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Watching cartoons as an adolescent: the role of animated videos on aggression among high school students

Menonton Kartun Bagi Remaja: Peran Video Animasi Terhadap Agresi di Kalangan Siswa Sekolah Menengah Atas

Desmaniarti Zaini[1], Vera Fauziah Fatah[1], Lia Meilianingsih[1], Tri Antika Rizki Kusuma Putri[2]

[1]Politeknik Kesehatan Kemenkes Bandung, Bandung, Indonesia
[2]Sekolah Tinggi Ilmu Keperawatan PPNI Jawa Barat, Bandung, Indonesia
*Email: tri.antika90@gmail.com

ABSTRACT

Background: *Aggressive behavior among secondary school students, including bullying and acts of revenge, constitutes a significant public health concern, particularly in Indonesia. Despite various interventions implemented by schools and families, aggressive tendencies persist, with many adolescents continuing to engage in physical violence.*

Objective: *This study aimed to examine the effectiveness of animated video media in reducing aggressive behavior among secondary school students in Bandung City, Indonesia.*

Methods: *This pre-experimental study involved 208 secondary school students in Bandung City, Indonesia. Participants were assigned to either an intervention group (n = 104) or a control group (n = 104). The intervention group viewed a 30-minute animated educational video each day for seven consecutive days, focusing on understanding and managing aggression. Levels of aggression were assessed using the Buss–Perry Aggression Questionnaire through pre-test and post-test evaluations.*

Results: *The findings revealed a statistically significant reduction in aggression levels among participants in the intervention group ($p < 0.001$), whereas the control group exhibited no significant change ($p = 0.648$). Hostility and retaliatory thoughts were more prevalent among younger adolescents. Regression analysis identified age, physical aggression, and anger as significant predictors of total aggression.*

Conclusion: *The study underscores the potential of animated educational media as an engaging and developmentally appropriate intervention for preventing aggressive behavior in the digital era. The integration of multimedia-based learning into school health programs aimed at improving emotional regulation and conflict resolution skills may serve as an effective strategy to mitigate aggression among adolescents.*

Keywords: *adolescent, aggressive, animation, video*

ABSTRAK

Latar Belakang: Perilaku agresif di kalangan siswa sekolah menengah, termasuk perundungan dan pembalasan dendam, merupakan masalah kesehatan masyarakat yang signifikan, khususnya di Indonesia. Meskipun ada intervensi oleh sekolah dan keluarga, perilaku agresi tetap ada, dengan banyaknya remaja terlibat dalam kekerasan fisik.

Tujuan: Penelitian ini bertujuan untuk menguji efektivitas media video animasi dalam menurunkan perilaku agresif pada siswa sekolah menengah di Kota Bandung, Indonesia.

Metode: Penelitian ini merupakan studi pra-eksperimental yang melibatkan 208 siswa sekolah menengah di Kota Bandung, Indonesia. Partisipan dibagi menjadi kelompok intervensi (n = 104) dan kelompok kontrol (n = 104). Kelompok intervensi diberikan video edukasi animasi berdurasi 30 menit setiap hari selama tujuh hari berturut-turut yang

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berfokus pada pemahaman dan pengelolaan agresi. Tingkat agresivitas diukur menggunakan kuesioner Buss–Perry Aggression Questionnaire melalui evaluasi pre-test dan post-test.
Hasil: Hasil penelitian menunjukkan penurunan signifikan tingkat agresi pada kelompok intervensi (p = 0,000), sementara kelompok kontrol tidak menunjukkan perubahan signifikan (p = 0,648). Permusuhan dan pemikiran pembalasan dominan pada remaja yang lebih muda. Analisis regresi menegaskan usia, agresi fisik, dan kemarahan sebagai prediktor agresi total.
Kesimpulan: Studi ini mendukung penggunaan media edukasi animasi sebagai alat pencegahan agresi yang menarik dan sesuai perkembangan di era digitalisasi. Integrasipembelajaran multimedia dalam program kesehatan sekolah untuk meningkatkan regulasi emosi dan keterampilan penyelesaian konflik dapat dipertimbangkan untuk menurunkan agresi pada remaja.

