

Effectiveness of animation media in enhancing empathy to prevent bullying behavior in Madurese adolescents

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Abstract. Bullying is a major problem in schools, involving aggressive and intentional behavior against others. This study aimed to investigate the effectiveness of animated media in enhancing empathy among high school students as a preventive measure against bullying. The research was conducted at State Senior High School 2 Bangkalan–Madura, using a pretest-posttest control group design. Students with low empathy levels were chosen through purposive sampling. The empathy of these students was measured using The Perth Empathy Scale (PES) and the Interpersonal Reactivity Index (IRI). The study divided students into two groups: experimental group watched three animated videos about different types of bullying (physical, verbal, and relational), while the control group did not receive any intervention. The effectiveness of the animated videos was evaluated by comparing empathy levels before and after the intervention. The results showed that the experimental group had a slight increase in empathy, with an average N-Gain Score of 0.21, which is considered low. However, a statistical test showed a significant improvement in empathy in this group, with a Sig. (2-tailed) value of $0.001 < 0.05$, indicating that the videos made a meaningful difference. The control group did not show any significant change. This study concludes that animated media can be an effective tool to enhance empathy among adolescents, although the effect was small. It suggests that animated videos could be used in educational and psychological practices to help develop empathy in adolescents, which is crucial for preventing bullying in schools.

1 Introduction

Acts of violence and bullying are frequently occurring among children and adolescents. Data from the Ministry of Women's Empowerment and Child Protection of the Republic of Indonesia [1] indicate that three out of four children and adolescents experience violence, with their own peers often being the perpetrators. Peers, who should serve as companions for learning and playing together, can potentially become a source of problems in the lives of children and adolescents.

According to UNICEF, approximately 41% of Indonesian students aged 15 have experienced bullying several times a month in 2018 [2]. Another set of data showed that throughout 2023, there were 30 recorded cases of bullying, with the majority occurring in junior high schools [3]. A survey conducted by the Ministry of Social Affairs of the Republic of Indonesia reports that at least 84% of children aged 12 to 17 years experience bullying at school [4]. From data on bullying in Indonesia, we can clearly see that bullying behaviour often occur among adolescent. Bullying is a dangerous behaviour that can make someone, or victim, feel depressed. In 2020, UNICEF Indonesia reported that approximately 40% of suicide cases in Indonesia were linked to bullying [5]. This figure highlights the serious impact of bullying on the mental well-being of children and adolescents.

Adolescents with low empathy cannot recognize and understand the emotions of bullying victims, thus they do not feel the negative impact of their actions [6]. This inability makes them more prone to engage in aggressive behavior without feeling guilty or sympathetic. Some research explains that reduce an aggressive behavior and prosocial in adolescents can be improved with animated movies [7]. Moreover, there is a program called “Roots of Empathy” that teaches about empathy through animated movies, using story and the character [8]. This program designed for children and adolescents ages 5 to 13. This shows that empathy plays an important role in reducing bullying and animated media can potentially increase empathy in adolescents.

In Madura, Indonesia, bullying cases among adolescents are quite high and have many effects on student's life. Addressing these bullying issues is crucial for improving their well-being and mental health. In 2023, a student at High School 1 in Bangkalan (one of the districts in Madura) reported being bullied by her friends to the police. She experienced physical abuse, including having her hair pulled, her skin scratched, and being punched by her friends [9]. In 2018, there were 15 cases reported in the Bangkalan district. The Women and Child Protection Unit in Bangkalan recorded 7 cases of rape, 1 case of child neglect, 1 case of child abduction, and 6 cases of physical abuse [10].

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1.1 Bullying and adolescents

Bullying behavior can occur to anyone—children, adolescents, or adults. However, it is more prevalent among adolescents. The high incidence of juvenile delinquency is a consequence of adolescents' inability to control their emotions in ways that are acceptable to social norms. This leads to adolescents being easily influenced by their peer group to engage in certain behaviors, especially negative ones, including bullying [11]. The study on students in Bantul, Yogyakarta, aged 8-10 years, revealed that the types of bullying carried out by children and adolescents can include physical bullying, verbal bullying, and relational bullying [12]. Physical bullying may consist of fighting, hitting, pushing, pinching, chasing, throwing objects, pulling hair, placing trash or dirt on a peer's head, and hiding belongings. Verbal bullying can take the form of giving peers odd and unkind nicknames, shaming, yelling at, and disturbing peers. Relational bullying may involve ignoring peers, avoiding them, or gesturing with a fist towards them.

