

Understanding how fatherless shapes cognitive processes in adolescents

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Abstract

The family plays a crucial role in a child's development, particularly the presence of a father who provides emotional and cognitive support. The increasing prevalence of fatherless, or the absence of a father figure, raises concerns regarding its potential association with adolescents cognitive processes. This study aims to examine the relationship between fatherless and the cognitive processes of adolescents. The research sample consisted of 488 participants aged 15 to 20 years. Two measurement scales were used: the Fatherless Scale comprising 19 items (α 0.905) and the Cognitive Process Scale comprising 12 items (α 0.805). Hypothesis testing was conducted using the non-parametric Spearman's Rho analysis, which yielded a correlation coefficient of 0.319 with a significance value of 0.000 (<0.05), indicating a positive and significant relationship between fatherless and cognitive processes. These findings highlight an association between fatherless conditions and adolescents' cognitive processes; however, the results do not imply causality and should be interpreted within the limitations of correlational research.

Keywords

Adolescents, Cognitive processes, Fatherless

Introduction

Cognitive processes are mental processes related to how individuals receive, process, understand, and use information in daily life, including the ability to think, make decisions, evaluate oneself, and understand experiences [1]. According to Piaget, adolescence is a period of very important developmental tasks, namely the development of cognitive abilities. At this stage, adolescents begin to learn how to think, evaluate, and understand information. Adolescents also begin to be able to think more abstractly and see problems from various perspectives [2]. However, even if adolescents' thinking skills develop, these skills are not yet fully mature. This is because the part of the brain that regulates decision-making and self-control, namely the prefrontal cortex, is still developing during adolescence. As a result, adolescents often

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act impulsively, are easily influenced by their emotions, and are not yet able to assess risks properly. This condition is normal and will improve with age and brain development [3].

Cognitive processes themselves are very important because they relate to adolescents' ability to remember, judge right and wrong, solve problems, and control themselves [4]. Their unpreparedness in the way they think often makes teenagers struggle when they have to solve a problem. They tend to be confused, rush, or follow their friends' suggestions without considering what is actually happening. In late adolescence, critical thinking skills are actually better, but they can still misread situations. This is often influenced by unstable emotions, pressure from their surroundings, or social situations that make it difficult for them to think clearly [2]. Therefore, adolescence is a very important period for helping them develop cognitive abilities so that they can make wiser decisions.

Based on preliminary studies conducted by researchers, three adolescents aged 15–17 years were found to have difficulties in thinking and self-regulation. The first adolescent was SA, a 17-year-old female. SA had difficulty solving problems and making decisions independently. This condition meant that SA often needed help from others to make choices. In addition, SA also finds it difficult to focus when faced with problems, so she often feels confused about where to start. The second teenager is NK, aged 15. NK often has difficulty focusing and organizing her thoughts. When doing tasks, NK is easily distracted. In addition, NK also finds it difficult to resist the urge to do other more enjoyable things, such as checking her cell phone or chatting with friends, so the tasks at hand are often delayed. The third teenager is AFM, a 16-year-old male. AFM also has difficulty maintaining attention and concentration. He often finds it difficult to stay focused while doing tasks and organizing his thoughts properly. These findings indicate that teenagers aged 15–17 years can experience difficulties in thinking and self-regulation. These difficulties affect the way they learn, make decisions, and deal with daily activities.

The difficulties experienced by adolescents are closely related to cognitive processes, which underlie how they receive, process, and use information. These processes include attention, memory, comprehension, analysis, decision-making, and self-regulation [5]. According to Marzano and Kendall (2007), cognitive development progresses from the stage of information gathering and comprehension, to analysis and knowledge utilization, followed by metacognitive monitoring and self-systems related to motivation and beliefs [6]. Difficulties in concentration, self-control, and situational judgment may indicate impairments in these components, which affect adolescent learning and decision-making. Cognitive processes develop in a relational context, including parental involvement. Supportive father involvement through guidance, discussion, and emotional responsiveness contributes to cognitive regulation and higher-order thinking skills [7]. In this context, analyzing cognitive processes alongside

fatherless conditions is important for understanding how limited father involvement may be related to adolescents' cognitive functioning amid developmental demands.