Kata kunci: agresif, animasi, remaja, video

INTRODUCTION

Aggressive behavior among high school students, including various forms of bullying, remains a persistent and deeply concerning issue despite ongoing intervention efforts by both schools and families.[1] Bullying, in particular, has emerged as a major public health concern due to its widespread nature and the serious consequences it can have on individuals' mental, emotional, and physical and psychological well-being.[2,3] Although schools implement anti-bullying policies, awareness campaigns, and counseling services, and families strive to guide and support their children, the problem continues to thrive. [4,5]

According to The Global Status Report on Preventing Violence Against Children by the World Health Organization, one in three students aged 13-15 years has been involved in a physical fight, and those who experience bullying are significantly less likely to complete their education.[6] Interviews with high school students further reveal that many have participated in violent acts such as school fights and inter-school brawls. Such data highlights the ongoing urgency to identify and implement more effective strategies to reduce aggression among adolescents.

From a theoretical perspective, aggressive behavior can be understood through Bandura's Social Learning Theory, which emphasizes that individuals learn aggressive responses through observation, imitation, and reinforcement[7]. When adolescents are repeatedly exposed to aggressive models—whether peers, family members, or media—they are more likely to adopt similar behaviors. The General Aggression Model (GAM) further explains that aggression results from the interaction of personal and situational factors that influence cognitive, affective, and arousal states.[8,9] These theories suggest that interventions targeting the cognitive and emotional components of aggression—by reshaping thought patterns and emotional responses—can effectively reduce aggressive behavior.

Educational media, particularly animated videos, provide a promising platform for applying these theoretical concepts. Media can be a powerful tool to help students understand complex material, especially when tailored to suit their developmental stage[10]. Previous studies have shown that certain types of media, such as flipcharts and modules, can significantly improve knowledge and learning outcomes.[11,12]

Animated media enables the vivid portrayal of real-life situations, allowing students to see the consequences of aggressive behavior and learn positive alternatives in a controlled and engaging context.[13,14] Moreover, interactive video learning is a dynamic and efficacious method to engage students and augment instruction in the expanding field of academia. Animated videos are particularly effective because they can simplify

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complex emotional and social dynamics while maintaining high levels of engagement among adolescents.[15]

However, despite the growing use of educational media in health and behavioral education, empirical evidence remains limited regarding the effectiveness of animated videos in reducing aggressive behavior among high school students, especially in non-Western or developing country contexts such as Indonesia. Previous studies have focused mainly on knowledge improvement or attitudinal change rather than measurable behavioral outcomes.[16] Therefore, a clear research gap exists in assessing whether animated video interventions can produce significant, real-world reductions in aggression levels among adolescents.

This study proposes the development and evaluation of an animated video intervention specifically designed to depict and address aggressive behaviors among high school students. The findings are expected to provide empirical evidence for the use of animated educational media as a behavioral modification tool, contributing to the fields of community nursing, educational psychology, and adolescent behavioral intervention. Ultimately, the study aims to provide actionable insights for schools, educators, and policymakers in developing innovative, evidence-based strategies to promote positive behavioral change among adolescents.

METHODS

Study design

This study employs a quantitative approach with a quasi-experimental research design, including pre- and post-test control groups. This design was chosen to understand the impact of animated videos on aggression levels among adolescents. The study was conducted at two public high schools in Bandung (West Java, Indonesia). The entire data collection process took place between February and October 2024.

Data source and sampling procedure

The study employed purposive sampling to enroll 208 students, who were assigned in equal numbers to the intervention and control arms. All necessary institutional and administrative approvals were secured. Participants in the study were students from two public high schools in Bandung. The control group received the intervention after completing the post-test, one week following enrollment in the pre-test. No additional interventions were provided to the control group during the study period.