The number of bullying cases among adolescents can be attributed to many factors [6], [13], [14]. The first factor is individual characteristics; adolescents with narcissistic traits, arrogance, and a lack of empathy are more vulnerable to becoming bullying perpetrators. On the contrary, adolescents with low self-esteem or poor self-control are more vulnerable to becoming bullying victims. The second factor is peer group influence. Adolescents who are in groups that support bullying norms are more likely to be involved in bullying actions. The third factor is the school climate. An unhealthy or unsupportive school environment can increase the prevalence of bullying. The fourth factor is attitude of teacher and school staff. If teacher do not see bullying as an important problem or if they cannot recognize the forms of bullying (physical, verbal, and relational), then they may not intervene. The fifth factor is the family environment. Family characteristics, such as warmth and the presence of a father, as well as tolerance for aggression, can increase the risk of children becoming bullying perpetrators.

1.2 Bullying and empathy

Bullying behavior can occur in schools due to a lack of empathy among perpetrators, insufficient prevention by schools, and triggers stemming from a general indifference among students [12]. Bullies engage in such behavior because of their low empathy, which results in an inability to recognize and understand others' feelings and perspectives, as well as a lack of appropriate concern [15]. Empathetic adolescents not only avoid bullying behavior but are also more likely to intervene when they witness bullying [16]. They can act as defenders or mediators, helping to stop or reduce bullying incidents.

Adolescents with high empathy tend to feel guilty and uncomfortable if they hurt others, thereby reducing the likelihood of them engaging in bullying [17]. So, individuals with high levels of empathy tend to avoid causing trouble for others, thereby not engaging in bullying behaviors, which they know would harm or

create difficulties for others [18]. From this discussion, it can be concluded that empathy plays a crucial role in preventing bullying behavior among adolescents and can lead to the development of a fully realized human being. Being fully human requires the ability to feel remorse, guilt, and understand the feelings of others, as well as the capacity to put oneself in another's position [19].

1.3 Bullying and Madurese adolescents

In the Madurese tribe, the "carok" symbol is associated with fights involving two or more large families, between groups, or regions. Additionally, the clurit weapon symbolizes Madurese society. These symbols are linked to aggressive behavior [20]. Dharmawan et al. [21] reported that the carok phenomenon in Madurese society is tied to conflicts and pride. This pride is also evident among Madurese adolescents have higher self-esteem compared to non-native students in a given school. This is evidenced by cases at State Junior High School 3 Kamal, where bullying behavior, both verbal and physical, has occurred [22]. They insult, mock, scorn, ostracize, and intimidate students from the Java region. Additionally, they also engage in physical assaults and fights with the victims of bullying. Moreover, Dewi's [23] research indicated that bullying behavior is significantly higher in late adolescents, at 61.11%, compared to early adults within the Madurese ethnicity. Therefore, this research targets Madurese adolescents, where the level of bullying remains high and empathy needs to be improved to prevent bullying behavior among adolescents.

1.4 Animation media and empathy

Addressing the issue of bullying is a part of school ethics regulations under the authority of school officers or guidance counselors [24]. There are many methods that schools can implement to counteract bullying behavior, including Emotional Literacy Training and Anti-bullying programs [25]. One Anti-bullying program method that can be employed is the use of auxiliary media, such as animation, which can help optimize the social development of adolescents. Innovative and creative educational models like animated media are a demand of technological advancement and the limited time available for classroom learning [26]. This aligns with Azwar's [27] statement that an individual's attitude towards an object in their environment always acts as a mediator between the response and the object in question. Hesley & Hesley [28] explain that audiovisual media can serve as an effective therapeutic tool for individuals to overcome emotional barriers. In the "Roots of Empathy" program, which aims to develop empathy in children and adolescents, there is an animation media watching component. This component is expected to help students develop the ability to feel and understand the emotions of others through the stories and characters they watch [8].

This study uses animation media because it is considered an innovative step compared to traditional methods. Animation has the power to convey emotions and complex situations visually, which can help

adolescents more easily understand and empathize with what others are experiencing [29]. Animation allows for the delivery of consistent and uniform messages to all students [30]. By using the same characters and stories, all students can receive the same information in an engaging and accessible way [31]. With advances in technology, animation has become more accessible and can be integrated into school curriculum at a relatively low cost [32]. Modern technology enables the creation of high-quality animated content that can be tailored to the specific needs of students and schools [33].

