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The Correlation between Novice Psychopaths, Time Management, and False Feelings in Metacognition: The Mediating Role of Impulsive Behaviors

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Abstract

Background: *Hyperactivity disorder has become an insoluble problem for psychologists and psychiatrists, parents, and teachers. This study aimed to explore how impulsive behaviors mediate the relationship between time management and false feelings in consciousness or metacognition in novice psychopaths.*

Methods: *The current study is a descriptive-correlational research with a cross-sectional research design, utilizing structural equation modeling (SEM). The target population consists of all individuals who have sought treatment at psychological clinics in Tehran, with documented psychopathic disorders between July and December of 2023. The sample size included 198 individuals diagnosed with psychopathic disorder by expert psychologists within the past year. Participants were selected through purposive sampling. The research utilized the Barratt Impulsivity Scale (BIS), Time-Management Scale, and Metacognition Questionnaire-30 (MCQ-30) as measurement tools. Descriptive statistics were analyzed using SPSS version 27, while SmartPLS version 4 was used to examine path coefficients. A significant level was set at 0.05.*

Results: *Based on the findings from the study, it was revealed that the long-term planning aspect had a notable negative impact on both impulsive behaviors (β=-0.516, P-value<0.001) and negative beliefs (β=-0.674, P-value<0.001). Conversely, the short-term planning factor had a positive and significant influence on impulsive behaviors (β=0.293, P-value<0.001) and negative beliefs (β=0.214, P-value<0.001). Impulsive behaviors, acting as a mediating variable, showed no significant effect on negative beliefs (β=-0.017, P-value=0.772).*

Conclusions: *The findings of the current research indicate that long-term planning reduces impulsive behaviors and negative beliefs, but short-term planning has the opposite effect on novice psychopaths. Additionally, the study revealed that impulsive behaviors do not have a significant impact on negative beliefs when serving as a mediating variable.*

Keywords: Novice psychopaths, Time management, Metacognition, Impulsive behaviors.
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Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a long-term neurodevelopmental disorder distinguished by prominent clinical signs of inattention and hyperactivity/impulsivity. It is among the most prevalent psychiatric disorders in childhood, leading to various negative effects on clinical, academic, social, emotional, and functional aspects during adulthood[1]. The typical age for diagnosing the disease is during childhood, with a prevalence rate in the community ranging from 2% to 7%. However, in up to 65% of cases, the harmful symptoms of the disease continue into adulthood. People affected by the disease may exhibit deficiencies in executive functions such as motor inhibition, attention, and working memory[2]. Research findings indicated that the main symptoms of attention deficit hyperactivity disorder are inattention and hyperactivity/impulsivity. Impulsivity can manifest in different forms, including emotional impulsivity, a tendency towards uninhibited thoughts and actions influenced by emotions. These intense emotional states are linked to the duration of impulsive behavior, and these effects are observed in individuals with both internalizing and externalizing symptoms[3].

Impulsive and risky decision-making that peaks in adolescence is consistently associated with ADHD neurodevelopmental disorder, regardless of age[4]. Impulsivity is a multidimensional construct and can have five distinct dimensions: negative urgency, positive urgency, lack of forethought, lack of persistence, and sensation seeking[5]. Various signs of impulsivity such as excessive alcohol consumption, drug abuse, engaging in risky sexual behavior, compulsive eating, self-harm without suicidal intent, etc., can indicate behavioral problems[6]. A study focusing on impulsivity traits in ADHD found that impulsivity is a key characteristic of this disorder, with individuals with ADHD displaying the highest levels of impulsivity[7]. Dekkers et al. (2022) also concluded in their research that the presence of ADHD during adolescence exacerbates the tendency that already exists in adolescents to make impulsive and risky decisions [4]. Another study also indicated that children with attention deficit hyperactivity disorder have problems with working memory

and impulsivity[8]. Also, the research results of Linhartová et al., stated that patients with ADHD have an increase in impulsive performance and deficits in cognitive performance[9].

Young individuals with ADHD often struggle to manage their academic, social, daily life, and health/wellness needs, and also have challenges with planning and time management[10]. In individuals with hyperactivity, there is a notable difference in their perception of time. For instance, they may feel that time is passing more quickly, leading to difficulties with future time tasks and inaccuracies in estimating time. This is a common issue among those with hyperactivity[11]. A study found that individuals with ADHD struggle to accurately gauge time and distinguish between activities, leading to difficulties in completing tasks efficiently and effectively[12]. In another study, it was stated that children with ADHD have difficulty understanding time[13].

In addition to time management problems, various aspects of metacognitive deficits (eg, self-awareness) have been identified among children and young adults with ADHD[14]. Metacognition is the understanding and awareness of one's cognitive processes. It influences how individuals regulate their actions and can impact cognitive processing through control, monitoring, planning, and correction. When combined with emotional processing, metacognition can also play a role in mental health and susceptibility to mental disorders[15]. In this regard, the results of a study showed that patients with ADHD have worse metacognition scores in certain sub-dimensions than healthy people[14]. Also, in another study, it was stated that adults with ADHD may have deficits in metacognition[16]. According to Rahmani et al., study, recognizing conflicting schemas and having positive meta-cognitive and meta-emotional beliefs can enhance the symptoms of attention deficit hyperactivity disorder in adults[15].