Variables of the study

The independent variable in this study was the animated video intervention focusing on aggressive behavior management. The dependent variable was the level of aggression among adolescents. Aggression was assessed based on total scores and categorized into low, average, above average, high, and extremely high levels. The intervention included content on aggression prevention, behavioral control techniques, and deep-breathing relaxation as an alternative coping strategy.

Measurement and instruments

Data acquisition utilized the Buss-Perry Aggression Scale. The instrument consists of 29 items on a five-point Likert scale ranging from extremely uncharacteristic to extremely characteristic. The instrument demonstrated good internal consistency (Cronbach's α = 0.922). Item–total correlations ranged from 0.427 to 0.903, with all items meeting the ≥0.30 criterion. The questionnaire measures four aspects of aggression: Physical Aggression, Verbal Aggression, Anger, and Hostility. Total scores were categorized as Low (29–61), Average (62–76), Above Average (77–89), High (90–100), and Extremely High (101–149).

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Figure 1. Audiovisual education on recognizing and preventing aggressive behavior

Figure 2. Audiovisual education about deep breathing exercises

Data collection

The intervention consisted of seven meetings over one week, each lasting 20–30 minutes, which included viewing materials on aggression and its management through animated videos. The intervention was delivered for 7 days, both morning and evening, with a duration of 30 minutes per session.

Participants in the control group were shown the videos after completing the post-test. Prior to data collection, participants were given instructions on how to complete the questionnaire based on their personal experiences. Completed questionnaires were returned directly to the researcher to maintain confidentiality.

Ethical considerations

This research has received ethical approval from the Health Research Ethics Committee of the Bandung Ministry of Health Polytechnic under Number 10/KEPK/EC/VI/2024. Informed consent was obtained from all participants before participation, and confidentiality of personal data was strictly maintained throughout the study.

Data analysis

The assumption tests used in this study included tests for normality and correlation. Subsequently, multivariate analysis was performed using linear regression to examine both independent and confounding variables in relation to the dependent variable. Data analysis was conducted using SPSS version 23.

RESULTS

Among the 208 adolescents included in the study sample (Table 1). The proportion of males was slightly higher in the intervention group (44.2%) than in the control group (35.6%), while females remained the majority in both groups (a total of 60.1%). This difference was not statistically significant (p = 0.204), so the gender composition can be considered comparable between the groups.

The mean age was similar between groups (control: 16.60±0.66 years; intervention: 16.48±0.71 years; range: 15–18), with no significant difference (p=0.422). This indicates equivalence in grade level/developmental maturity.

Initial aggression scores. The mean baseline aggression scores were also comparable (control: 82.43 ± 9.70 vs. intervention: 81.50 ± 11.40; range: 57–121; p = 0.526). A standard deviation of approximately 10–11 indicates moderate variability in

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baseline aggression levels across the sample. The absence of significant differences in gender, age, and baseline aggression scores confirms that the control and intervention groups were equivalent at the start of the study. Thus, changes in aggression scores at follow-up are more likely to reflect intervention effects than bias.

Table 1. Characteristics of Aggression Among Adolescents

Variables	Control Group n=104 mean±SD	(min-max)	Intervention Group n=104 mean±SD	(min-max)	Total n=208 mean±SD	(min-max)	p-value*
Gender**							
Male	37(35.6%)		46(44.2%)		83(39.9%)		0.204
Female	67(64.4%)		58(55.8%)		125(60.1%)		
Age	16.60±0.662	(15-18)	16.48±0.71	(15-18)	16.54±0.687	(15-18)	0.422
Aggression	82.43±9.703	(57-121)	81.50±11.4	(57-121)	81.97±10.57	(57-121)	0.526

*homogeneity test utilized Levene test **n(%)

Figure 3 illustrates the difference in the average score for each aspect of aggressiveness. It is known that the anger aspect has the highest score in both groups compared to the other three aspects: physical aggression, verbal aggression, and hostility. However, hostility became the most dominant aspect of aggression for all respondents.