The animated media used in this research consists of a short animated film of approximately 10 minutes, which contains content aimed at fostering empathy to prevent bullying behavior among adolescents. This approach is based on the study by Rahayu & Permana [34], which identifies three types of bullying among adolescents: (a) physical bullying, (b) verbal bullying, and (c) relational. The delivery of this information will also be conducted in several stages according to Gregerson [35], which include (1) Orientation, preparing and arranging instructions for students to watch the animation video, such as paying attention to the position while watching, staying comfortable, and regulating breathing; (2) Story selection, where the research team will create a video tailored to the needs of adolescents in developing empathy; (3) Discussion, where the research team will engage students in discussions about the video they have watched and encourage students to take notes for later discussion.

Based on the background outlined above, the researcher is interested in conducting a study on "Effectiveness of Animation Media in Enhancing Empathy to Prevent Bullying Behavior in Madurese Adolescents" The researcher aims to analyze the effectiveness of animation media in increasing empathy among high school students especially in Madurese adolescents. This animation media is also created as creatively as possible and tailored to the needs of adolescents to enhance their empathy towards others and their environment.

2 Methodology

This research used a quantitative approach using an experimental research method. An experimental method is a type of research that seeks to determine the effect of certain variables on other variables under controlled conditions [36]. According to Suryabrata [37], the purpose of experimental research is to obtain information that can be derived from experiments which, in reality, may not be feasible to control and/or manipulate relevant variables. This study employed a true experimental design using a Pretest-Posttest Control Group. We used this design to measure changes in the dependent variable (empathy) caused by the intervention (animated media). By comparing the pretest and posttest scores of the experimental and control groups, we can determine the extent of the changes that occurred as a result of the intervention. Additionally, by having a control group, we can compare the results of the group that received the intervention with the group that did not receive the

intervention. This design is established using initial screening to filter students with low empathy. Subsequently, all groups are given a pretest to assess initial empathy levels. Thereafter, the experimental group is treated three times with an animation video to enhance empathy. The control group does not receive any treatment. Following this, both groups are given a posttest to observe the differences between the pretest and posttest in both groups. The research design to be conducted in this study explained in Figure 1 The experimental design in this research:

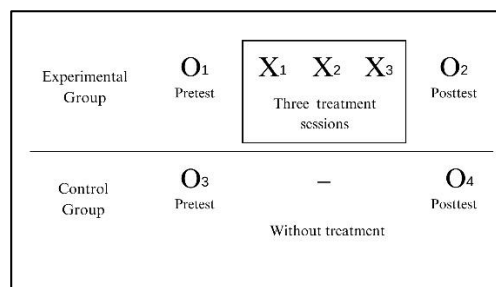


Fig. 1. The experimental design in this research.

The location for this study is State Senior High School 2 Bangkalan. Several reasons for conducting this research include the lack of previous studies on empathy or bullying at State Senior High School 2 Bangkalan. Additionally, there have been reports of bullying behavior among its students, particularly those in the 11th grade.

The subjects of this study are high school students, who fall within the adolescent age range. The subject selection technique employed is purposive sampling, which is allowed us to select participants based on specific criteria, namely students with low levels of empathy. This is because the aim of the research is to observe the effects of animated media in increasing empathy in individuals who initially have low levels of empathy. The criteria for subject selection are students in the 11th grade, chosen because at this stage, students are in the middle phase between 10th and 12th grades. Students in the 11th grade are not in an orientation or adaptation phase, nor are they focused on high school or university entrance exams. Furthermore, all 11th-grade students are screened again for low empathy levels based on pretest results. Students who fall into this group will receive treatment and a posttest.

