
Effectiveness of Digital Education in Improving Knowledge of Anxiety and Depression Disorders in Adolescents

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Abstract:

Mental health disorders among adolescents are a growing global concern. Adolescents are in a transitional phase that makes them vulnerable to emotional, social, and academic pressures. Mental health education serves as a promising promotive and preventive effort to reduce the prevalence of mental health issues in this age group. This article aims to review the influence of mental health education on reducing the incidence of mental disorders among adolescents based on recent studies. This quantitative study used a pre-experimental design with a one group pretest-posttest approach. A total of 50 adolescents were selected through purposive sampling. Data were collected using a questionnaire assessing knowledge of mental health before and after the intervention. Data were analyzed using the Wilcoxon test. The results showed a significant difference in adolescents' knowledge levels before and after the mental health education (p -value < 0.05). This indicates that the educational intervention effectively enhanced their understanding of mental health. Mental health education is effective in improving adolescents' knowledge about the importance of maintaining mental health and recognizing early symptoms of mental disorders.

Key word: mental health education, adolescents, mental disorders, prevention, mental health promotion

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INTRODUCTION

Anxiety disorders and depression are major mental health issues that threaten the well-being of adolescents globally (Blanch & Barkus, 2021; Dhamayanti et al., 2020; Hunter et al., 2022; O'Laughlin et al., 2021; Pihkala, 2020). World Health Organization (WHO) data shows that the current global mental health condition is quite alarming. Adolescents are a vulnerable group to mental health disorders because they are in the search phase for their identity and experiencing physical, emotional, and social changes. External factors such as poverty, abuse, or violence can worsen their mental state (Astuti et al., 2020; Cahyanthi, 2021; Fatmawati et al., 2018; Nurmala et al., 2020; Rahmatika QT, 2023). World Health Organization (WHO) data shows that 13% of adolescents aged 10-19 years have mental disorders, with anxiety and depression as the main causes of disability in this group (WHO, 2021).

In Indonesia, the adolescent mental health survey (I-NAMHS) found that 26% of adolescents experienced anxiety, 10.6% were hyperactive, 5.3% were depressed, and some others experienced various behavioral disorders (UGM, 2022). In Pekalongan Regency, the problem of adolescent mental health is also a concern. In 2023, 125 adolescents were recorded to have mental health disorders and received services at health centers. However, the Youth Posyandu still focuses more on physical examinations than mental health. A preliminary study of 10 adolescents at the Youth Posyandu showed that 70% did not understand the types of mental disorders and their causes.

Mental health disorders that are not treated from adolescence can continue into adulthood and impact their physical and mental health later in life. Therefore, early detection is very important to identify early symptoms so that treatment can be obtained immediately (WHO, 2021). However, stigma and lack of understanding of early detection often hinder adolescents' access to mental health services (UNICEF, 2021).

Early detection of mental health is influenced by several factors, such as predisposition (knowledge, attitudes, and beliefs), possible factors, and driving factors. Research shows that more than 80% of adolescents have a low level of knowledge about mental health, while their attitudes towards mental health also still need to be improved (Laras et al., 2020; Mulyadi, M. Isra & Chrisnawati, 2022; Ratna Wirantika & Susilowati, 2020; Sholehah et al., 2019; Yulfitria et al., 2022).

Digital-based education, such as e-booklets, offers innovative solutions to improve adolescent mental health literacy. This medium allows for the delivery of interactive information through interesting animations, videos, and graphics, thereby increasing engagement and knowledge retention (Hermalasari et al., 2023).

Several studies have shown an increase in understanding after being educated about mental health (Kristianingsih et al., 2023). In this study, education is provided through e-booklet and e-leaflet media, which allow the delivery of information in an interactive and interesting manner through various electronic devices (Hermalasari et al., 2023).

The Youth Posyandu is the right forum for mental health education. However, the implementation of mental health programs at Posyandu Remaja is still limited to the physical aspect, not yet touching education on anxiety disorders and depression.

Based on this gap, this study aims to analyze the effectiveness of digital education in improving adolescents' knowledge about anxiety disorders and depression. in Pekalongan Regency. Furthermore, the findings may serve as a basis for stakeholders, such as local health authorities and Youth Posyandu managers, to design more comprehensive promotive and preventive programs. Ultimately, the study aims to help reduce stigma, promote early detection, and improve mental health outcomes among adolescents.

