

The Relationship Between Executive Function and Bullying Behavior among Elementary School Students in Pekanbaru

Salsabila Putri^{1*}, Zetra Hainul Putra¹, Jesi Alexander Alim¹

Primary School Teacher Education Study Program, Faculty of Teacher Training and Education, Universitas Riau, Pekanbaru, Indonesia

*salsabila.putri3703@student.unri.ac.id

Article Info

Article history:

Received: July 23rd, 2026

Revised: July 30th, 2026

Accepted: August 5th, 2026

Keywords:

bullying behavior
elementary students
executive function
primary education

ABSTRACT

Bullying remains a common issue among elementary school students and has the potential to hinder their social, emotional, and academic development. One individual factor hypothesized to be linked to *bullying* behavior is *executive function*—a cognitive ability involved in impulse control, emotional regulation, and behavioral adjustment to environmental demands. This study aimed to analyze the relationship between executive function and bullying behavior among elementary school students in Pekanbaru City. A quantitative approach with a correlational design was employed. The sample consisted of 500 fifth- and sixth-grade students from three public elementary schools in Pekanbaru City, selected using purposive sampling. Data were collected using questionnaires on *executive function* and *bullying* behavior that met validity and reliability criteria. Data analysis involved descriptive statistics, followed by the *Mann–Whitney U* test and *Spearman's rho* correlation. The results indicated that the majority of students fell into the moderate category for both *executive function* (65.2%) and bullying behavior (60.2%). Furthermore, no significant relationship was found between *executive function* and involvement as either a perpetrator ($r = -0.029$; $p = 0.525$) or a victim ($r = -0.031$; $p = 0.493$) of bullying. These findings suggest that *bullying* behavior among elementary school students is likely influenced more by factors other than *executive function*, such as school climate, peers, and the role of teachers. Therefore, bullying prevention efforts require a comprehensive approach involving the entire school community.

This is an open access article under the [CC BY-NC-SA](#) license.



Corresponding Author:

Salsabila Putri

Primary School Teacher Education Study Program, Faculty of Teacher Training and Education, Universitas Riau, Pekanbaru 28293, Riau, Indonesia

Email : salsabila.putri3703@student.unri.ac.id

INTRODUCTION

Primary education plays a crucial role in shaping the academic, social, emotional, and character development of students. At this stage, students not only learn to read, write, calculate, and grasp subject matter but also learn to follow classroom rules, manage emotions, collaborate with peers, and align their behavior with the social norms of the school environment (Santrock, 2012; UNESCO, 2021). Consequently, primary education cannot be viewed merely as a process of knowledge transfer; it is also a process of shaping a child's behavior and social skills. In the context of primary teacher education, understanding student behavioral development is vital, as primary school teachers play a direct role in creating a classroom climate that is safe, supportive, and conducive to learning.

One social behavioral issue that frequently arises in primary school settings is bullying. Rigby. (2007) defines bullying as aggressive behavior that is intentional, repetitive, and involves a power imbalance between the perpetrator and the victim. This power imbalance may manifest as physical strength, social dominance, verbal ability, the number of friends, or a specific position within the peer group. Thus, bullying differs from ordinary conflict between students. Conflict generally arises from a relatively balanced difference in interests, whereas bullying involves elements of dominance and pressure that place the victim in a weaker position (Solberg & Olweus, 2003).

Bullying behavior can manifest in various forms, whether direct or indirect. Direct bullying may involve physical acts such as hitting, kicking, pushing, damaging a peer's belongings, or making direct threats. Verbal bullying can take the form of mocking, insulting, name-calling, humiliating, or using demeaning language. Meanwhile, indirect or relational bullying may involve ostracizing a peer, spreading rumors, manipulating friendships, or excluding specific students from their social groups (Rigby, 2007; Solberg & Olweus, 2003). At the elementary school level, bullying often manifests in daily activities within the classroom, on the school grounds, or during student interactions in play groups.

In practice, bullying in elementary schools is often not immediately recognized as a serious issue. Actions such as teasing, name-calling, ostracizing peers, or humiliating other students are sometimes dismissed as mere joking. This perspective warrants critical examination, as repetitive actions can create negative experiences for victims and foster an unhealthy classroom culture (Rigby, 2007). If such behavior goes unchecked, students may come to view verbal aggression, social exclusion, or dominance over peers as normal aspects of social interaction. In the elementary school context, this situation is a matter of significant concern, given the strategic role elementary teachers play in identifying, preventing, and addressing bullying behavior from an early stage (Solberg & Olweus, 2003).

Bullying affects not only the victim but also the perpetrator, witnesses, the classroom climate, and the quality of learning. Victims of bullying are at risk of experiencing anxiety, low self-esteem, social difficulties, psychological distress, and reduced engagement in academic activities (Magfirah & Rachmawati, 2017). Hysing et al. (2021) demonstrated that involvement in bullying is linked to mental health issues, sleep quality, and academic achievement. Idsoe et al. (2021) further explained that the experience of being bullied can be associated with trauma in children and adolescents. These impacts indicate that bullying is not merely a matter of student discipline but a fundamental educational issue linked to student well-being and the success of the learning process.

In the Indonesian context, school-based bullying remains a relevant issue for study. Defriyanto et al. (2024) explained that bullying in the school environment is a complex issue

involving various forms of behavior, contributing factors, and impacts on students. In the context of Pekanbaru, Septiani et al, (2025) found that bullying behavior both verbal and physical persists among elementary school students. These findings demonstrate that bullying is not limited to the adolescent or secondary school levels but also manifests among elementary school-aged children. This is important because elementary school students are still at a stage of cognitive, emotional, and social development that requires intensive guidance from teachers and the school environment.