The detailed steps of the experiment conducted in this research are explained as follows: (1) After conducting a literature review and designing the research (including the design of the pretest-posttest and the creation of animated videos), we screened all 11th-grade students using an empathy scale adapted from The Perth Empathy Scale (PES) developed by Brett et al., [38]. At the same time, we tested the content of the videos to ensure we met the research criteria. (2) After identifying 38 students with the lowest empathy scores with PES, we evenly divided them into two groups. The first group was the experimental group, and the second group was the control group. (3) We administered a pretest to all groups using the Interpersonal Reactivity Index (IRI) scale by Davis [39], which has been validated and tested for reliability by Tahrir et al. [40], and has been widely used to measure empathy. (4)

Then, we provided three treatments to the experimental group in the form of animated videos. The control group did not receive any treatment. (5) Afterward, the researcher administered a posttest to both groups using the Interpersonal Reactivity Index (IRI) scale, with the

question numbers randomized. (6) Finally, analyze the data using statistical methods to determine the effectiveness of the intervention in the form of animated media. The explanation of the research steps can be seen in Figure 2 Research Flowchart.

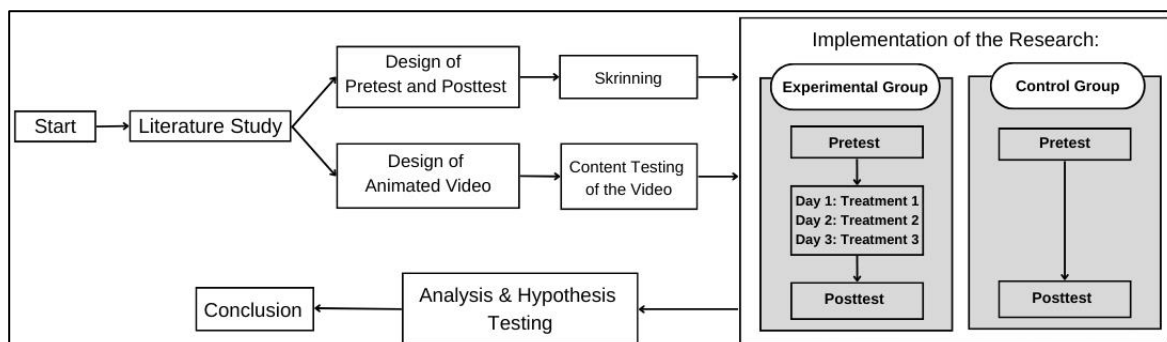


Fig. 2. Research flowchart.

3 Result

Before initiating the treatment, the researchers conducted a pretest on both the control and experimental groups to evaluate the effect of the forthcoming treatment using the Interpersonal Reactivity Index (IRI) scale. The objective was to observe differences in empathy levels between the experimental group, which received the treatment, and the control group, which did not. The treatment was administered to the experimental group in three sessions, each lasting 60 minutes. Both the experimental and control groups consisted of 19 members each.

The researchers first established a good rapport with the experimental group before administering the treatment. The treatment consisted of three animated videos, each addressing physical, verbal, and relational bullying. These videos depicted various bullying behaviors, their consequences, and the empathetic responses of the characters involved. Following each treatment session, the researchers engaged the experimental group in reflective discussions about the content of the videos and their application in everyday life. In the final meeting, the researchers administered a posttest to both groups, experimental and control, using the Interpersonal Reactivity Index (IRI) with random numbering. The results include the pretest and posttest scores, as well as the N-Gain scores of the experimental groups.

Based on the calculation of the N-Gain Score for the experimental group, it was found that the average or mean score was 0.2078, which we round off to 0.21. The N-Gain score is a metric used to measure the effectiveness of an intervention or treatment in research, as well as to assess the improvement in students' learning outcomes or specific abilities. The N-Gain Score was observed only in the experimental group, as this group received the treatment three times, and the effectiveness of the treatment was being assessed. Next, we referred to Hake's in table 2 for interpreting the effectiveness categories of N-Gain scores and entered the mean percentage result into

the N-Gain score table for the experimental group. The results showed that the mean N-Gain Score of 0.21 falls between $0.0 < g < 0.30$, categorizing it as low. This indicates that the animated media intervention has a positive effect on increasing empathy, though its effects are still limited. This suggests that animated media can be an effective tool for empathy enhancement programs but may need to be integrated with other methods or further refined to be more effective.

Table 1. Experimental group test scores.

No	Initial	Pretest	Posttest	N-Gain score
1	JFI	60	72	.50
2	AZ	61	66	.22
3	SAA	62	63	.05
4	PAA	65	72	.37
5	SA	63	68	.24
6	GA	63	65	.10
7	BRF	65	70	.26
8	MAA	64	64	.00
9	MA	65	63	-.11
10	NIP	66	69	.17
11	ISA	65	74	.47
12	RCR	60	57	-.13
13	AM	61	62	.04
14	REV	55	66	.38
15	RA	59	62	.12
16	DNZ	68	72	.25
17	NH	68	80	.75
18	DAS	62	63	.05
19	SLM	66	70	.22
Total		1198	1250	
Mean				0.2078
Minimum				-0.13
Maximum				0.75

Table 2. Interpretation of N-gain Index.