Attention deficit hyperactivity disorder is linked to numerous challenges in areas such as education, interpersonal skills, and psychological well-being. The presence of fidgety and easily distracted behaviors poses a significant risk, as they are not merely outward manifestations of underlying issues[17]. Studying impulsive behaviors, time management, and metacognition in new psychopaths is crucial. Despite the lack of direct research on these components in this population, there is a significant gap in the literature. This study aims to explore the role of impulsive behaviors in new psychopaths and their connection to time management and metacognition. Next, the researcher drew the conceptual model of the research in Figure 1.

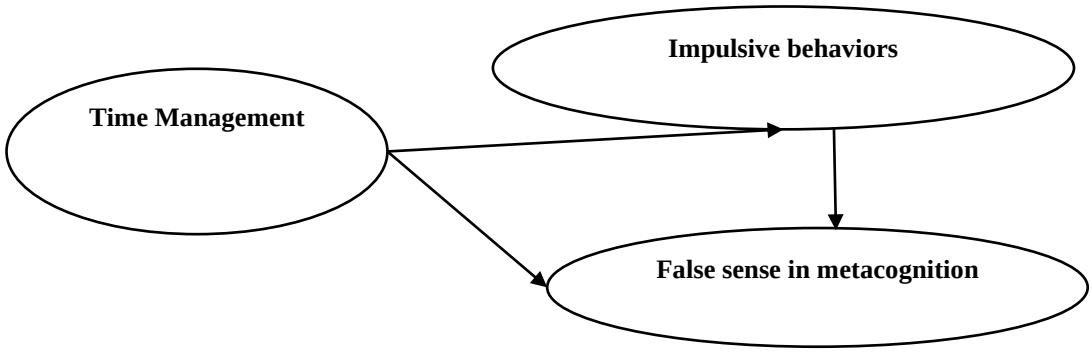

Figure 1. Conceptual framework of the research

Materials and Methods

The current study is descriptive-correlational research using a cross-sectional research method and Structural Equation Modeling (SEM). The research was conducted on all clients of psychological clinics in Tehran from July to December 2023 who had psychological records related to psychopathic disorder. A total of 198 men and women with psychopathic disorders were included in the study, confirmed by expert psychologists in the clinics based on DSM-5 criteria within a one-year diagnosis period. The purposive sampling method was used to select the sample. The sample size adequacy was determined using Cohen's formula in 2013 to calculate the sample size in SEM methods, considering the number of observed and latent variables in the model, anticipated effect size, desired probability, and statistical power level[18]. Based on this formula, the following were calculated to determine the sample size:

Anticipated effect size: 0.3

Desired statistical power level: 0.8

Number of latent variables: 4

Number of observed variables: 32

Probability level: 0.01

Based on the provided values, the researcher determined that 137 people would be needed for the study. In anticipation of potential high attrition rates, the researcher decided to aim for a sample size of 250 individuals to mitigate sample loss. This choice was influenced by the common occurrence of non-cooperation among individuals with psychopathic traits,

particularly during therapy sessions. To participate in the study, individuals had to possess a documented history of psychopath treatment, provide their informed consent, demonstrate adequate literacy and comprehension skills for answering survey questions, refrain from taking any medication for personality disorder treatment, and not have been diagnosed with the condition for more than a year. The individual displayed characteristics of a psychopath. The criteria for exclusion included being under the age of 20, having any physical or mental condition that hindered participation, failing to answer more than 5 questions in the surveys, using psychiatric medication, or dropping out of the study. The research was carried out in the following manner: Initially, approval was sought from the researcher's university to conduct the study, and subsequently, with assistance from university faculty, connections were made with 7 psychology and counseling clinics in Tehran. The clinic names were kept confidential to protect their identity. These specific clinics were selected for their convenience in coordinating research and potential collaboration with clients. Following visits to the clinics, the researcher coordinated with clinic management and client reception for research purposes. Subsequently, a message was sent on behalf of the psychology clinics to individuals with a psychology background, inviting them to participate in the research. Detailed information about the research, including objectives and ethical guidelines, was later shared with them through social media platforms. Individuals were informed that the research forms did not contain any personal information and they had the option to withdraw from the research. The online research process, which involved completing questionnaires, lasted six months due to limited client cooperation. Out of 250 filled questionnaires, only 198 were used for the study as 52 were excluded for incompleteness or deliberate errors. Self-report measures and HTML forms were used to assess impulsive behavior, time management, and metacognition among participants. Links to the measurement forms were distributed through social networks. The study adhered to ethical standards, and participants had the freedom to leave the study at any point.

