by significant psychosocial transitions, including identity formation, educational demands, career planning, increasing independence, and social role adjustments. These challenges may increase susceptibility to mental health problems such as depression, anxiety, and stress, making late adolescents an important target population for preventive mental health interventions.

Based on occupation, most respondents were students (45.2%), followed by employees (28.6%), university students (19.0%), and individuals with other occupations (7.1%). The predominance of students in this study may partly explain the elevated levels of psychological distress observed at baseline, as academic demands, examination pressure, uncertainty regarding future educational or career opportunities, and social expectations are recognized risk factors for mental health problems among adolescents and young adults. Similarly, employed respondents may experience additional stress related to workload, financial responsibilities, and work-life balance during the transition to adulthood. These findings suggest that the study participants represented a population exposed to multiple psychosocial stressors, highlighting the importance of accessible and innovative mental health interventions such as the FOAM website.

The baseline assessment revealed that respondents experienced considerable mental health problems before the intervention. Regarding depression, most participants were classified as having moderate depression (47.6%), followed by severe depression (40.5%) and very severe depression (7.1%). Only a small proportion of respondents were categorized as normal or mild (2.4% each). These findings indicate that emotional distress was prevalent among participants prior to the intervention.

Anxiety emerged as the most severe mental health problem at baseline. More than half of the respondents (54.8%) were categorized as experiencing very severe anxiety, while 42.9% were classified as severe. Only one participant (2.4%) reported moderate anxiety, and none were categorized as normal or mild. This finding suggests that anxiety was the dominant psychological concern among adolescents in the study population. Similarly, stress levels were relatively high before the intervention. Most respondents were classified as experiencing moderate stress (57.1%), followed by severe stress (26.2%), mild stress (11.9%), and normal stress (4.8%). These findings indicate that adolescents in the study area were experiencing a substantial psychological burden that.

Following the four-week FOAM website intervention, notable improvements were observed in depression levels. The proportion of respondents categorized as normal increased from 2.4% to 31.0%, while the mild category increased from 2.4% to 23.8%. In contrast, severe depression decreased substantially from 40.5% to 4.8%, and no respondents remained in the very severe category after the intervention. These findings suggest that exposure to motivational articles and peer-support discussions contributed to improved emotional regulation, positive thinking, and adaptive coping strategies among participants. The educational content provided through the FOAM platform may have enhanced participants' understanding of mental health and promoted healthier responses to psychological challenges.

Substantial improvements were also observed in anxiety levels. Before the intervention, the majority of respondents experienced severe or very severe anxiety. After the intervention, the distribution shifted considerably, with most participants categorized as having moderate anxiety (59.5%). The proportion of respondents with severe anxiety decreased from 42.9% to 19.0%, while very severe anxiety declined dramatically from 54.8% to 2.4%. Furthermore, participants began to appear in the normal and mild categories (9.5% each), which were previously absent. These results suggest that the FOAM website successfully reduced anxiety symptoms by providing emotional support, stress management information, and opportunities for social interaction through the discussion forum. The peer-support component may have helped participants feel less isolated when facing emotional difficulties, thereby reducing anxiety levels.

The intervention also demonstrated positive effects on stress reduction. Following the intervention, the proportion of respondents classified as normal increased substantially from 4.8% to 64.3%, while the proportion classified as mild stress increased from 11.9% to 21.4%. Conversely, moderate stress decreased from 57.1% to 9.5%, and severe stress declined from 26.2% to 4.8%. These findings indicate that participants became more capable of managing stress and adapting to challenging situations after engaging with the FOAM platform. The motivational articles may have strengthened resilience and coping skills, while the discussion forum provided opportunities for emotional expression and social support, both of which are important protective factors against stress.

The effectiveness of the FOAM website was further confirmed through the Wilcoxon Signed-Rank Test. Statistical analysis revealed significant differences between pretest and posttest scores for depression, anxiety, and stress ( $p = 0.000$ ;  $p < 0.05$ ). These findings indicate that the FOAM intervention significantly improved adolescents' mental health outcomes. The intervention's effectiveness may be explained by the high level of digital engagement among contemporary adolescents. As digital natives, adolescents frequently utilize internet-based technologies for communication, information seeking, and social interaction. Consequently, web-based interventions are often perceived as more accessible, convenient, and acceptable than traditional face-to-face approaches.

The findings of this study are consistent with previous research on digital mental health interventions. A study in 2025 reported that a digital self-healing intervention significantly reduced anxiety symptoms and improved resilience among adolescents (Ihsanuddin & Kurniawan, 2025). The other study developed a website-based counseling platform that was found to be feasible, acceptable, and beneficial for improving psychological well-being among university students (Gala et al., 2023). Furthermore, Rachmadyanshah & Khairunisa, (2021) demonstrated that interactive web-based educational platforms effectively enhanced mental health knowledge among adolescents. The present study extends previous findings by demonstrating that the FOAM website not only provides psychoeducational content through motivational articles but also facilitates peer interaction through discussion forums, thereby combining educational and social support mechanisms within a single digital intervention.

This study has several limitations. First, the absence of a control group limits causal inference and increases the risk of internal validity threats, such as maturation, history, and testing effects. Second, the relatively small sample size and purposive sampling technique may limit the generalizability of the findings to broader adolescent populations. Third, the four-week intervention period may not adequately capture the long-term effects of the intervention on mental health outcomes. Future studies should employ randomized controlled trial designs with larger sample sizes and longer follow-up periods to strengthen the evidence regarding the effectiveness of digital mental health interventions.

Overall, the findings highlight the potential of the FOAM website as an innovative and scalable digital mental health intervention. Such platforms may be particularly valuable in rural or underserved areas where access to professional mental health services remains limited. Integrating digital mental health interventions into community-based health promotion programs could contribute significantly to improving adolescent psychological well-being and preventing mental health problems.

## **CONCLUSION**

The FOAM website was effective as an online-based intervention media for reducing mental health problems among adolescents.

## **RECOMMENDATIONS**

Digital interventions need to be integrated by the government and healthcare providers into mental health programs. Further development of similar platforms is also recommended to expand their reach and impact.

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