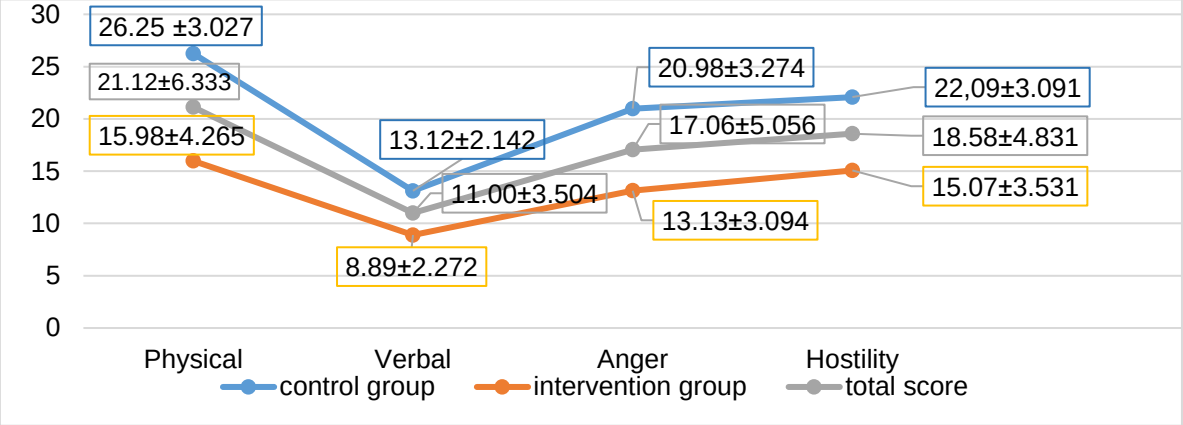

Figure 3. Average Differences in Aggression Scores Between Groups

Table 2 presents the average score for the answers to each question, indicating that the highest mean corresponds to a form of physical aggression, specifically a statement about revenge: "If somebody hits me, I hit back." Higher scores indicate a higher likelihood of aggressive thoughts, sentiments, and behaviors, as well as greater recognition of aggressive statements.

Table 2. Average Score per Item of the Buss-Perry Aggression Scale (n=208)

No	Item	Mean
1	Some of my friends think I am a hothead	3.17
2	If I have to resort to violence to protect my rights, I will.	2.41
3	When people are especially nice to me, I wonder what they want.	2.80
4	I tell my friends openly when I disagree with them.	2.33
5	I have become so mad that I have broken things.	2.49
6	I cannot help getting into arguments when people disagree with me.	2.05
7	I wonder why, sometimes I feel so bitter about things	2.25
8	Once in a while, I cannot control the urge to strike another person	1.82
9	I am an even-tempered person.	3.62
10	I am suspicious of overly friendly strangers.	2.10
11	I have threatened people I know	3.11

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No	Item	Mean
12	I flare up quickly, but get over it quickly	2.41
13	Given enough provocation, I may hit another person	1.90
14	When people annoy me, I may tell them what I think of them	2.74
15	I am sometimes eaten up with jealousy.	3.41
16	I can think of no good reason for ever hitting a person.	3.20
17	At times, I feel I have gotten a raw deal out of life	3.45
18	I have trouble controlling my temper	2.68
19	When frustrated, I let my irritation show	2.98
20	I sometimes feel that people are laughing at me behind my back	2.74
21	I often find myself disagreeing with people	2.77
22	If somebody hits me, I hit back	3.84
23	I sometimes feel like a powder keg ready to explode	2.93
24	Other people always seem to get the breaks	3.11
25	Some people pushed me so far that we came to blows	3.62
26	I know that "friends" talk about me behind my back	2.79
27	My friends say that I am somewhat argumentative	3.48
28	Sometimes I fly off the handle for no good reason	2.50
29	I get into fights a little more than the average person	3.08

Table 3 presents the results of the bivariate analysis test, conducted using the Wilcoxon test, with a p-value of 0.648 in the control group and 0.000 in the intervention group. This suggests that the intervention, which involves watching animated videos, can significantly reduce aggression levels in adolescents.

