

Enhancing bullying prevention among Indonesian adolescents through Digital Social–Emotional Skills Training (D-SEST): A quasi-experimental study

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Abstract

Background: Bullying among adolescents in schools has both short- and long-term negative consequences for victims as well as perpetrators. Documented impacts include anxiety, feelings of insecurity, reduced concentration, declining academic performance, and depression. Social–emotional approaches to bullying prevention have not been widely implemented among adolescents, despite the need for comprehensive intervention strategies.

Purpose: This study aims to examine the effect of Digital Social–Emotional Skills Training (D-SEST) on preventing bullying among adolescents in school settings.

Methods: This experimental study involved 106 adolescents identified as being at high risk of bullying perpetration. Participants were assigned to two equal groups: intervention and control ($n = 53$ each). Adolescents in the intervention group received information and training through the D-SEST program. Outcomes were measured by assessing bullying risk and helping behavior toward victims. The Wilcoxon signed-rank test and Mann–Whitney U test were used to analyze within-group and between-group differences.

Results: Adolescents who participated in D-SEST showed significant improvements in their ability to help bullying victims ($M_{pre} = 1.30$ vs. $M_{post} = 2.32$) and in bullying prevention skills ($M_{pre} = 1.64$ vs. $M_{post} = 2.91$), with $p < 0.001$.

Conclusion: Thus, this study contributes to the understanding of how digital-based social–emotional training influences adolescents' responses as helpers to bullying victims by enhancing empathy, sense of belonging, and social skills. These improvements may play an important role in preventing bullying behavior in school settings.

Keywords: bullying; social emotional skill training; digital; adolescent; schools

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Introduction

Bullying is highly pervasive in various countries, especially bullying in schools (Guy et al., 2019). Adolescents are at high risk of being involved in bullying cases, whether they are victims or perpetrators (Bowes et al., 2019) and bullying is a common experience among adolescents (Le et al., 2017). Bullying is synonymous with aggressive actions carried out on others with the aim of being hurt and repeatedly (Pontes et al., 2018). Bullying incidents involving adolescents often occur in the school environment, so it can disrupt social interactions between students and cause insecurity and discomfort in activities in the school environment, which is frequently overlooked (Jan, 2015; Kibriya et al., 2015).

Ignoring bullying cases can cause potential problems and disrupt the learning process and student interactions at school, bullies tend to avoid activities and not focus during learning activities (Cheng et al., 2010; Lefta et al., 2023). In addition, bullying has short-term and long-term impacts, where the long-term impact of bullying on victims is on aspects of quality

of life related to physical health conditions (Chen & Huang, 2015); has an impact on psychological health and well-being (Le et al., 2016; World Health Organization, 2022); and also disruptive cognitive processing in adolescence, low self-efficacy in particular (Liu et al., 2023). This situation shows that the negative impact of bullying is very detrimental to the adolescent group, it is important to provide special interventions by strengthening the adolescent's self-capacity to control bullying cases, especially in Indonesia.

Research conducted in 40 countries involving 202,056 school adolescents showed a prevalence of 12.6% as victims of bullying and 10.7% as perpetrators (Silva et al., 2019). World Health Organization (WHO) reported that the global incidence of bullying is estimated to reach one billion adolescents who experienced physical, sexual, or emotional violence or neglect in the past year, especially children aged 2-17 years (World Health Organization, 2022). The Global school-based student health survey (GSHS) revealed in 2015 that 32% of Indonesian students aged 13 to 17 years-old had experienced physical violence and 20% had been bullied in their school (Borualogo & Casas, 2022). The Indonesian National Commission for Child Protection revealed that there were 2.473 cases of bullying at school, from 2011 to 2019 (Indonesian Child Protection Commission, 2020). Bullying cases can increase drastically without proper intervention and collaboration for adolescents.