Bullying behavior cannot be understood merely as an individual student's fault; it is also linked to the school climate, classroom interaction patterns, teacher supervision, peer norms, and the communication culture within the school environment. Bradshaw et al. (2021) emphasize that school safety must be built through a comprehensive school climate approach, encompassing positive social relationships, a sense of safety, school norms, and consistent prevention practices. Zynuddin et al. (2023) also demonstrate that school climate is associated with the development of students' non cognitive skills. Consequently, elementary schools need to create learning environments that are not solely oriented toward academic achievement but also foster prosocial behavior, empathy, a sense of security, and healthy relationships among students.

The role of elementary school teachers is crucial in the context of bullying prevention. Teachers are responsible not only for delivering instructional material but also for observing student social dynamics, managing classroom interactions, instilling empathy, and preventing aggressive behavior among students. O'Higgins Norman et al. (2022) assert that addressing bullying requires more than just individual responses or reactive measures taken after an incident occurs; it demands a more holistic educational approach. Gaffney et al. (2021) further indicate that school-based anti-bullying programs can reduce both the perpetration of and victimization by bullying when implemented systematically. Therefore, bullying prevention in elementary schools requires pedagogical strategies, the strengthening of classroom climate, the cultivation of positive behaviors, the supervision of student social interactions, and the involvement of the entire school community.

In addition to school environment factors, individual student factors also warrant examination. One such individual factor related to a student's ability to regulate behavior is executive function. Executive function refers to a set of cognitive abilities that help individuals control their thoughts, emotions, and actions to align with their goals and environmental demands. For elementary school students, executive functions play a role in helping children attend to teacher instructions, remember classroom rules, control impulses to act rashly, complete tasks, adapt to learning situations, and manage their responses when facing conflicts with peers.

Executive functions encompass several key aspects. Inhibition relates to the ability to suppress urges or impulsive responses. Working memory involves the capacity to store and utilize information in the short term to complete tasks. Emotional control pertains to the ability to regulate emotions so as not to react explosively in conflict situations. Planning and organization involve the ability to sequence steps, arrange activities, and complete tasks in a goal-oriented manner. Shifting relates to the ability to switch strategies or adapt to changing situations. Monitoring involves the ability to evaluate one's own behavior, while initiation relates to the ability to start actions or tasks independently (Gioia et al., 2016). Barkley. (2012) explains that executive functions help individuals think before acting, control impulses, and adjust their behavior to social demands.

In primary school education, executive functions play a crucial role as they are directly linked to students' readiness to engage in the learning process and interact in a healthy manner.

Students with strong executive functions tend to be better at following classroom rules, waiting their turn, completing tasks, understanding instructions, and controlling their reactions when facing disappointment or conflict. Conversely, students who struggle with executive functions may be more prone to impulsive actions, have difficulty controlling emotions, struggle to consider the consequences of their behavior, and face challenges in adapting to classroom social norms. It is within this context that executive functions become relevant to the study of bullying behavior.

Theoretically, executive functions may be linked to bullying behavior because bullying involves processes such as social decision-making, impulse control, emotional regulation, and an understanding of the consequences of one's actions. Students who struggle to inhibit aggressive impulses or regulate emotions may be more susceptible to engaging in behavior that harms their peers. On the other hand, students with weak executive functions may also struggle to assess social situations, defend themselves adaptively, or respond to peer pressure, making them more vulnerable to becoming victims. Therefore, executive functions are relevant not only for understanding students' academic performance but also for comprehending their social behavior within the primary school environment.

A number of previous studies indicate a link between executive functions and children's social behavior, including aggression, peer-related issues, and bullying. Jenkins et al. (2018) found that executive functions are associated with students' roles in bullying, whether as perpetrators or victims. Holmes et al. (2016) demonstrated a connection between executive functions and peer relationship difficulties spanning from childhood through adolescence. Medeiros et al. (2016) discovered that children involved in bullying situations exhibit specific executive function characteristics that can influence their social behavior. A recent study by Caetano et al. (2021) also highlights the link between executive functions and bullying, noting their role in behavioral control, emotional regulation, and social decision-making. Through a three-level meta-analysis, Jia et al. (2024) confirm that the relationship between school bullying and executive functions in children and adolescents remains a relevant topic for empirical investigation.

However, the relationship between executive functions and bullying behavior is complex. Bullying does not always stem solely from poor self-control or weak cognitive functioning in the individual. Wang and Chen. (2023) demonstrate that school bullying is influenced by factors at multiple levels, including both the individual and school levels. Consequently, within the field of Primary Teacher Education (PGSD), research on executive functions and bullying must be situated within the context of primary education rather than solely within cognitive psychology. Understanding executive functions is crucial due to their link to students' behavioral management, while bullying must be understood as a socio-pedagogical issue requiring the involvement of teachers, schools, and the learning environment.

While extensive research has been conducted on bullying among elementary school students, studies specifically linking executive function to bullying behavior within the context of primary education in Indonesia remain relatively limited. Most existing research focuses on the forms and impacts of bullying, school climate, parenting styles, or peer relationships. However, examining executive function is crucial, as it relates to students' ability to control their behavior and adapt to classroom norms. Furthermore, elementary school students possess developmental characteristics distinct from those of adolescents; thus, their involvement in bullying requires analysis that takes into account their self-regulation capacities and the school environment.

Based on this background, this study aims to analyze the relationship between executive function and bullying behavior among elementary school students in Pekanbaru City. The research questions addressed are: (1) what is the profile of executive function among elementary school students in Pekanbaru City?; (2) what is the profile of bullying behavior among elementary school students in Pekanbaru City? and (3) is there a relationship between executive function and bullying behavior among elementary school students in Pekanbaru City?