Table 3. The Effect of Animated Videos Towards Aggression Among Adolescents (n=208)

Variables	Pretest	Posttest	Mean Rank	Z	P-Value
Total score (Mean±SD)					
Control Group	82.43±9.703	82.79±9.968	45.95	0.457	0.648
Intervention Group	81.50±11.4	53.08±12.039	52.50	-8.808	0.000

Furthermore, Table 4 presents the results of the multivariate analysis using linear regression, with the posttest score in the group serving as the dependent variable, indicating that age has the greatest influence on adolescent aggression. The analysis results showed that the highest beta coefficient was found in the age group (-1.417), followed by physical aggression behavior (1.090) and anger (1.109).

Table 4. Regression Analysis of Aggression Behaviour

	B	SE	95%CI		t	P-value
			Lower	Upper		
Constant	27.205	5.322	16.711	37.698	5.112	0.000
Gender	0.285	0.398	-0.5	1.070	0.715	0.475
Age	-1.417	0.282	-1.972	-0.862	-5.034	0.000
Animated Video	-1.086	0.691	-2.448	0.277	-1.572	0.118
Physical Aggression	1.090	0.086	0.921	1.259	12.683	0.000
Verbal Aggression	0.858	0.124	0.615	1.102	6.946	0.000
Anger	1.109	0.099	0.914	1.304	11.200	0.000
Hostility	0.755	0.107	0.544	0.965	7.071	0.000

DISCUSSION

In this pre-experimental study of 208 Indonesian high school students from two public schools (science and social science tracks), evenly divided between the control and intervention groups. To ensure diverse representation, the sample included students from both science and social studies tracks. This diversity is important because it reflects the wider range of high school students who may engage with animated content in

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different educational settings. Students followed the national curriculum prescribed by the Indonesian Ministry of Education and Culture, which standardizes subjects and materials taught in both public and private high schools. This curriculum covers both scientific and social science subjects, providing a comprehensive educational framework that could influence how students engage with media content, including animated videos. We recognize that the educational environment, curriculum, and academic track of the students might have affected their responses and behaviors. For example, students in the science track may approach aggression and emotional regulation differently than their peers in the social studies track. While these factors may have influenced the outcomes of the study, the main goal was to assess the overall impact of animated videos on aggression levels among high school students. Future research can explore more about the influence of school backgrounds by controlling for these variables and comparing the effects of animated content across different types of schools or academic tracks.

Most participants were female (60.1%), although no statistically significant gender-based differences were observed in either group (p = 0.204). Some earlier studies suggested that males typically display higher levels of physical aggression[3,16,18]. However, this aligns with more recent perspectives that emphasize the complexity of aggression, including verbal and relational forms, which can be more prominent among females.[19] Males are more prone to physical aggressiveness (e.g., fighting, hitting, pushing), whereas females typically exhibit relational or indirect violence (e.g., gossiping, social exclusion, spreading rumors).[18,20] Boys are often socialized to be assertive or dominant, sometimes even rewarded for aggressive behavior. Rather than using overt aggressiveness, girls may resort to more covert methods of control or vengeance.[21] It is possible that both genders in this study experienced similar exposure to environmental triggers and social stressors, contributing to comparable aggression profiles.

Age was another key demographic variable, with a mean of 16.54 years. Regression analysis revealed that age had the strongest negative association with aggressive behaviour among adolescents (B = -1.417, p< 0.001), indicating that younger adolescents exhibited higher levels of aggression. These results support the developmental psychology literature, which suggests that emotional regulation, impulse control, and cognitive maturity improve with age, leading to a reduction in reactive behaviors in older teens.[22–24] Moreover, these earlier studies support the statement that physical aggression peaks in early childhood and declines steadily during adolescence. The negative age-aggression association is consistent with the maturation of the prefrontal cortex and the improvement of top-down control during mid-to-late adolescence. Younger students (≈approximately 12–14 years old) typically exhibit higher impulsivity and sensitivity to peer status threats, predisposing them to reactive aggression. In contrast, older adolescents (≈approximately 16–18 years old) tend to display better future-oriented reasoning and conflict resolution. The persistence of hostility—an internalized, cognitive-affective stance (mistrust, resentment)—despite reduced overt behaviors indicates that cognitive schemas and attributional styles may be slower to change than observable acts, often requiring longer, reflective psychosocial work.[25,26]