Fatherless is a condition in which a child does not receive the optimal presence and role of a father in the parenting process, either because the father is not physically present or is not emotionally and psychologically involved in the child's life [8]. Previous research shows that environmental conditions, including father involvement, have a significant impact on children's cognitive development. Previous studies have found that the absence of a father figure or fatherless conditions can lead to loneliness, low self-esteem, and difficulty managing emotions [9]. Previous studies have also shown that fatherless adolescents tend to have lower subjective well-being, experience negative emotions more often, and are less motivated [10]. Meanwhile, other studies explain that fatherless can reduce children's emotional and spiritual intelligence, which then affects their ability to interact, empathize, and think critically in moral and religious contexts [7]. In addition to impacting emotional, social, and religious aspects, problems in cognitive processes also have the potential to increase adolescents' vulnerability to maladaptive behaviors, including hasty decision-making. Previous research on fatherless and cognitive processes in early marriage shows that adolescents who grow up without optimal father involvement tend to be weak in planning, self-evaluation, and cognitive control. This condition contributes to a low ability to consider the long-term consequences of decisions, including the decision to marry at an early age [11]. These findings show that the role of fathers is not only important in emotional aspects, but also in shaping children's ways of thinking.

Although the impact of fatherless has been widely discussed, most studies in Indonesia still focus on the emotional and social aspects of adolescents. Studies that specifically examine how fatherless affects cognitive processes are still very limited, even though cognitive processes include very important abilities such as attention, memory, comprehension, decision making, and problem solving [5]. In addition, neuroscience research shows that thinking skills are related to working memory, attention, and metacognitive functions, which can be impaired when children do not receive support from their fathers [12].

Therefore, this study is important because it offers a new perspective, namely looking at the impact of fatherless more specifically on the cognitive processes of adolescents. This study is expected to provide a more complete understanding of how fatherless affects the way adolescents think and learn, as well as provide input for the care and education of adolescents.

Method

This study used a quantitative method with a non-experimental design. This method was chosen because the study aimed to examine the effect of fatherless on cognitive processes without administering any treatment or conducting any experiments. Data were collected once through an online questionnaire.

The study was conducted online using Google Forms and involved 488 adolescents in Indonesia aged 15–20 years. Participants were required to be within this age range, willing to complete the questionnaire, and have experienced living with their biological father, whether he was still alive or had passed away due to separation, distance, or death. This experience was necessary to assess fatherless. There were no additional exclusion criteria beyond completing the questionnaire.

The sampling technique used was purposive sampling. This technique was applied because the study intentionally selected participants who met specific criteria, particularly the age range of 15–20 years and the experience of father presence or absence. The questionnaire link was distributed through social media platforms, allowing adolescents who met the criteria and voluntarily agreed to participate to complete the survey. Before completing the questionnaire, participants read an informed consent form explaining the research objectives, data confidentiality, and participant rights. Only those who agreed to the consent form were allowed to proceed with the questionnaire.

Data was collected using two psychological scales administered online via Google Forms. The first instrument was the Fatherless Scale adapted from the instrument used in a previous study [13]. The scale was developed to measure the physical and psychological absence of fathers across four dimensions: emotional absence, cognitive absence, behavioral absence, and intentional absence. The original version consisted of 20 items. Before being administered to Indonesian adolescents, the instrument was reviewed to ensure clarity and suitability for the current research context.

Internal consistency analysis showed a Cronbach's Alpha coefficient of 0.905, indicating high reliability. This coefficient reflects internal consistency rather than construct validity. During item analysis, one item (item 18) was removed due to a low corrected item–total correlation (below 0.30), suggesting insufficient alignment with the overall construct. The removal of this item improved the overall reliability coefficient. The final Indonesian version consisted of 19 items distributed across four dimensions.

The second measurement tool was the Cognitive Process Scale, adapted from a measurement tool used in a previous study [13]. This scale originally consisted of 14 items designed to assess adolescents' cognitive functions in four dimensions: planning and problem solving, self-reflection and self-evaluation, decision making, and cognitive control or inhibition. Before being used in this study, the measurement tool was reviewed to ensure its clarity and suitability for Indonesian participants.

Internal consistency analyzed using Cronbach's Alpha resulted in a coefficient of 0.805, indicating good reliability. Two items (items 13 and 14), which were included in the cognitive control/inhibition dimension, were removed because they showed low item–total correlations (below 0.30) and weakened the internal consistency of the scale. After their removal, the scale showed a more homogeneous structure. The final version consisted of 12 items across four dimensions.