THEORETICAL FRAMEWORK

Executive Functions in the Context of Primary Education

Executive functions are a set of cognitive abilities that play a role in regulating an individual's thoughts, emotions, and behaviors to align with goals and environmental demands. In the context of primary education, executive functions are crucial as they relate to a student's ability to follow teacher instructions, sustain attention, control impulsive responses, complete tasks, regulate emotions, and adjust behavior during social interactions in the classroom. Gioia et al. (2016) explain that executive functions encompass several key aspects: inhibition, working memory, emotional control, planning, organization, shifting, monitoring, and initiation. These aspects assist children in organizing their actions, managing their behavior, and adapting their responses to both social and academic situations.

For primary school students, executive functions are not yet fully mature, as these abilities continue to develop alongside the child's cognitive, emotional, and social growth. Barkley (2012) emphasizes that executive functions relate to an individual's ability to think before acting, control impulses, and adjust behavior to meet environmental demands. In the primary school learning environment, these abilities are evident in how students wait for their turn, follow classroom rules, complete tasks in a goal-oriented manner, manage disappointment, and respond to conflicts with peers. Therefore, executive functions are relevant not only to academic achievement but also to the development of students' social behavior at school.

In the field of primary teacher education, understanding executive functions is important because primary school teachers work directly with students who are still in the developmental stage of self-regulation. Students with strong executive functions tend to be better at controlling impulses, considering the consequences of their behavior, and aligning their actions with classroom rules. Conversely, students facing challenges with executive functions may be more prone to impulsive behavior, struggle with emotional regulation, have difficulty considering consequences, and experience problems in social relationships. Thus, executive functions can be understood as an aspect of the individual that is potentially linked to students' social behavior in primary school.

Bullying Behavior Among Elementary School Students

Bullying is aggressive behavior that is intentional, repetitive, and involves a power imbalance between the perpetrator and the victim. This imbalance may stem from physical strength, social dominance, verbal ability, the number of friends, or a specific position within the peer group. Rigby. (2007) as well as Solberg and Olweus (2003) explain that bullying can manifest in both direct and indirect forms. Direct bullying involves physical and verbal actions, such as hitting, kicking, mocking, insulting, name-calling, or threatening. Meanwhile, indirect bullying can take the form of social exclusion, spreading rumors, manipulating friendships, or actions that cause a specific student to be rejected by the group.

At the elementary school level, bullying often arises during daily interactions among students. Actions such as teasing, humiliating a peer, taking belongings, ostracizing a student, or using derogatory nicknames are sometimes dismissed as mere joking. However, when such actions are repeated and place the victim under distress, the behavior can no longer be viewed as an ordinary conflict. In the context of primary education, bullying must be understood as a socio-pedagogical issue, as it impacts students' sense of safety, the classroom climate, peer relationships, and the quality of the learning process.

The impact of bullying on students extends beyond momentary emotional distress. Halliday et al. (2021) demonstrate that victimization through bullying can affect a child's psychosocial and academic development. Hysing et al. (2021) also found that involvement in bullying is linked to issues regarding mental health, sleep, and academic achievement. Furthermore, Idsoe et al. (2021) emphasize that the experience of being bullied can be associated with trauma. These findings indicate that bullying is a serious issue in primary education, as it can compromise student well-being and hinder their engagement in learning.

In the Indonesian context, school bullying remains a relevant issue for study. Defriyanto et al. (2024) explain that school bullying is a complex problem involving various forms of behavior, contributing factors, and impacts on students. Specifically in Pekanbaru, Septiani et al. (2025) found that bullying behavior persists among elementary school students, manifesting in both verbal and physical forms. This indicates that bullying is not merely an issue affecting adolescents or secondary school students but also appears among primary school-aged children. Consequently, research on bullying among elementary students is crucial for developing prevention strategies tailored to the characteristics of primary education.

The Relationship Between Executive Function and Bullying Behavior

Theoretically, executive function may be linked to bullying behavior because bullying involves processes such as impulse control, emotional regulation, social decision-making, and an understanding of the consequences of one's actions. Students with strong inhibition and emotional control capabilities tend to be better at restraining aggressive impulses, managing anger, and considering the impact of their behavior on others. Conversely, students with executive function deficits may struggle to control impulsive responses, interpret social situations, and regulate their emotions when facing peer conflicts. In this context, executive function can be viewed as an individual factor potentially associated with a student's involvement in bullying behavior.

Several previous studies support the existence of a link between executive function and children's social behavior. Jenkins et al. (2018) found that executive function is associated with students' roles in bullying, whether as perpetrators or victims. Holmes et al. (2016) demonstrated a relationship between executive function and peer relationship issues spanning from childhood through adolescence. Medeiros et al. (2016) also found that children involved in bullying situations exhibit specific executive function characteristics that can influence their social behavior. These findings indicate that executive function may be a crucial aspect in understanding students' social behavior.

Recent studies indicate that the relationship between executive functions and bullying remains an issue requiring further investigation. Through an integrative literature review, Caetano et al. (2021) demonstrated a link between executive functions and bullying, noting their association with behavioral control, emotional regulation, and social decision-making. A three-level meta-analysis by Jia et al. (2024) further confirmed that the relationship between school

bullying and executive functions in children and adolescents remains a relevant topic in the fields of child development and education. However, this relationship cannot always be understood in linear terms, as bullying is a phenomenon shaped by the interaction between individual and environmental factors.

In the context of primary schools, the relationship between executive functions and bullying requires careful analysis. Primary school-aged children are still undergoing cognitive and social development; consequently, their behavior is influenced not only by self-regulation abilities but also by peer pressure, classroom norms, teacher responses, and the school climate. Therefore, while executive functions are theoretically relevant to bullying, student involvement in bullying may not be fully explained by individual cognitive factors alone. It is crucial to consider this to avoid oversimplifying bullying as merely an issue of self-control.