N-Gain Score (g)	Interpretation
$-1.00 < g < 0.0$	Decrease
$g = 0.0$	Stable
$0.0 < g < 0.30$	Low
$0.30 < g < 0.70$	Average
$0.70 < g < 1.00$	High

Source: Hake (cited in Sundayana [41]).

Based on the results of the pretest-posttest calculations for the experimental group using a paired sample t-test as shown in Table 3, a Sig. (2-tailed) value of $0.001 < 0.05$ was obtained. From these results, it can be concluded that there is a significant difference in the average empathy scores between the pretest and post-test for the experimental group. In contrast, for the control group, a Sig. (2-tailed) value of $0.62 > 0.05$ was obtained, indicating no significant difference in the average empathy scores within the control group. These findings suggest that the treatment using animated media can effectively increase empathy levels in adolescents.

When calculated based on the posttest scores of the experimental group compared to the control group, under the category of equal variances assumed as shown in Table 4, a Sig. (2-tailed) value of $0.003 < 0.05$ was observed. This indicates that there is a significant difference between the average posttest scores of the experimental group and the control group. The posttest results of the experimental group showed a higher average score (mean 67.26) compared to that of the control group (mean 62.00), as indicated by a mean difference of 5.263. The mean values for the posttest of both the experimental and control groups can be viewed in Table 5.

Table 3. Experimental group pretest-posttest result.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Experiment Pretest - Experiment Posttest	-4.211	4.392	1.008	-6.327	-2.094	-4.179	18	.001
Pair 2	Control Pretest - Control Posttest	3.526	7.720	1.771	-.195	7.247	1.991	18	.062

Table 4. Posttest scores of the experimental group and the control group.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Empathy	Equal variances assumed	1.246	.272	3.132	36	.003	5.263	1.680	1.855	8.671
	Equal variances not assumed			3.132	35.692	.003	5.263	1.680	1.854	8.672

Table 5. Mean of experimental and control group.

	Group	N	Mean	Std. Deviation	Std. Error Mean
Empathy	Experiment Posttest	19	67.26	5.414	1.242
	Control Posttest	19	62.00	4.933	1.132

4 Discussion

This study aimed to evaluate the effectiveness of using animated media to enhance empathy among high school adolescents. Utilizing a pretest-posttest method, the study measured empathy levels in both the experimental and control groups, before and after the treatment. Initially, the researcher conducted a pretest using the Interpersonal Reactivity Index (IRI), which is validated for its reliability, to determine the baseline empathy levels in both groups. The primary purpose of the pretest was to observe differences in empathy levels between the experimental group, which received the treatment, and the control group, which did not.

The treatment given to the experimental group consisted of three animated videos, each addressing physical, verbal, and relational bullying. This approach is based on research indicating the effectiveness of visual media in enhancing awareness and empathy. These videos were designed to depict various bullying behaviors and their consequences, as well as to evoke feelings of empathy in viewers. Following the treatment, a posttest was conducted to assess changes in empathy levels. The

N-Gain Score results for the experimental group showed an average increase of 0.21, classified as low according to Hake's classification. Although this increase is considered low, it indicates that the treatment using animated media is effective in enhancing empathy. The study by Bindman et al. [42] indicates that viewers who merely observe a show exhibit lower levels of narrative engagement and empathy compared to those who perceive themselves as a character within the show. This can be applied to the current study, where the possibility of students merely being observers in the animated media presentation may account for the low increase in empathy. In addition to the N-Gain score, we can directly observe the significant increase in the graph shown in Figure 3 (Graph of experimental group pretest and posttest results). Although some students had lower posttest scores, the overall trend indicates a substantial improvement.