Data analysis was conducted using the non-parametric Spearman's Rho correlation technique because the normality test results indicated that the data were not normally distributed. Statistical analysis was performed using SPSS software to conduct normality testing, descriptive statistics, and correlation analysis between the Fatherless and Cognitive Process variables. The correlation coefficient was used to determine the direction and strength of the relationship between the two variables.

Results and Discussion

Results

1. Participant Characteristics

A total of 488 adolescents participated in this study. The distribution of participants by gender showed that female participants slightly outnumbered male participants. Of the total sample, 264 participants (54.1%) were female and 224 participants (45.9%) were male. The detailed distribution is presented in [Table 1](#).

[Tabel 1](#). Distribution of participants by gender

Gender	Frequency	Percentage
Male	224	45.9%
Female	264	54.1%
Total	488	100%

Regarding age, participants ranged from 15 to 20 years. The majority of participants were between 15 and 17 years old, with 169 participants (36.6%) aged 15, 107 participants (21.9%) aged 16, and 85 participants (17.4%) aged 17. Participants aged 18 to 20 represented a smaller proportion of the sample. The complete age distribution is presented in [Table 2](#).

[Table 2](#). Distribution of participants by age

Age	Frequency	Percentage
15	169	36.6%
16	107	21.9%
17	85	17.4%
18	68	13.9%
19	27	5.5%
20	32	6.6%
Total	488	100%

2. Hypothesis Testing Results

Prior to hypothesis testing, a normality test was conducted using the Kolmogorov-Smirnov test to examine whether the data were normally distributed. The results showed that both the father absence variable ($p = 0.000$) and the cognitive process variable ($p = 0.001$) had significance values below 0.05, indicating that the data were not normally distributed. Therefore, a non-parametric correlation analysis using Spearman's Rho was applied.

The correlation analysis showed a Spearman's Rho coefficient of $r = 0.319$ with a significance value of $p = 0.000$ ($p < 0.05$). These results indicate a positive and statistically significant relationship between father absence and cognitive processes. However, based on generally accepted interpretation guidelines, the strength of the correlation can be categorized as weak. These findings indicate that although father absence is significantly related to cognitive process scores, the magnitude of the relationship is relatively limited.

Discussion

The results of the study show that fatherless has a positive effect on cognitive processes in adolescents. This means that adolescents who experience the absence of a father figure, both physically and emotionally, show higher cognitive responses in terms of thinking, processing information, and making decisions. However, this positive effect does not mean that fatherless has a good impact on adolescent development.

These results indicate that adolescents with higher levels of fatherless are more likely to develop certain thinking skills as a form of adjustment to their circumstances. The lack of guidance and involvement from their fathers may encourage adolescents to be more independent in solving problems, making their own decisions, and managing their behavior and emotions without direct support from their fathers. This higher cognitive response can be understood as a way for adolescents to survive in situations where they face limitations.

However, the results of this study are not entirely consistent with several previous studies that state that fatherless is associated with various cognitive problems, such as difficulty in decision making, low self-control, and obstacles in the ability to regulate thoughts and behavior [10]. These differences in results indicate that the impact of fatherless on cognitive processes can vary, depending on family support, social environment, and the demands faced by adolescents.

Previous research explains that fathers play an important role in the development of children's thinking, such as providing cognitive challenges, communication patterns, and encouragement to think rationally [7]. When fathers are absent, adolescents lose one of the important sources of stimulation and guidance in their cognitive development and decision-making. This fatherless condition can have various negative effects, such as identity crises, developmental disorders, and psychological problems that can continue into adulthood. In some cases, adolescents try to cope with this situation by relying more on themselves to solve problems and make decisions. However, this apparent independence is not an ideal developmental process, but rather a form of adaptation to the absence of the father's role, which forces adolescents to bear additional psychological burdens and responsibilities in their development process [14].

The thinking process is influenced by long-term memory, attention, and metacognition [12]. The absence of a father figure can affect adolescent development due to the

reduced role of fathers in providing guidance, direction, and involvement in daily life. In fatherless situations, some adolescents try to adapt to the circumstances, for example by becoming more independent and accustomed to making their own decisions. This adaptation is related to how adolescents evaluate their lives, particularly in assessing past experiences, current conditions, and expectations for the future. However, this ability emerges as a form of adjustment to the absence of the father's role, not as an ideal developmental condition, and is still accompanied by the emotional and psychological burdens experienced by adolescents [10].