School Climate, the Role of Teachers, and Bullying Prevention

Bullying in elementary schools cannot be separated from the context of the learning environment. Bradshaw et al. (2021) emphasize that school safety must be built through a comprehensive school climate approach, encompassing positive social relationships, a sense of security, shared norms, and consistent prevention practices. Zynuddin et al. (2023) also demonstrate that school climate is linked to the development of students' non-cognitive skills. Thus, a positive school environment can help students develop healthy social behaviors and reduce the risk of aggressive behavior emerging.

The role of elementary school teachers is crucial in shaping the classroom climate and preventing bullying. Teachers serve not only as instructors delivering subject matter but also as managers of student social interactions. They need to observe friendship dynamics, respond consistently to aggressive behavior, instill empathy, and establish clear classroom rules. O'Higgins Norman et al. (2022) assert that addressing bullying requires more than just responding to individual cases; it necessitates a more holistic educational approach. In other words, bullying prevention must be embedded in the school culture rather than serving merely as a reactive measure taken after a problem has occurred.

The effectiveness of school-based approaches is also supported by Gaffney et al. (2021), who demonstrated that school-based anti-bullying programs can reduce both the perpetration of and victimization by bullying when implemented systematically. Such programs may encompass the reinforcement of classroom rules, empathy education, the fostering of prosocial behavior, the supervision of student interactions, and collaboration among teachers, schools, and parents. Within the context of Primary School Teacher Education (PGSD), these findings underscore the need to design bullying prevention strategies as an integral part of classroom management and character building for primary school students.

Furthermore, Wang and Chen. (2023) demonstrated that bullying can be influenced by factors operating at multiple levels specifically, the individual and school levels. This multilevel perspective is significant as it clarifies that bullying is not merely an issue concerning the individual student but is also linked to the social structure of the school. Consequently, research on executive function and bullying needs to be situated within a broader framework: the interaction between individual student factors and the primary education environment.

METHOD

This study employs a quantitative approach with a correlational design. A correlational design is used to examine the relationship between variables without administering specific

treatments or interventions to the participants (Creswell & Creswell, 2018). In this study, the correlational design is utilized to analyze the relationship between executive function and bullying behavior among elementary school students. Executive function is positioned as the predictor variable, while bullying behavior—encompassing students' involvement as either perpetrators or victims—is positioned as the criterion variable. This design choice aligns with the study's objective, which is not to establish a causal relationship but rather to examine the presence or absence of a statistical relationship between the variables based on empirical data.

The selection of fifth- and sixth-grade students is based on the consideration that students at this level possess the ability to comprehend reading materials, independently interpret written instructions, and respond to questionnaire items in a more objective and adequate manner. Details regarding the objective selection process and the demographic characteristics of the final sample are comprehensively presented in the following table:

Table 1. Exclusion criteria and demographic characteristics of the study sample

Sample Characteristic	Amount (N)	Percentage (%)
Respondent Selection Stages		
Initial number of questionnaires distributed	530	100%
Respondents eliminated (incomplete data/did not meet criteria)	30	5,66%
Final eligible sample	500	94,34%
Gender Distribution (Final Sample)		
Male student	238	47,60%
Female student	262	52,40%
Total research sample	500	100%

Based on the data in the table above, it can be identified that out of an initial total of 530 participating students, 30 questionnaires were disqualified or eliminated due to incomplete data or failure to meet the study's inclusion criteria. Consequently, the final sample statistically analyzed consisted of 500 respondents, with a balanced proportion of male (47.60%) and female (52.40%) students.

Data were collected using a questionnaire employing a four-point Likert scale. Likert scales are widely used in quantitative research to measure respondents' attitudes, perceptions, experiences, or behavioral tendencies regarding specific statements (Creswell & Creswell, 2018). The executive function instrument initially comprised 32 items. Following validity testing, 16 items were deemed valid and used in the primary analysis. The instrument achieved a Cronbach's Alpha reliability coefficient of 0.809. Reliability values above 0.70 are generally considered adequate to demonstrate the instrument's internal consistency in social and educational research (Field, 2018; Pallant, 2020). Thus, the executive function instrument is considered to possess good internal consistency.

The bullying behavior instrument initially consisted of 16 items. After the validation process, 12 items were deemed valid, comprising 8 items measuring involvement as a perpetrator of bullying and 4 items measuring experiences as a victim of bullying. The reliability coefficient for the perpetrator subscale was 0.743, while the reliability for the victim subscale was 0.732. Both values indicate that the bullying behavior instrument possesses adequate internal consistency for use with elementary school students.

Prior to primary data collection, the research instrument underwent expert validation and a pilot test involving 30 students outside the actual research sample. This stage was conducted to

ensure the instrument's content validity, the readability of its items, and its suitability for use with elementary school students. Once the instrument was deemed suitable, data collection took place at the school with the assistance of school staff. Students were briefed on the research objectives, the procedure for completing the questionnaire, and the importance of providing answers that reflected their own circumstances and experiences. Following data collection, the researcher screened the data to verify response completeness, identity details, and data suitability prior to further analysis. Preliminary data screening is crucial for ensuring data quality before statistical analysis (Pallant, 2020).

Data analysis was performed using SPSS version 25. The first stage involved descriptive statistics to outline participant characteristics and the distribution of scores for executive function and bullying behavior. Descriptive statistics were used to present data trends via frequencies, percentages, means, standard deviations, medians, minimum values, and maximum values. The second stage involved a normality test using the One-Sample Kolmogorov-Smirnov test to determine whether the data met the assumption of a normal distribution. Normality testing is necessary because the choice of inferential statistical techniques depends on whether data distribution assumptions are met (Field, 2018; Pallant, 2020).