Various interventions for handling bullying in adolescents in schools are quite diverse. Some of these programs include the "Tutoría Entre Iguales" (TEI) program, a school program with a peer-tutoring approach that enhances a positive school climate through problem-solving programs to reduce and prevent cyberbullying (Ferrer-Cascales et al., 2019); The KiVa anti-bullying, KiVa derived from the Finnish word for "nice" and an acronym for "against bullying," this program trains teachers to teach children safe strategies for preventing bullying. The KiVa program are considered quite effective in preventing bullying through self-assessment tested with an ordered multinomial model and a binomial logistic regression model (Huitsing et al., 2020); and the Olweus bullying prevention program (OBPP) is a comprehensive bullying prevention program that involves students, staff, teachers, and parents or families in its interventions. This intervention focuses on encouraging pro-social behavior and building a sense of community. This Program significantly reduces the prevalence of bullying in German schools (Ossa et al., 2021). Based on previous research, many studies have focused on improving peer tutoring, the role of teachers in educating about bullying prevention, and comprehensive approaches involving parents. Meanwhile, previous research has shown that bullies tend to experience difficulties adjusting their social and emotional functioning, and this has not been implemented as an intervention approach (Fullchange & Furlong, 2016).

Social emotional learning (SEL) is a long-term educational model that can improve children's abilities and skills in managing emotions. This model was initiated with the aim of dynamically connecting schools, families and communities (Elias et al., 1997). SEL has so far only been intended for curriculum development in schools (Blewitt et al., 2018). The social emotional aspect is rarely revealed and developed as a main component in handling bullying cases; the impact of digital-based social emotional teaching needs to be proven. The digital approach to preventing bullying in adolescents is considered very suitable because it is in line with the developmental characteristics of adolescents as digital natives, digital as a current pattern of social interaction, and several interventions that are easily accessible. Empirical evidence regarding the effectiveness of digital-based social-emotional learning interventions as a bullying prevention strategy among adolescents in Indonesian schools is still limited. This study aims to determine the effect of digital social-emotional learning on preventing adolescent bullying in schools.

Materials and Methods

Design

This study employed a quasi-experimental design with a pre-post test control group to compare the effectiveness of the intervention before and after implementation. The treatment group received the Digital Social-Emotional Skills Training intervention delivered across four sessions, whereas the control group received standard bullying education typically provided by local health services.

Sample and setting

The participants were composed of adolescents who were still attending in public junior high schools in Lamongan (Indonesia) with total 326 adolescents. This study used a purposive sampling technique based on inclusion and exclusion criteria determined by the researcher. A total of 106 selected respondents were randomly divided into a control group and a treatment group with 53 adolescents, respectively (Figure 1). The inclusion criteria for this study were (1) adolescents aged 12-15 years; (2) adolescents who are currently undergoing formal education in junior high schools, (3) adolescents who are at risk of bullying in the last 3 months; (4) not physically or mentally ill or disabled, (5) can be communicated with properly and correctly. Meanwhile, the exclusion criteria in this study were adolescents who did not receive education at public junior high schools in Lamongan Regency, were on leave or study leave, and adolescents who refused to become research respondents.

Instruments

Age, gender, grade and place of residence were all collected using a self-designed questionnaire.