Bahri et al. [43] focused their study on enhancing empathy through emotionally connected animated cinema to understand others' feelings and address challenges in developing empathy among adolescents. Their research indicates that animated cinema is effective in increasing empathy in adolescents. Human Computer Interaction

(HCI) can also include animated media, which is beneficial for enhancing social skills in adolescents (including empathy enhancement), as it allows for the creation of content tailored to meet adolescents' needs through simulations of their real-life experiences [44]. Parmar et al. [45] studied how a story in the form of animation, voice, and movement can enhance trust and empathy among users of Amazon Mechanical Turk (AMT). Although the study did not specify exact figures regarding the age and number of participants, it explained that the capability of animation significantly influences the increase in empathy among users. This aligns with our research, where empathy in students increased after being provided with animated media. The difference between Parmar et al.'s study and ours lies in the subjects who received the treatment.

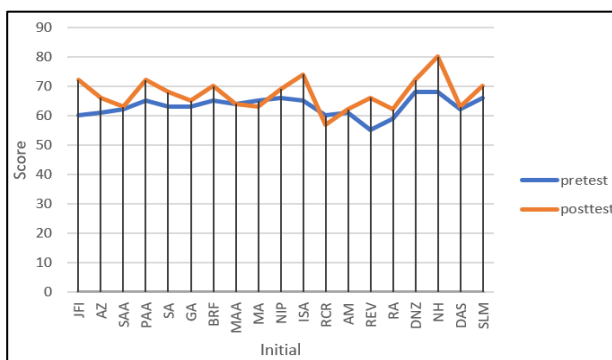


Fig. 3. Graph of experimental group pretest and posttest results.

Furthermore, the analysis using a paired sample t-test shows a Sig. (2-tailed) value of $0.001 < 0.05$. This indicates a significant difference in the empathy scores in the pretest and posttest of the experimental group, affirming that the treatment had a positive effect on the experimental group. When comparing the posttest results between the experimental and control groups, a significant difference was observed, with the experimental group showing a higher increase in empathy, with a mean difference of 5.263. This demonstrates the effectiveness of using animated media in enhancing empathy among adolescents. This aligns with the research by Berney and Bétrancourt [46] which revealed that animation has a positive effect on learning general knowledge compared to using static graphics. Rodríguez et al., [47] assert that creating digital stories using images and sound is highly beneficial for voicing opinions for those who cannot share stories directly in reality. With animated and digital media, the educational world becomes more engaging and rich in information for sharing stories and experiences. Individuals are encouraged to be more involved in learning and more expressive in developing their personalities. The study conducted by Adams et al. [48] focused on the use of animated media as a means to enhance empathy in addressing implicit bias in the medical field. Although the subjects and objectives were different, animated media can also increase empathy in anyone, including adults.

The research conducted by Razzaq et al. [49] reveals that 65.8% of all subjects were unaware that they had been

engaging in bullying behavior. When researchers introduced an intervention in the form of educational videos using cartoons and provided information about bullying behavior before and after the intervention, bullying behavior decreased to 22.5%. This study employs a similar method, where students were informed about bullying actions before and after the intervention. The results also showed a significant decrease in bullying behavior. This can be explained by Brame [50], who suggests that videos may hold particular value for students because they are more engaging and suitable for illustrating abstract phenomena or concepts that are difficult to visualize.

Based on the findings of this study, it can be concluded that the use of animated media is a moderately effective method, albeit in a low category, for enhancing empathy among high school adolescents. This underscores the importance of selecting appropriate methods and materials in psychoeducational interventions, particularly in the context of bullying and empathy development. Chapman [51] elucidates that the use of animated media can enhance empathy and compassion among adolescents and educators. With animated media, individuals can connect and offer profound experiences to realize and implement jointly constructed knowledge.

Jackson et al., [52] explain that individuals viewing a story in animated media can more easily understand, feel emotions, and develop the ability to empathize with others' emotions. The use of animated media as a learning tool is also crucial for observing, interpreting, and responding to emotional expressions, as well as training students to develop their social skills. Learning through videos also provides benefits for other students. Besides making the perpetrators of bullying aware, digital stories can also make students who might become victims aware of the physical and verbal violence inflicted upon them by others [53]. The utilization of animation media, as part of information and communication technology, is a highly useful tool for intervening with students to support their emotional, social, and psychological well-being. However, research conducted by Nocentini et al., [34] indicates that in the prevention and intervention against bullying behavior, it is still underutilized by educators. This is despite the fact that we are aware of the rapid and expansive advancements in technology today.