Based on the normality test results, the research data were not normally distributed; consequently, inferential analysis proceeded using non-parametric statistics. Differences in executive function and bullying behavior based on gender were analyzed using the Mann-Whitney U test. The Mann-Whitney U test is used to compare two independent groups when data do not meet the normality assumption (Field, 2018; Pallant, 2020). Subsequently, the relationship between executive function and bullying behavior was analyzed using Spearman's rho correlation. Spearman's rho is used to examine relationships between variables when data are ordinal or do not meet the normality assumption (Field, 2018). The significance level used in this study is 0.05.

When reporting results, the Mann-Whitney U test requires the inclusion of the U-value, Z-value, and p-value. Meanwhile, the Spearman correlation test requires reporting the correlation coefficient, the direction and strength of the relationship, and the p-value. Detailed statistical reporting is essential to ensure research results are transparent, open to critical evaluation, and compliant with international standards for scientific article reporting. This study adhered to ethical research principles regarding primary school-aged children. Data collection was conducted by safeguarding student anonymity and ensuring that the data obtained were used solely for academic purposes. As the participants were primary school students, the study was carried out with school authorization and teacher supervision during the administration of the instruments. Student responses were treated anonymously during the analysis and reporting of the research findings.

RESULTS

This study involved 500 fifth- and sixth-grade students from three public elementary schools in Pekanbaru City. In terms of gender, the participants consisted of 238 boys and 262 girls. The data analyzed had undergone a completeness check, following the exclusion of 30 out of the initial 530 responses that did not meet the analysis criteria.

Participant Characteristics

Table 2. Participant characteristics by gender

GENDER	AMOUNT (N)	PERCENTAGE (%)
MALE	238	47,6
FEMALE	262	52,4
TOTAL	500	100,0

The composition of participants indicates that the number of female students is slightly higher than that of male students. This difference in numbers is not substantial, meaning the gender distribution of participants is relatively balanced for further analysis.

Description of Students' Executive Functions

Descriptive analysis results indicate that the executive functions of elementary school students in Pekanbaru fall into the moderate category. Out of 500 students, 94 (18.8%) were in the low category, 326 (65.2%) were in the moderate category, and 80 (16.0%) were in the high category. These findings suggest that the majority of students possess self-regulation, impulse control, emotional regulation, and behavioral monitoring skills at an adequate level, though they do not predominantly fall into the high category.

Table 3. Categorization of students' executive functions

VARIABLE	VALUE RANGE	CATEGORY	AMOUNT(N)	PERCENTAGE (%)
EXECUTIVE FUNCTIONS	$X < 2,00$	Low	94	18,8
	$2,00 \leq X < 3,00$	Medium	326	65,2
	$X \geq 3,00$	High	80	16,0
TOTAL			500	100,0

Description of Student Bullying Behavior

Analysis of bullying behavior indicates that the majority of students fall into the moderate category. Specifically, 112 students (22.4%) are in the low category, 301 students (60.2%) are in the moderate category, and 87 students (17.4%) are in the high category. These results show that student involvement in bullying behavior remains prevalent to a significant degree, even though the majority do not fall into the high category.

Table 4. Categorization of student bullying behavior

VARIABLE	VALUE RANGE	CATEGORY	AMOUNT (N)	PERCENTAGE (%)
BULLYING BEHAVIOR	$X < 2,00$	Low	112	22,4
	$2,00 \leq X < 3,00$	Medium	301	60,2
	$X \geq 3,00$	High	87	17,4
TOTAL			500	100,0

These findings indicate that bullying remains a relevant issue in primary school settings. A "moderate" category should not be interpreted as a safe condition, as moderate-level involvement in bullying can still impact students' social relationships, sense of security, and learning comfort.

Descriptive Statistics of Research Variables

Table 5. Descriptive statistics of executive functions and bullying behavior

VARIABLE	N	MEDIAN	SD	MEAN	MINIMUM	MAXIMUM
EXECUTIVE FUNCTION	500	42	7.807	42,27	27	63
PERPETRATOR OF BULLYING	500	20	2.359	19,54	11	30
VICTIM OF BULLYING	500	10	1.613	10,27	4	15

Normality Test

A normality test was conducted to determine the appropriate inferential analysis technique. Based on the results of the One-Sample Kolmogorov–Smirnov test, the data on executive function and bullying behavior were not normally distributed, as the significance values were below 0.05. Therefore, the analysis proceeded using non-parametric statistics: the Mann–Whitney U test and Spearman’s rho correlation.

Table 6. Results of the research data normality test

VARIABLE	SIGNIFICANCE VALUE	INFORMATION
EXECUTIVE FUNCTION	$p < 0,05$	Abnormal
BULLYING BEHAVIOR	$p < 0,05$	Abnormal

Differences in Executive Function and Bullying Behavior Based on Gender

The Mann–Whitney U test was used to determine whether there were differences in executive function and bullying behavior between male and female students. The analysis results indicate no significant differences between male and female students regarding either executive function or bullying behavior. Thus, gender did not show a statistically significant difference regarding executive function and student involvement in bullying within this study's sample.

Table 7. Mann–Whitney U test results by gender

VARIABLE	KELOMPOK	N	MEAN RANK	U	Z	P	INFORMATION
EXECUTIVE FUNCTION	Male	238	253.46	30472.500	-0.438	0.662	not significant
	Female	262	247.81				
PERPETRATOR OF BULLYING	Male	238	244.02	29636.000	-0.967	0.333	not significant
	Female	262	256.39				
VICTIM OF BULLYING	Male	238	235.53	27374.500	-2.408	0.016	not significant
	Female	262	264.09				

The Relationship Between Executive Function and Bullying Behavior

Hypothesis testing was conducted using Spearman’s rho correlation because the data were not normally distributed. The analysis results indicate no significant relationship between executive function and students' involvement as perpetrators of bullying. Furthermore, there was no significant relationship between executive function and students' experiences as victims of bullying. These findings suggest that the level of students' executive function is not significantly associated with their involvement in bullying behavior within this study's sample.