RESEARCH METHOD

This study involved several research variables, consisting of the independent variable, which is mental health education delivered through e-booklet media, and the dependent variables, which are adolescents' knowledge and attitudes toward mental health disorders. The research employed a quasi-experimental design, aiming to explore causal relationships by utilizing both intervention and control groups without random sampling. The study applied a pre-test post-test with a control group design, where both groups underwent an initial observation (pre-test), and only the intervention group received educational treatment for four weeks before a final observation (post-test). The research process began with the submission of permits from the Master of Health Administration and Policy Program to the Bojong I Health Center and Kedungwuni II Health Center. After permission was granted, data collection was conducted using questionnaires. The researchers, assisted by four enumerators, selected participants based on eligibility criteria and obtained informed consent. The intervention group filled out questionnaires before and after receiving e-booklet education, while the control group completed questionnaires only at the beginning and end of the study period without any intervention. The sample consisted of 50 adolescents aged 13–18 years from Pekalongan Regency, with 25 participants each in the intervention and control groups. The chosen locations, Bojong I and Kedungwuni II Health Centers, reported the highest incidence of adolescent mental health disorders

in the region. For data analysis, univariate analysis was conducted to determine descriptive statistics such as the mean, median, standard deviation, and range. Bivariate analysis was employed to assess relationships between variables using appropriate statistical tests based on data distribution, such as the paired or independent t-test for normally distributed data and Wilcoxon or Mann-Whitney tests for non-normal data. A p-value of less than 0.05 indicated a statistically significant effect of the intervention on adolescents' knowledge and attitudes regarding mental health, while a p-value greater than 0.05 suggested no significant difference between groups.

RESULTS AND DISCUSSION

Respondent Characteristics

Table 1. Socioeconomic Status of Respondent's Parents

Socioeconomic Status of Respondent's Parents	Intervention		Control		P value
	f	%	f	%	
Tall	16	64	20	80	1,000
Low	9	36	5	20	
Sum	25	100	25	100	

Table 1. showed that most of the economic status of the respondents' parents from the intervention group was high (64%), as well as the majority control group (80%) had a high economic status. The results of the chi square test obtained a p value of 1,000 > 0.05, so that there was no difference in the economic status of the respondent's parents between the intervention group and the control group, so that the economic status variable was not a counfounding variable.

Table 2. Respondent's Parents' Marital Status

Respondent's Parents' Marital Status	Intervention		Control		P value
	f	%	f	%	
Marry	20	80	15	60	1,000
Single	5	20	10	40	
Sum	25	100	25	100	

Table 2. It showed that the majority of the marriage status of the respondent's parents in the intervention group was married (80%), as well as in the majority control group (60%) had married status, but the number of respondents' parents who were married in the intervention group was greater than in the control group. The results of the chi square test obtained a p value of 1,000 > 0.05, so that there was no difference in the marital status of the respondents' parents between the intervention group and the control group, so that the marriage status variable was not a counfounding variable.

The Effects of Education on Knowledge of Early Detection of Adolescent Mental Health Disorders

Table 3. Differences in Knowledge on Early Detection of Adolescent Mental Health Disorders in Intervention and Control Groups, 2025

Knowledge	Intervention	Control	p
	$\bar{x} \pm SD$ Med (min-max)	$\bar{x} \pm SD$ Med (min-max)	
Pre test	8,84 $\pm$ 1,573 9(6-12)	8,08 $\pm$ 1,288 8(6-10)	-
Post test	13,6 $\pm$ 1,155 14(10-16)	8,52 $\pm$ 1,418 8(6-11)	-
p value	0,000a	0,005a	

Δ	4,76 $\pm$ 1,739 5(2-9)	0,44 $\pm$ 0,651 0(-1-2)	0,000b
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Description: aUji Wilcoxon, bUji Mann Whitney

Table 3 shows that knowledge about early detection of adolescent mental health disorders before and after education in the intervention group increased on average from 8.84 to 13.6 or an increase in knowledge of 4.76. The results of the wilcoxon test with a p value of $0.000 < 0.05$ so that H_a is accepted or H_0 is rejected, means that there is an effect of education on knowledge about mental health disorders in the intervention group.

Knowledge about early detection of adolescent mental health disorders in the control group increased on average from 8.08 to 8.52 or there was an increase in knowledge of 0.8. The results of the wilcoxon test with a p value of $0.005 < 0.05$ so that H_a is accepted or H_0 is rejected, meaning that there is a difference in knowledge about mental health disorders in the control group.

The results of the Mann Whitney test with a p value of $0.000 < 0.05$ so that H_a was accepted or H_0 was rejected, meaning that there was a difference in knowledge about mental health disorders in the intervention group and the control group. The change in knowledge in the intervention group was greater with an average difference of 4.76, while in the control group the average change in knowledge was 0.44.