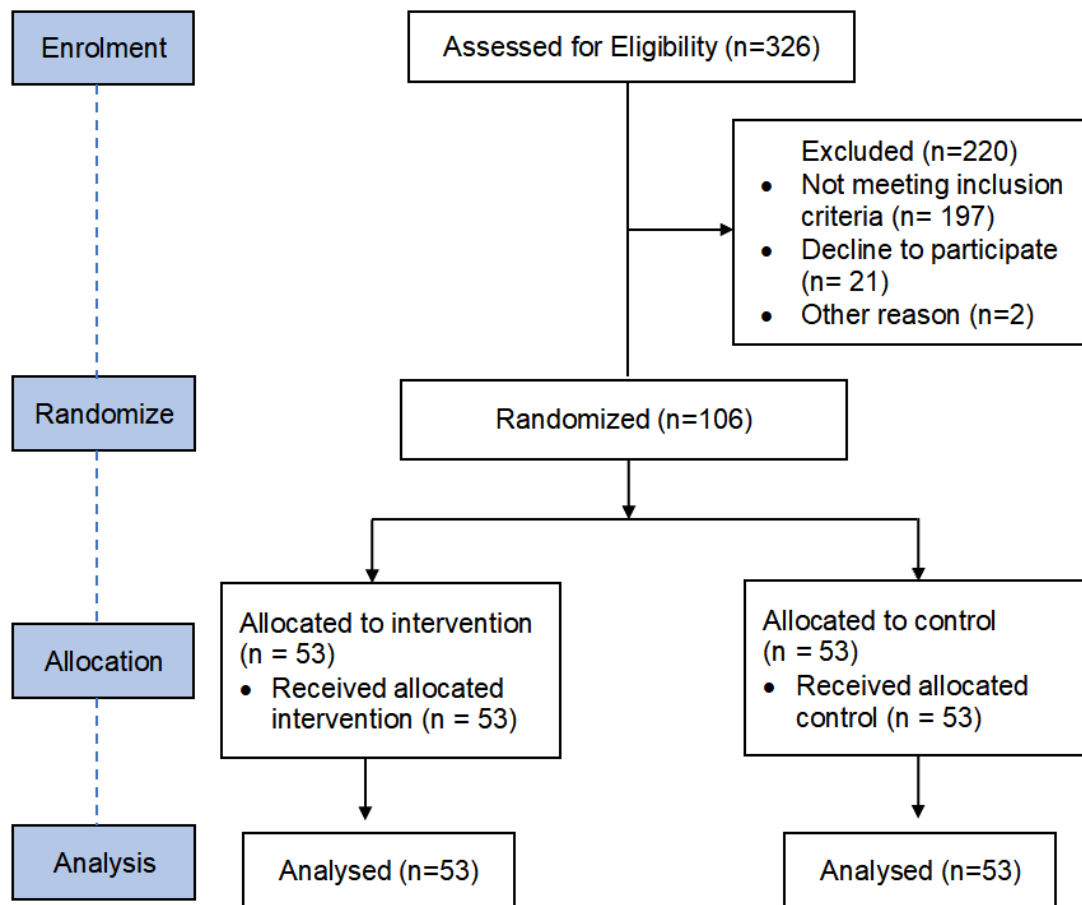


Figure 1. CONSORT 2010 Flow Diagram

Digital social emotional skill training

The intervention given to the treatment group was to provide digital-based social emotional training created and developed by researchers based on previous literature (Payton et al., 2000). Although formal psychometric validation was not conducted at this stage, expert observations and preliminary testing support the content validity and practical applicability of the program. This application called as Digital Social Emotional Skill Training (D-SEST). This social emotional skills training consists of several components, such as self-management, self-awareness and social-awareness, responsible decision-making and relationship skills. All of these components will be packaged in one application that can be accessed in real time by respondents with interesting features and the nature of exploring respondent information. Participants in the control group did not receive the digital social-emotional skills training. Instead, they were provided with standard information on bullying prevention through printed educational leaflets.

Bully Scale

The bully scale or bullying perpetrator was measured using a questionnaire from the English

version of the Questionnaire on School Bullying which consists of 17 questions (Figula et al., 2019). This questionnaire was adapted into Indonesian through forward translation, back-translation, and cultural adaptation within the research environment. The initial translation from English to Indonesian was carried out independently by a translator. The researcher then summarized the Indonesian version, which was then back-translated into English by another bilingual translator not involved in the initial translation process. It is explained that there are several question domains, including the physical aggression subscale (4 questions), verbal aggression subscale (5 questions), exclusion subscale (5 questions), and positive profit subscale (3 questions). Grading takes place according to the following scale: almost never (0), sometimes (1), often (2), almost always (3). The internal consistency of the factor was adequate Cronbach's alpha of 0.86.