Findings from this study indicate that the use of animated media can be an effective tool in empathy education, particularly among high school adolescents. This provides new insights for educators and practitioners in designing more engaging and relevant psychoeducational interventions for the adolescent experience. The study suggests that creating more interactive and immersive educational content, such as animation, can enhance narrative engagement and empathy among students. This opens opportunities to integrate animated media technology into the educational curriculum. Additionally, animated media can also play a significant role in the development of social skills in adolescents, including the ability to recognize and respond to emotional expressions. Although visual media can prevent bullying behavior, the active involvement of educators in viewing bullying as negative behavior and

consistently promoting anti-bullying programs as a further preventive measure is crucial in preventing the emergence of bullying in schools [54].

5 Limitations

This study may have limitations in sample size and participant diversity, which could affect the generalizability of the findings. The study focuses on the short-term effects of using animated media to enhance empathy. The long-term effectiveness and sustained impact of this intervention have not been fully explored. This research relies on self-report measures to assess empathy, which may be subjective and prone to bias. Individual experiences with animated media can vary, and this study may not fully capture how individual differences affect engagement and empathy. Although this research uses a pretest-posttest design, there may be other factors influencing the results that are not fully controlled or identified in the study.

6 Future work

A key area of interest lies in conducting longitudinal studies to understand the long-term effects of animated media on empathy development. Such research could provide valuable insights into how empathy evolves over time with sustained exposure to animated media. Additionally, broadening the participant demographic in future studies to include a diverse range of cultural backgrounds, ages, and socio-economic statuses will be crucial. This approach will help determine the universal applicability of animated media in fostering empathy across different segments of society. Exploring various types of animated media, such as interactive animations and virtual reality experiences, could also offer deeper insights into the specific attributes that most effectively foster empathy.

Another significant area for future research is the integration of animated media into standard educational curriculum. Investigating how animated media complements traditional teaching methods could provide insights into enhancing student engagement and empathy development. Comparative studies with other educational tools and interventions could also help identify the most effective strategies for empathy education. Furthermore, understanding the emotional nuances elicited by different animations and their contribution to empathy development could add depth to our comprehension of how animated media impacts adolescents. Lastly, advancements in technology, like augmented reality and artificial intelligence, present exciting possibilities for enhancing the effectiveness of animated media in empathy education. Future research in these areas could lead to innovative methods for empathy development, leveraging the latest technological innovations.

7 Conclusion

This study demonstrates that the use of animated media is effective in enhancing empathy among high school adolescents, although its effectiveness is categorized as low. Through pretest and posttest methods, this research successfully measured changes in empathy levels in the experimental group, which received treatment in the form of animated videos, and the control group, which did not receive such treatment. The N-Gain Score results from the experimental group showed an average increase of 0.21, falling into the low category according to Hake's classification. This indicates that the animated media intervention has a positive effect on increasing empathy, though its effects are still limited. This suggests that animated media can be an effective tool for empathy enhancement programs but may need to be integrated with other methods or further refined to be more effective.

From a statistical analysis perspective, the paired sample t-test conducted showed a Sig. (2-tailed) value of $0.001 < 0.05$ in the experimental group, indicating a significant difference in empathy values before and after the treatment. This suggests that the treatment involving animated media had a positive effect in enhancing empathy in the experimental group. Meanwhile, in the control group, a Sig. (2-tailed) value of $0.62 > 0.05$ indicated no significant difference, meaning there was no significant change in empathy without the treatment.

Furthermore, when comparing the posttest results between the experimental and control groups, a significant difference was found with a Sig. (2-tailed) value of $0.003 < 0.05$. The experimental group showed a higher average value compared to the control group, with a mean difference of 5.263. This confirms that the use of animated media is significantly more effective in enhancing empathy compared to not using such media.

Overall, this research underscores the importance of using animated media as a tool for enhancing empathy among adolescents, even though its level of effectiveness is considered low. These findings provide important insights for educational and psychological practitioners about the potential of animated media in psychoeducational interventions, especially in the context of developing empathy among adolescents. Despite its moderate effectiveness, the use of animated media demonstrates a promising approach to fostering empathy in adolescents, offering valuable insights for enhancing psychoeducational interventions. This study highlights the potential for integrating animated media into educational curriculum, paving the way for more engaging and impactful methods to cultivate empathy and reduce bullying behavior among adolescents. By leveraging the engaging nature of animation, educators and psychologists can develop more effective programs that resonate with adolescents, ultimately contributing to healthier and more empathetic school environments.

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