The mean total aggression score across all participants was 82.43, placing them in the "average" aggression category based on the Buss–Perry Aggression Scale. However, the analysis of the aggression subscales revealed important differences. Specifically, anger was the most dominant aspect in both groups, yet hostility emerged as the most dominant trait overall. Hostility, being a more internalized form of aggression, may persist even as observable behaviors (e.g., physical aggression) are reduced

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through intervention. Interestingly, the item-level analysis showed that the statement "If somebody hits me, I hit back" had the highest average score (x = 3.84), highlighting the persistence of retaliatory thinking and reactive aggression among adolescents.

Animated narratives that depict the consequences of aggression and model prosocial alternatives can disrupt aggressive scripts, reduce normative beliefs that approve of retaliation, and increase self-efficacy for non-violent problem-solving.[8] The significant posttest reductions in the intervention group and the salience of the “hit-back” item suggest the videos likely operated by recalibrating normative acceptability and outcome expectancies (GAM pathways: cognition, affect, arousal).

This finding suggests that while animated media can effectively decrease external aggression, deeper emotional issues may require more sustained psychosocial support.[27] While many school-based interventions focus on reducing overt aggressive behaviors, deeper emotional components such as mistrust, resentment, and vengefulness often remain unaddressed. These internalized emotions, which may stem from past trauma, chronic stress, or social exclusion, can significantly influence an adolescent's behavior and worldview.[28,29] Addressing them requires more than short-term lessons or behavior management strategies—it demands sustained psychosocial support. This support may include ongoing counseling, trauma-informed care, and safe spaces for reflection and dialogue, guided by trained mental health professionals. Without targeted efforts to process and heal these underlying emotional wounds, aggressive tendencies may persist or re-emerge in subtler but still harmful forms.

The findings revealed a statistically significant reduction in aggression scores in the intervention group, while no significant change was observed in the control group. These results support the hypothesis that animated video media can serve as an effective educational and behavioral intervention tool for adolescents. The decrease in aggression, particularly in the intervention group, aligns with previous studies highlighting the role of media-based learning in shaping attitudes and behaviors.[13,14] The immersive and emotionally engaging nature of animated videos may have contributed to increased awareness, empathy, and self-reflection among students regarding their aggressive behaviors.[30] By depicting real-life scenarios and consequences related to aggression, these videos likely facilitated the internalization of prosocial behavior and conflict resolution strategies.

Notably, the Wilcoxon test revealed a significant reduction in posttest aggression scores in the intervention group (p = 0.000), whereas the control group showed no meaningful change (p = 0.648). These findings reinforce the value of visual storytelling as an intervention tool, particularly when designed to resonate with adolescent experiences.[31] The regression analysis further highlighted several important predictors of aggression. Age showed the strongest negative association with aggression (β=-1.417, $p< 0.001$), suggesting that younger adolescents may be more vulnerable to aggressive tendencies and more responsive to intervention. This supports developmental theories that emphasize the importance of early behavioral interventions during critical stages of social and emotional development.[32]

Additionally, physical aggression (B 1.090), anger (β= 1.109), and hostility were significant positive predictors of overall aggression scores. The prominence of anger and physical aggression also emerged in item-level analyses, with statements like "If somebody hits me, I hit back" receiving the highest average score (mean = 3.84).