Helper participant Scale

Helper participant scale or ability to help victims of bullying was measured using a questionnaire from the English version of the Questionnaire on School Bullying which consists of 8 questions (Figula et

Table 1. Session and Intervention of Digital Social Emotional Skill Training (D-SEST)

Session	Duration	Intervention
Session 1: Bullying Education	30 minutes	Explanation to adolescents about bullying and how to handle it. In this session, the researcher confirmed the results of the previous stage evaluation and made them aware that they were at risk of being bullies.
Session 2: Explanation and practice of self-management	30 minutes	Adolescents receive information and training on improving their ability to control various holistic elements within themselves such as physical, emotional, feelings, thoughts and behavior to achieve good and targeted things.
Session 3: Explanation and practice of Self Awareness	30 minutes	Adolescents receive information and training on how to improve their abilities in understanding awareness of thoughts, feelings, and self-evaluation. The goal is for teens to be able to know the strengths, weaknesses, drives, and values of themselves and others.
Session 4: Explanation and practice of Social Awareness	40 minutes	Adolescents receive information and training on how to raise awareness of issues faced by their society or community, especially while at school.
Session 5: Explanation and practice of Responsible Decision Making	40 minutes	Adolescents receive information and training on how to improve their ability to make appropriate decisions that do not harm others and consider the values and ethics that apply in the community.
Session 6: Explanation and practice of Relational Skill	40 minutes	Adolescents receive information and training on how to improve their communication, listening, cooperation, resistance to social pressure or bullying, negotiation of conflict constructively, and seeking and offering help when someone needs it.

al., 2019). This questionnaire was adapted into Indonesian through forward translation, back-translation, and cultural adaptation within the research environment. The initial translation from English to Indonesian was carried out independently by a translator. The researcher then summarized the Indonesian version, which was then back-translated into English by another bilingual translator not involved in the initial translation process. There are several question domains including reconciling interposition subscale (3 questions), interposition appealing for help subscale (2 questions) and Affective Subscale (inner tension in relation to the violence) (3 questions). Grading takes place according to the following scale: almost never (0), sometimes (1), often (2), almost always (3). The internal consistency of the factor was adequate Cronbach's alpha of 0.76.

Intervention

The treatment group received six offline sessions of digital social-emotional skills training, each lasting approximately 30 to 40 minutes. The meetings were held weekly, as follows The 1st meeting is training on bullying education and training on self-management, the 2nd meeting is training on self-awareness and social-awareness, the 3rd meeting is training on making the right decisions (responsible decision making) and relationship skills. Participants in the control group did not receive the digital social-emotional skills training. Instead, they were provided with standard information on bullying prevention

through printed educational leaflets.

Data collection

Before the study began, the researcher ensured that this study was declared ethical by the health research ethics commission. Adolescents who meet the inclusion and exclusion criteria and are willing to sign informed consent will be included as research respondents. The study began with initial data collection conducted on 326 respondents who were at risk of bullying, and then determined 106 respondents who had the highest scores. Furthermore, this data was validated by the school (teachers) related to subjective assessments of student behavior while at school.

The respondents received information about the definition, objectives, benefits, disadvantages and research procedures that would be carried out during the research, at the end respondents would fill out an informed consent. The intervention was carried out at one of the schools in Lamongan district which was considered strategic for providing education with large capacity. The Respondents will be divided into control and treatment groups with the same proportion. The control and treatment groups will fill out a bullying prevention skills questionnaire before and after (pre-post) the intervention is given.

Data analysis

This study used descriptive statistical tests to see the distribution of data, as well as to see the mean and standard deviation. The Mann-Whitney test was

conducted to analyze possible differences between groups before the intervention. Then, the main analysis was conducted to investigate the intragroup intervention effects between pre-test and post-test data collection, the Wilcoxon test was conducted with each group. The SPSS 16.0 software program was used to process the data.