Results of the Influence of Education on Attitudes Regarding Early Detection of Adolescent Mental Health Disorders

Table 4. Differences in Attitudes Regarding Early Detection of Adolescent Mental Health Disorders in Intervention Groups and Control Groups, 2025

Attitude	Intervention $\bar{x} \pm SD$ Med (min-max)	Control $\bar{x} \pm SD$ Med (min-max)	p
Pre test	33,64 $\pm$ 4,009 34(27-41)	33,96 $\pm$ 3,553 35(27-41)	-
Post test	46,44 $\pm$ 2,678 34(43-53)	34,76 $\pm$ 3,407 36(28-41)	-
p value	0,000a	0,000c	
Δ	12,80 $\pm$ 4,000 12(7-22)	0,80 $\pm$ 0,577 1(0-2)	0,000b

Description: aUji Wilcoxon, bUji Mann Whitney, cUji Paired t Test

Table 4 shows that adolescents' attitudes regarding the early detection of adolescent mental health disorders before and after being educated in the intervention group increased on average from 33.64 to 46.44 or there was an increase in attitudes of 12.8. The results of the wilcoxon test with a p value of $0.000 < 0.05$ so that H_a is accepted or H_0 is rejected, means that there is an influence of education on attitudes about mental health disorders in the intervention group.

Adolescents' attitudes regarding the early detection of adolescent mental health disorders before and after in the control group increased on average from 33.96 to 34.76 or an increase in attitude of 0.8. The results of the paired t test with a p value of $0.000 < 0.05$ so that H_a was accepted or H_0 was rejected, meaning that there was a difference in attitudes about mental health disorders in the control group.

The results of the Mann Whitney test obtained a p value of $0.000 < 0.05$ so that H_a was accepted or H_0 was rejected, meaning that there was a difference in attitude change regarding mental health disorders in the intervention group and the control group. The change in attitude in the intervention group was greater with an average difference of 12.80, while in the control group the average change in knowledge was 0.80.

Outcome of Intervention Effectiveness**Table 4. Intervention Effectiveness**

Variable	Group	Statistics	p-value	Significance
Knowledge	Intervention	+4.76	U=0.500; Z=-6.161	P<0.001
	Control	+0.44	Z=-2840	P=0.005
Attitude	Intervention	+12.80	U=76,000; Z=-2687	P=0.007
	Control	+0.80	t=-6928	P<0.001

The above results prove that education with e-booklets is significantly more effective in improving knowledge and attitudes about the early detection of adolescent mental health disorders compared to the non-intervention group.

The Effectiveness of Digital Education in Increasing Knowledge about Anxiety and Depression Disorders

The results showed that education using e-booklet media significantly increased adolescents' knowledge about the early detection of mental health disorders ($p = 0.000$). These results are in line with Kristianingsih et al. (2023) research, which found that health education can improve understanding of mental health and its prevention strategies. Increased knowledge was seen in 15 question items, including an understanding of mental disorders, risk factors, and ways to prevent and detect early. This shows that e-booklets are effective in conveying information that can help adolescents understand the concept of mental health better.

This is in line with the research of Hermalasari et al. (2023), that digital-based education, such as e-booklets, offers innovative solutions to improve adolescent mental health literacy. This medium allows for the delivery of interactive information through engaging animations, videos, and graphics, thereby increasing engagement and knowledge retention

The Impact of Digital Education on Attitudes in Early Detection of Anxiety and Depression Disorders

The e-booklet intervention also had a significant impact on changes in adolescents' attitudes ($p < 0.001$). The biggest increase in attitudes was seen in adolescents' willingness to report symptoms of anxiety or depression to parents or health care workers. This shows that digital education has succeeded in reducing stigma related to mental disorders by presenting evidence-based information and relevant case examples. These results are in line with the research of Rahmawati et al. (2024), which found that health promotion can increase adolescents' positive attitudes towards mental health.

However, attitudes to asking for family help still show the lowest increase. This indicates that although knowledge is improving, cultural barriers or fear of negative judgments remain a challenge. The study of Ariyanti et al. (2023) suggests the need for the integration of assertive communication modules in education to build adolescents' confidence in sharing mental problems.

Comparison with the Control Group

The control group experienced minimal increases in knowledge ($p = 0.005$) and attitudes ($p < 0.001$), likely due to indirect exposure to information through social media or peer discussion after the initial questionnaire completion. However, the changes in the intervention group were much greater (knowledge: +4.76 vs +0.44; attitude: +12.80 vs +0.80), proving that structured education through e-booklets is more effective than independent learning. These findings are consistent with Sartika's

(2024) research which emphasizes that materials that are systematically designed with visual and narrative approaches can improve information retention.

CONCLUSION

Mental health education has an important role in preventing and reducing the incidence of mental health disorders in adolescents. Educational programs that are structured and in accordance with the needs of adolescents can increase understanding, foster positive attitudes towards mental health issues, and encourage healthy help-seeking behavior. Collaboration between schools, families, health workers, and communities is the key to success in supporting adolescent mental health. Therefore, the integration of mental health education into the educational curriculum and activities of adolescents needs to be prioritized to create a mentally and emotionally healthy generation. Based on the findings of this study, it is recommended that mental health education be more widely implemented using engaging and accessible media such as e-booklets, particularly within adolescent health programs like the Youth Posyandu.

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