DISCUSSION

This study aims to analyze the relationship between executive functions and bullying behavior among elementary school students in Pekanbaru. The results indicate that the majority of students (326 students or 65.2%) fall into the moderate category regarding executive functions. Meanwhile, 94 students (18.8%) are in the low category, and 80 students (16.0%) are in the high category. These findings suggest that while most students possess a satisfactory level of self-regulation ability, it is not yet fully optimal. In the context of primary education, this situation is understandable, as fifth and sixth-grade students are still undergoing continuous cognitive, social, and emotional development. This implies that their ability to control impulses, regulate emotions, plan actions, and monitor behavior still requires reinforcement through consistent learning processes and classroom management.

The finding that executive functions predominantly fall within the moderate category also indicates that elementary school students still rely significantly on teachers to guide their behavior. Executive functions encompass abilities such as inhibition, working memory, emotional control, planning, organization, shifting, monitoring, and initiation (Gioia et al. 2016). However, at the elementary school age, these abilities are still developing and are heavily influenced by the learning environment. Rigby. (2007) explains that executive functions assist individuals in organizing actions and adapting behavior to environmental demands. Therefore, the prevalence of the moderate category in this study suggests a need to strengthen students' executive functions through classroom routines, clear rules, practice in decision-making, and exercises in emotional control during daily school interactions.

The research results also indicate that the majority of students fall into the moderate category regarding bullying behaviour specifically, 301 students or 60.2%. Additionally, 112 students (22.4%) fall into the low category, while 87 students (17.4%) fall into the high category. These findings demonstrate that bullying behavior persists within the social interactions of elementary school students. Although the majority fall into the moderate category, this situation still warrants attention, as the moderate category cannot be interpreted as a safe condition. In the context of elementary schools, behaviors such as teasing, name-calling, ostracizing peers, humiliating others, or other aggressive acts can undermine students' sense of safety and the quality of classroom social relationships if they occur repeatedly.

The categorization of bullying reinforces the view that bullying is a genuine issue in primary education environments. Rigby, (2007) serta Solberg & Olweus, (2003) emphasize that bullying is a form of repetitive aggressive behavior involving a power imbalance between the perpetrator and the victim. Consequently, the finding that 60.2% of students fall into the moderate category and 17.4% into the high category highlights the need for serious attention from teachers and schools. Within the field of Primary Teacher Education (PGSD), these results are significant because elementary school teachers are responsible not only for academic achievement but also for shaping social behavior, fostering a positive classroom climate, and ensuring students' sense of safety during the learning process.

Normality test results indicate that the data regarding executive function and bullying behavior are not normally distributed; therefore, the analysis proceeded using non-parametric statistics. The use of the Mann–Whitney U test and Spearman's rho in this study is appropriate given that the data did not meet the assumption of normality. This demonstrates that the choice of analytical techniques was aligned with the data's characteristics. In international scholarly articles, the alignment between data characteristics and analytical techniques is a crucial aspect, as it influences the validity of the interpretation of the results.

The Mann–Whitney U test results indicate no significant difference between male and female students regarding executive function or bullying behavior. These findings suggest that, within this study's sample, gender is not a strong differentiating factor for executive function abilities or student involvement in bullying. In other words, male and female students exhibit relatively similar tendencies regarding self regulation and engagement in bullying behavior. However, these results do not imply that the forms of bullying experienced or perpetrated by male and female students are identical. Gender differences might become more apparent if bullying is analyzed based on specific forms, such as physical, verbal, social, or relational bullying.

The absence of gender based differences can also be understood within the context of evolving social interaction patterns among elementary school students. In the school environment, both male and female students engage in group interactions, social competition, verbal teasing, social exclusion, and friendship conflicts. Consequently, involvement in bullying cannot always be explained solely by gender. These findings imply that bullying prevention programs in elementary schools should not target specific student groups but rather encompass all students through classroom and school wide approaches.

The study's primary finding indicates no significant relationship between executive function and bullying behavior among elementary school students in Pekanbaru. This means that a student's level of executive function is not statistically linked to their involvement in bullying, whether as a perpetrator or a victim. Thus, the hypothesis positing a relationship between executive function and bullying behavior is not supported by the study's data. These findings are significant as they demonstrate that bullying behavior among elementary school students cannot be adequately explained by individual cognitive factors alone.

These non-significant results require cautious interpretation. The findings do not imply that executive function is unimportant for students' behavioral development. Executive function remains relevant, as it relates to a student's ability to control impulses, regulate emotions, monitor actions, and adapt behavior to social situations. However, based on this study's results, executive function did not emerge as a factor directly associated with bullying behavior. This suggests that student involvement in bullying is likely more complex and may be influenced by factors not measured in this study such as school climate, peer influence, parenting styles, teacher supervision, classroom norms, and the school's communication culture.

These findings differ from several previous studies that identified a link between executive function and bullying. Jenkins et al. (2018) found that executive function is associated with students' roles in bullying, whether as perpetrators or victims. Holmes et al. (2016) also demonstrated a relationship between executive function and peer relationship issues from childhood through adolescence. Medeiros et al. (2016) discovered that children involved in bullying situations exhibit specific executive function characteristics that can influence their social behavior. Research by Caetano et al. (2021) and Jia et al. (2024) further indicates that the relationship between executive function and bullying remains a significant topic in the fields of education and child development. These divergent results may stem from differences in participant age, school context, measurement instruments, and the social factors accompanying bullying behavior.