Ethical consideration

This study has been reviewed and approved by the Health Ethics Committee of Muhammadiyah University of Lamongan (Approval Number 145/EC/KEPK-S4/07/2024). Adolescents who consent will provide an informed consent to participate and will obtain permission from their school, acting as institutional guardian, to conduct the study. Confidentiality and anonymity are guaranteed

throughout the study, and participants are allowed to withdraw at any time without penalty.

Results

Table 1 shows that the results of the analysis show that the majority are male groups and the majority are grade 8 respondents. Some of them also participate in extracurricular activities while at school and lives with their nuclear family.

The results of the Wilcoxon and Mann Whitney tests are shown in Tables 2 and 3 showing the impact of the intervention. In the experimental group, significant differences were found between before and after the intervention in the variables of bullying prevention ability and ability to help bullying victims. In both variables, the scores after the intervention

Table 1. Demographic Data

Characteristic	n	%
Gender		
Male	66	62.3
Female	40	37.7
Age		
12 years old	27	25.5
13 years old	40	37.7
14 years old	39	36.8
Grade		
7 Class	31	29.2
8 Class	53	50.0
9 Class	22	20.8
Lives with		
Nuclear Family	91	85.8
Aunt/Uncle	13	12.3
Grandma or Grandpa	2	1.9

Table 2. The Comparison of Effect of Intervention

		Control Group (n = 53)			Experimental Group (n = 53)		
		M (SD)	Z	p	M (SD)	Z	p
Bullying Prevention	Pre	1.32 (0.510)	- 1.732	0.083	1.64 (0.522)	- 6.413	0.000
	Post	1.38 (0.527)			2.91 (0.295)		
Helping Victims	Pre	1.21 (0.409)	- 2.000	0.046	1.30 (0.463)	- 6.474	0.000
	Post	1.28 (0.455)			2.32 (0.471)		

Table 3. The Differences between Group After the Intervention

	Control Group (n = 53) M (SD)	Experimental Group (n = 53) M (SD)	Z	p
Bullying Prevention	1.38 (0.527)	2.91 (0.295)	- 9.076	0.000
Helping Victims	1.28 (0.455)	2.32 (0.471)	- 7.828	0.000

were higher than before. Specifically, the mean score for bullying prevention in the experimental group was 2.91 (SD = 0.295), while in the control group it was 1.38 (SD = 0.527). The Mann–Whitney test indicated a significant difference between the two groups ($Z = -9.076$, $p = 0.000$), suggesting that the intervention effectively improved participants' ability to prevent bullying behavior. Similarly, for the helping victims variable, the experimental group obtained a higher mean score ($M = 2.32$, $SD = 0.471$) than the control group ($M = 1.28$, $SD = 0.455$), with a statistically significant difference ($Z = -7.828$, $p = 0.000$). These results indicate that the D-SEST intervention substantially enhanced adolescents' empathy and prosocial behavior, particularly their willingness and ability to support peers who experience bullying.

Discussion

The Digital Social Emotional Skills Training (D-SEST) intervention significantly impacted bullying prevention among adolescents after participants received the intervention according to the researchers' guidelines. The results showed an increase in the ability to help victims of bullying and a decreased risk of becoming perpetrators of bullying. This is supported by previous research that social skills are important in anti-bullying interventions and form the basis of cross-sector interventions, including peer mentoring and cooperative learning (Gregus et al., 2020; J. L. da Silva et al., 2018). Other research suggests that adolescents with high levels of empathy tend to be more active in defending victims of bullying, while those with low levels of empathy tend to reinforce bullying behavior or act as passive bystanders (Graf et al., 2019; Hikmat et al., 2024; Longobardi et al., 2020).

These findings highlight the impact of delivering a digitally packaged five-component social-emotional learning intervention. Programs that include social and emotional skills training, awareness campaigns, and learning approaches that promote tolerance and respect for diversity can potentially reduce the incidence of bullying in adolescents (Hikmat et al., 2024). Social skills, in this context, relate to students' empathy in recognizing and responding to the emotions of others during interactions, thereby reducing the likelihood of engaging in bullying behavior (Nasti et al., 2023). Other research confirms that programs that improve social skills can enhance positive peer relationships and can be implemented in school settings, such as fostering attachment, togetherness, and a sense of belonging (Suresh & Vijaya, 2023).