These findings align with research showing media-based, story-driven learning can shape adolescent attitudes and reduce overt aggressive behaviors by enhancing perspective-taking and problem-solving (e.g., prior educational media trials and school-based violence-prevention programs).[13,14,30,31] They also converge with evidence that

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male adolescents tend to display more physical aggression, whereas females more often express relational/indirect forms (e.g., gossip, exclusion)[3,16,18–20] Notably, our lack of significant gender differences ($p = 0.204$) is consistent with recent work emphasizing multidimensional aggression, where verbal and relational components attenuate traditional male–female contrasts. Finally, the age gradient we observed aligns with developmental data, which show that physical/reactive aggression peaks earlier and declines across adolescence as executive control and emotion regulation improve.[22–24]

This suggests that retaliatory behavior remains a prevalent and socially reinforced form of aggression in this population. Such behavior often arises in response to perceived threats or offenses, reflecting a broader cultural norm that legitimizes revenge as a form of justice. Individuals may feel justified in their actions when they observe similar behaviors being accepted or even encouraged by peers. Social reinforcement, including approval from one's community or group, further perpetuates this pattern. As a result, retaliation becomes a learned and normalized way of addressing conflict, often at the expense of more constructive and non-aggressive coping strategies.[33] Furthermore, the peer acceptance of aggression can promote such behavior through external control beliefs, where individuals internalize the idea that aggression is an acceptable means of conflict resolution. Additionally, cultural norms, such as those found in honor cultures, can activate a mindset that increases the likelihood of retaliation in response to perceived unfairness. These insights highlight the need for a greater emphasis on emotional regulation and impulse control within school-based mental health and educational programs.

Although the animated video intervention reduced total aggression, the hostility dimension remained the most dominant overall, as shown in the graphical data. This implies that while overt behaviors such as physical and verbal aggression may decrease, internalized aspects of aggression, such as resentment or suspicion, may be more persistent and require longer-term or more intensive intervention strategies.

From a community nursing perspective, these findings are especially relevant. School nurses, counselors, and health educators can incorporate animated videos as part of broader psychoeducational efforts to promote emotional health and reduce violence. The results also advocate for media literacy education, encouraging students to critically engage with content and reflect on its impact on their behavior.

While the study provides meaningful insights, several limitations should be acknowledged. The self-report nature of the data may have introduced bias due to social desirability or underreporting. Moreover, the study was conducted in two high schools in Bandung, Indonesia, which may affect the generalizability of the findings. Future research should explore longitudinal designs, include diverse school settings, and test other media types or combinations for enhanced behavioral impact.

The study employed a relatively short exposure to animated content. While sufficient to reduce overt behaviors, it may be inadequate to shift entrenched hostile attributions. Longer-term or booster sessions are likely necessary to consolidate cognitive change. Besides, participants came from two public senior high schools in the Bandung region. Cultural context, school climate, and curricular emphasis may limit the generalizability of findings to other regions, private schools, vocational tracks, or different cultural norms regarding retaliation.

CONCLUSION

In conclusion, this study demonstrates that the use of animated video media can significantly reduce aggressive behavior among adolescents. Educational media interventions, particularly those tailored to the developmental stage and emotional context of students, represent a promising and scalable strategy to address adolescent

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aggression. Schools should consider incorporating animated videos into health and counseling classes to help students better understand and manage their emotions, resolve conflicts peacefully, and avoid aggressive behavior. Combine universal media lessons with small-group counseling for students scoring high on hostility/anger. School nurses and counselors can deliver brief CBT-informed modules on trigger identification, urge surfing, and problem-solving. These videos can speak to kids in a way that feels familiar and engaging, especially for younger teens who often struggle the most with anger and frustration. Use short, serialized episodes that model de-escalation, perspective-taking, and restitution. Pair each episode with guided discussion and role-play to translate narratives into actionable skills.

Starting these lessons early—around junior high—can make a big difference before negative behaviors become habits. It is also important to go beyond just stopping fights; students need space to discuss feelings such as resentment, suspicion, or bottled-up anger. Involving school nurses and mental health professionals can make these programs even more supportive and effective. Further research could involve a longitudinal study (3–12 months) to identify the best dosage for reducing hostility. Additionally, replicating this study in different Indonesian provinces and various school types (private, vocational, and boarding schools) may help improve its external validity.

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