One possible explanation for the non-significant results lies in the characteristics of the study participants. This study involved fifth- and sixth-grade elementary school students who are still undergoing cognitive and social development. At this stage, student behavior is shaped not only by self-regulation abilities but also significantly by classroom dynamics, peer pressure,

group norms, and teacher responses to aggressive behavior. Consequently, even if students possess moderate executive function, this does not necessarily correlate directly with low or high levels of involvement in bullying. In the context of primary education, students' social behavior is often shaped by the interplay between individual capabilities and the learning environment.

A second possibility is that bullying is a socio-pedagogical phenomenon influenced by school climate and group norms. Bradshaw et al. (2021) emphasize that school safety must be fostered through a comprehensive approach to school climate, encompassing positive social relationships, a sense of security, shared norms, and consistent prevention practices. Zynuddin et al. (2023) also demonstrate a link between school climate and the development of students' non-cognitive skills. Thus, students with adequate executive function may still engage in bullying if they are situated in a classroom environment that normalizes teasing, social exclusion, peer dominance, or inconsistent responses to aggressive behavior.

A third possibility involves multilevel factors that were not measured in this study. Wang and Chen. (2023) indicate that bullying can be influenced by factors at both the individual and school levels. While this study examined executive function and bullying behavior, factors such as school climate, teacher-student relationships, peer influence, parenting styles, empathy, and classroom culture were not directly analyzed. Therefore, the non-significant results may suggest that the relationship between executive function and bullying is not direct but is instead influenced by specific mediating or moderating variables. This presents a significant opportunity for future research.

The study results indicate that executive function does not have a significant relationship with bullying behavior among elementary school students in Pekanbaru City. These findings suggest that students' involvement in bullying is likely influenced not only by self-regulation abilities an individual factor—but also by various other factors not measured in this study. Such factors include school climate, peer relationships, parenting styles, teacher supervision, classroom norms, and the culture of interaction within the school environment. Consequently, bullying behavior should be understood as a multidimensional phenomenon; explaining it based on a single individual factor is insufficient, and instead, it requires an analysis that considers the interaction between individual and environmental factors (Bradshaw et al., 2021; Wang & Chen, 2023).

The results should also be interpreted with the characteristics of the research instrument in mind. This study employed a self-report questionnaire; thus, students' responses depended on their understanding of the statements, their ability to recall experiences, and their willingness to answer honestly. Regarding sensitive issues like bullying, students might downplay their behavior, fail to recognize that certain actions constitute bullying, or feel uncomfortable admitting to involvement as either a perpetrator or a victim. These factors can influence score variability and weaken the statistical relationships between variables. Therefore, future research should consider utilizing additional methods, such as classroom observations, teacher interviews, peer nominations, or teacher reports.

In the field of primary teacher education, these research findings carry significant practical implications. Since executive function is not significantly associated with bullying behavior, bullying prevention strategies should not focus solely on strengthening individual students' self-regulation. Primary school teachers need to foster a positive classroom climate, establish consistent rules, monitor student interactions, encourage positive communication, and cultivate empathy. O'Higgins Norman et al. (2022) emphasize that addressing bullying requires a holistic educational approach rather than merely reacting to specific incidents. Similarly, Gaffney et al.

(2021) demonstrate that school-based anti-bullying programs can reduce both the perpetration of and victimization by bullying when implemented systematically.

Based on the study's findings, bullying prevention efforts in primary schools require a comprehensive approach that engages the entire school community. Teachers play a pivotal role in creating a positive classroom climate, setting consistent rules, supervising student interactions, instilling empathy, and fostering prosocial behavior during learning activities. Furthermore, collaboration between schools and parents must be strengthened to ensure the continuous guidance of student behavior. Such an approach aims to create a safe learning environment, improve the quality of social relationships among students, and mitigate the risk of bullying in primary schools (O'Higgins Norman et al., 2022; Gaffney et al., 2021).

The primary contribution of this study lies in the finding that executive function is not significantly linked to bullying behavior among primary school students within the scope of this research. This finding suggests that bullying in primary schools cannot be adequately explained by individual cognitive factors alone. From the perspective of primary teacher education, bullying should be understood as a socio-pedagogical issue involving classroom management, school climate, peer norms, and the teacher's role in shaping a culture of healthy interaction. Consequently, bullying prevention strategies must extend beyond a focus on students' self-regulation skills to address the structures of social interaction and classroom culture.

Nevertheless, this study has several limitations. First, the research was conducted at only three public elementary schools in Pekanbaru City; therefore, the findings cannot be broadly generalized to all elementary school students in Indonesia. Second, the study employed a correlational design, meaning it could not establish a causal relationship between executive function and bullying behavior. Third, data were collected using self-report questionnaires, introducing the possibility of response bias. Fourth, the study did not measure environmental variables such as school climate, peer influence, teacher-student relationships, parenting styles, and classroom culture even though these factors may play a significant role in explaining bullying behavior.

CONCLUSION

This study aimed to analyze the relationship between executive function and bullying behavior among elementary school students in Pekanbaru City. The results indicate that the majority of students fell into the moderate category for both executive function levels and bullying behavior. These findings suggest that while students' self-regulation abilities have developed to a reasonably good level, bullying behavior is still present in student interactions, albeit not at a high level.

Spearman correlation test results showed no significant relationship between executive function and bullying behavior whether as a perpetrator or a victim. Consequently, the hypothesis positing a relationship between the two variables was not supported. These findings indicate that student involvement in bullying behavior is not solely determined by executive function; other factors likely play a role, such as school climate, peer relationships, parenting styles, and the teacher's role in fostering a safe and conducive learning environment.

Based on these findings, schools are encouraged to continue developing bullying prevention programs by strengthening character education, enhancing student supervision and guidance, and fostering ongoing collaboration among schools, parents, and the community. Future research should examine other potential influences on bullying behavior such as empathy, emotional regulation, parenting styles, peer support, and school climate to gain a more

comprehensive understanding of the factors contributing to bullying behavior among elementary school students.