In addition to social characteristics, cultural characteristics are now being considered. This is reinforced by previous interventions that suggest that interventions based on sociocultural characteristics and focused on SCT theory can reduce bullying and victimization (Salimi et al., 2019). Furthermore, recent research suggests that a positive culture that

supports bullying prevention in schools involves parents, teachers, administrators, and community members (Donoghue et al., 2025). The involvement of all parties in controlling bullying in schools is crucial, given the different roles each component plays.

This study emphasizes the potential of digital-based social-emotional learning interventions in developing adolescents' emotional and social competencies. Previous research has demonstrated the importance of assessing school climate and implementing gender- and grade-level-specific prevention programs focused on social-emotional learning (Yang et al., 2020). The individuals with lower levels of moral detachment are less likely to be involved in bullying at school (Kokkinos & Kipritsi, 2018). Evaluation of decision-making skills was also found to be effective in preventing bullying. This finding aligns with previous research that suggests effective decision-making can encourage bystanders or victims to take action against bullying, thereby reducing its occurrence (Donoghue et al., 2025). Furthermore, decision-making using the logic model approach to anti-bullying in Abu Dhabi involved multiple stakeholders and resulted in a strategic framework tailored to local needs (Al-ketbi, 2025). Social skills that adolescents need to develop while at school to prevent bullying include self-management, social awareness, and decision-making. Teenagers who lack a sense of belonging tend to perceive themselves as outsiders, leading to abusive behavior.

In another aspect, this intervention has an influence on the ability of adolescents to improve their skills in helping victims of bullying, this is in line with recent research that improving social-emotional skills can create a more supportive environment for victims, such as helping in emergency situations and having a commitment to being involved positively (Xiao et al., 2025). Adolescent who have good interpersonal, good empathy and stress management skills tend to be able to help adolescent intervene effectively and support victims of bullying to live more meaningful lives (Song & Kim, 2022).

Children's decision-making is also influenced by policy decisions within the school environment. A key implication for nursing practice, particularly for community nursing, which plays a strategic role as educators, facilitators, and health advocates and to choose a social emotional approach as an effective intervention in preventing bullying, in addition it is important for schools to integrate digital-based social-emotional learning into their curriculum for first grade students. This study has several limitations that should be acknowledged, the research design was limited to a quasi-experimental approach with a relatively small sample size, which may restrict the generalizability of the findings to broader adolescent populations. The participants were recruited from a specific school setting, and differences in school climate, peer relationships, or socio-cultural backgrounds in other contexts

might influence the intervention outcomes. Second, the data were collected based on self-reported measures, which are subject to response bias and social desirability effects. Finally, the study did not control for all potential confounding variables, such as family dynamics, peer influence outside school, or prior exposure to anti-bullying programs, which could have affected the observed effects.

Conclusion

Digital Social Emotional Skills Training is effective in improving bullying prevention skills and victim-supporting behavior. These findings strengthen social behavioral theories and provide practical contributions to the development of mental health education and promotion programs among adolescents. Preventing bullying among adolescents in schools requires specific and comprehensive interventions. Academic-based approaches are no longer the primary factor; instead, students' socialization and emotion management skills are more important. Digital social-emotional skills training has a positive impact on reducing the risk of students becoming bullies. Schools and families play a crucial role in accustoming children to a life free from bullying.

Based on the results of this study, the Digital Social Emotional Skills Training program can be recommended to be integrated into school health programs to create a safe and positive environment and support the improvement of adolescent mental health, especially at the junior high school level. Future research is recommended to test the effectiveness of Digital Social Emotional Skills Training with a larger sample size and broader coverage.

Declaration of Interest

All authors declare that they have no conflict of interest.

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Data Availability

This data exists and is complete

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