Compared to previous studies, the results of this study show a different direction of relationship. Previous studies have stated that fatherless adolescents tend to experience problems with emotions, motivation, and self-regulation [10]. Other studies also show that fatherless can impact adolescents' social and emotional abilities, which in turn affects their thinking and problem-solving skills [9]. The difference in the direction of the relationship in this study shows that although fatherless is often associated with negative effects, under certain conditions adolescents can demonstrate higher cognitive responses as a form of self-adjustment.

The results of this study can also be understood by referring to previous studies that researched fatherless and cognitive processes in adolescents who married early. The study found that limitations in planning, decision-making, and cognitive control contribute to adolescents' tendency to make major decisions without careful consideration of the long-term consequences. In the context of early marriage, weak self-evaluation and impulse control processes are factors that increase the likelihood of adolescents making emotional or reactive decisions in response to social and environmental pressures [11].

In comparison with previous studies, the results of this study show a different direction of relationship. Previous studies have shown that fatherless adolescents tend to have difficulties in social behavior, such as understanding social situations and determining appropriate responses, which are related to how adolescents process information and make decisions [15]. Other studies have also found that fatherless is associated with increased aggressive behavior, which is linked to weak impulse and emotional control, as part of the cognitive process of assessing and controlling behavior [16].

Although fatherless is associated with adolescents' cognitive processes and behavior, the strength of this association does not stand alone. This shows that fatherless is not the only factor that influences the development of cognitive processes and delinquent tendencies in adolescents. Other factors such as the parenting style of the remaining parent, emotional support from the family, economic conditions, school environment, and peer influence also play a role in shaping adolescents' thinking and decision-making. Adolescents who experience fatherless but receive good emotional support still have the opportunity to develop adaptive cognitive processes, enabling them to control their behavior and avoid deviant actions. Conversely, adolescents who have a father but lack

emotional support and optimal parenting may experience obstacles in their thought processes, which ultimately increases the risk of engaging in delinquent behavior [17].

This study has several limitations that need to be considered. First, data collection was conducted online, so researchers could not control the situation when participants filled out the questionnaire. Second, the sampling technique used was stratified sampling, so it could not represent the entire population of Indonesian adolescents. Third, fatherless was measured based on self-perception, rather than interviews or assessments by other parties, so there is a possibility of bias in the assessment of the father's condition. Fourth, this study did not include other factors that may influence the cognitive process, such as the psychological condition of the participants, maternal parenting patterns, or stress levels within the family. These limitations mean that the results of this study cannot be generalized broadly and should be read with caution.

Nevertheless, this study contributes to psychological research by expanding the understanding of fatherless beyond emotional and behavioral impacts, highlighting its association with adolescents' cognitive processes. The findings suggest that family conditions, particularly the absence of a father, may influence how adolescents think and make decisions, which can ultimately shape their behavior. These results may inform educators, school counselors, and parents in designing appropriate psychological support, such as strengthening critical thinking, problem-solving skills, and family-based interventions [17].

Future research should employ more diverse and representative sampling techniques and consider mixed methods to gain deeper insight into fatherless adolescents' experiences. Additional variables such as coping strategies, social support, psychological well-being, and the quality of maternal relationships should also be explored to provide a more comprehensive understanding of adolescent cognitive development.

Conclusion

This study aims to determine the relationship between fatherless and cognitive processes in adolescents. The results show that there is a significant relationship between fatherless and cognitive processes. This means that the experiences of adolescents who grow up without a father are related to the way they think, process information, and make decisions. These findings indicate that adolescents who experience fatherless may exhibit different ways of thinking as a form of adjustment to their circumstances. However, these results do not mean that fatherless is a good or ideal condition for adolescent development. The results of the study only show a correlation, not a cause and effect relationship.

This study also shows that adolescents' thinking processes are not only influenced by the presence of their fathers, but also by other factors such as family support, school environment, and peers. Therefore, fatherless adolescents still need support from their

surroundings in order to develop properly. Overall, this study provides an overview that fatherless is related to the development of adolescents' cognitive processes. The results of this study are expected to be taken into consideration by parents, teachers, and counselors in providing appropriate guidance for adolescents, especially those who grow up without a father.

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