REFERENCES

- Barkley, R. A. (2012). *Executive Functions: What They Are, How They Work, and Why They Evolved* - Russell A. Barkley - Google Books.
- Bradshaw, C. P., Cohen, J., Espelage, D. L., & Nation, M. (2021). Addressing School Safety Through Comprehensive School Climate Approaches. *School Psychology Review*, 50(2–3), 221–236. <https://doi.org/10.1080/2372966X.2021.1926321>
- Caetano, L. A. O., de Oliveira, W. A., do Nascimento, L. C. G., Manochio-Pina, M. G., Ramos, S. B., & da Silva, J. L. (2021). Relationship between executive functions and bullying: An integrative literature review. *Psicologia: Teoria e Prática*, 23(2), 1–23. <https://doi.org/10.5935/1980-6906/ePTPPE12854>
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications, Inc.
- Defriyanto, Mulawarman, Haryono, & Sunawan. (2024). In-Depth Understanding of Bullying in Schools: A Systematic Literature. *KONSELI: Jurnal Bimbingan dan Konseling (E-Journal)*, 11(2), 227–236. <https://doi.org/10.24042/kons.v11i2.23252>
- Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics* (5th ed.). SAGE Publications Ltd.
- Gaffney, H., Ttofi, M. M., & Farrington, D. P. (2021). Effectiveness of school-based programs to reduce bullying perpetration and victimization: An updated systematic review and meta-analysis. *Campbell Systematic Reviews*, 17(2). <https://doi.org/10.1002/cl2.1143>
- Gioia, G. G., Isquith, P. K., Retzlaff, P. D., & Espy, K. A. (2002). *DigitalCommons @ University of Nebraska - Lincoln Confirmatory factor analysis of the Behavior Rating Inventory of Executive Function (BRIEF) in a clinical sample*.
- Halliday, S., Gregory, T., Taylor, A., Digenis, C., & Turnbull, D. (2021). The Impact of Bullying Victimization in Early Adolescence on Subsequent Psychosocial and Academic Outcomes across the Adolescent Period: A Systematic Review. *Journal of School Violence*, 20(3), 351–373. <https://doi.org/10.1080/15388220.2021.1913598>
- Holmes, C. J., Kim-Spoon, J., & Deater-Deckard, K. (2016). Linking Executive Function and Peer Problems from Early Childhood Through Middle Adolescence. *Journal of Abnormal Child Psychology*, 44(1), 31–42. <https://doi.org/10.1007/s10802-015-0044-5>
- Hysing, M., Askeland, K. G., Stormark, K. M., Bøe, T., & Sivertsen, B. (2021). Sleep and academic performance in school-aged children: Results from the Bergen Child Study. *Frontiers in Psychology*, 12, 1–10. <https://doi.org/10.3389/fpsyg.2021.640740>
- Idsoe, T., Vaillancourt, T., Dyregrov, A., Hagen, K. A., Ogden, T., & Nærde, A. (2021). Bullying Victimization and Trauma. *Frontiers in Psychiatry*, 11. <https://doi.org/10.3389/fpsyg.2020.480353>
- Jenkins, L. N., Tennant, J. E., & Demaray, M. K. (2018). Executive functioning and bullying participant roles: Differences for boys and girls. *Journal of School Violence*, 17(4), 521–537. <https://doi.org/10.1080/15388220.2018.1453822>
- Jia, W., Huang, C., Hu, N., & Cai, D. (2024). The association between school bullying and executive functions in children and adolescents: A three-level meta-analysis. *Journal of Adolescence*, 96(8), 1713–1726. <https://doi.org/10.1002/jad.12397>
- Magfirah, U., & Rachmawati, M. A. (2017). Hubungan antara Iklim Sekolah dengan

- Kecenderungan Perilaku Bullying. *Universitas Islam Indonesia*, 1–10.
- Medeiros, W., Torro-Alves, N., Malloy-Diniz, L. F., & Minervino, C. M. (2016). Executive functions in children who experience bullying situations. *Frontiers in Psychology*, 7(AUG), 1–9. <https://doi.org/10.3389/fpsyg.2016.01197>
- O'Higgins Norman, J., Berger, C., Yoneyama, S., & Cross, D. (2022). School bullying: Moving beyond a single school response to a whole education approach. *Pastoral Care in Education*, 44(3), 328–341. <https://doi.org/10.1080/02643944.2022.2095419>
- Pallant, J. (2020). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS* (7th ed.). McGraw-Hill Education.
- Rigby, K. (2007). Bullying in Schools: and what to do about it. *National Library Of Australia*, 22, 1–330.
- Septiani, F., Erlisnawati, E., & Marhadi, H. (2025). Analisis Perilaku Bullying Siswa Sekolah Dasar Negeri 164 Pekanbaru. *Journal of Education Technology Information Social Sciences and Health*, 4(1), 69–74. <https://doi.org/10.57235/jetish.v4i1.3682>
- Solberg, M. E., & Olweus, D. (2003). Prevalence Estimation of School Bullying with the Olweus Bully/Victim Questionnaire. *Aggressive Behavior*, 29(3), 239–268. <https://doi.org/10.1002/ab.10047>
- UNESCO. (2021). *Reimagining Our Futures Together: A New Social Contract for Education*.
- Wang, Y.-J., & Chen, I.-H. (2023). A Multilevel Analysis of Factors Influencing School Bullying in 15-Year-Old Students. *Children*, 10(4). <https://doi.org/10.3390/children10040653>
- Zynuddin, S. N., Kenayathulla, H. B., & Sumintono, B. (2023). The relationship between school climate and students' non-cognitive skills: A systematic literature review. *Heliyon*, 9(4). <https://doi.org/10.1016/j.heliyon.2023.e14773>