Barratt impulsivity scale (BIS): The impulsive thoughts and behaviors questionnaire was developed in 1995 by Patton, Stanford, and Barratt to assess impulsivity[19]. The questionnaire consists of 30 items using a 4-point Likert scale ranging from 1 (never) to 4 (most of the time). There are three components in this questionnaire: unplanned impulsivity (questions 19, 13, 11, 10, 8, 5, 1, 22, 30), impulsive behaviors and movement impulsivity (questions 26, 28, 25, 24, 21, 18, 15, 14, 12, 9, 3, 2), and cognitive impulsivity (questions 4, 7, 6, 16, 17, 20, 23, 29, 27). The scores for these components range from 9 to 36, 12 to 48, and 9 to 36 respectively. Total scores on the scale range from 30 to 120. This study focused only on questions related to impulsive behaviors, where a higher score indicates more impulsive behaviors. In Iran, the Cronbach's alpha coefficient for this scale was found to be 0.90 after investigation [20]. In this research, the researcher obtained Cronbach's alpha coefficient of this scale equal to 0.963.

Time-Management scale: In 1996, Trueman and Hartley developed a self-report survey to assess time management behavior[21]. The survey consists of a 14-item Likert scale with 5 points ranging from never (score 1) to always (score 5). It is divided into two parts: short-term planning (5 questions), and long-term planning (9 questions). The total score ranges from 14 to 70, with higher scores indicating better time management in both the short and long-term. In a study conducted in Iran, Cronbach's alpha coefficient for this scale was determined to be 0.88[22]. In this research, the researcher found the Cronbach's alpha coefficient of this scale to be 0.88 in the short-term planning component and 0.954 in the long-term planning component.

Metacognition Questionnaire-30 (MCQ-30): The 30-item self-assessment tool created by Wells and Cartwright-Hatton in 2004 evaluates individuals' thoughts and beliefs[23]. In this study, responses were obtained using a four-point Likert scale (1: Strongly Disagree, 2: Somewhat Agree, 3: Agree, 4: Strongly Agree). The questionnaire includes 5 different sections focusing on various beliefs. These sections cover positive beliefs about worry (questions 28, 23, 19, 10, 7, 1), negative beliefs about controlling thoughts and associated risks (questions 21, 15, 11, 9, 4, 2), cognitive uncertainty (questions 29, 26, 24, 17, 14, 8), need for thought control (questions 27, 25, 22, 20, 13, 6), and metacognitive processes assessing self-awareness (questions 30, 18, 16, 12, 5, 3). For this research, only the questions related to negative beliefs about the controllability of thoughts were analyzed. The reliability of the entire scale was measured using Cronbach's alpha, which was found to be 0.91 in the Iranian sample[24]. In this research, the researcher obtained Cronbach's alpha coefficient of this scale equal to 0.893.

Descriptive statistics were performed using SPSS version 27 software, while SmartPLS version 4 software was utilized to analyze path coefficients between constructs. Additionally, Sobel's test was employed to determine the significance of the mediator variable. The normality of the distribution of research variables was assessed using the Kolmogorov-Smirnov test, which indicated a non-normal distribution for the research variables, leading to the use of SmartPLS. The sample size for implementing the structural equation model with the partial least squares method consisted of 198 individuals. A significance level of 0.05 was used for the analysis.

Results

At first, the researcher examined the descriptive statistics of the research variables. The participants were divided into three age groups: 20 to 30 years old (53.5%), 31 to 40 years old (27.3%), and 40 years old and above (19.2%). Likewise, the participants were divided into two groups, male (78.3%) and female (21.7%) (Table 1).

Table 2 displays the average and standard deviation of the research variables.

Table 3 based on the Pearson correlation coefficient, shows the correlation relationship between the research variables.

Based on the data in Table 3, it was found that the short-term planning aspect of the management variable was positively associated with the negative beliefs variable. However, the long-term planning aspect had a negative and

notable correlation with both the negative beliefs and impulsive behaviors variables (P-value<0.001). Following the analysis, the investigator examined the path coefficients and level of significance between the research variables as detailed in Table 4. For this study, the researcher chose to use a bootstrap value of 5000.

Based on the findings presented in Table 4 and Figure 2, it was found that the long-term planning component had a significant negative impact on impulsive behaviors (β=-0.516, P-value<0.001). Similarly, the long-term planning component was also found to have a significant negative effect on negative beliefs (β=-0.674, P-value<0.001). On the other hand, the short-term planning component was found to have a positive and significant impact on impulsive behaviors (β=0.293, P-value<0.001). Additionally, the short-term planning component was found to have a positive and significant effect on negative beliefs (β=0.214, P-value<0.001).

As a mediator variable, impulsive behaviors did not have a significant impact on negative beliefs (β=-0.017, P-value=0.772). Furthermore, the researcher utilized the Sobel test to confirm the significance of the mediating variable in the study. This test was performed using the specified formula.

$$Z - value = \frac{a * b}{\sqrt{(b^2 * s_a^2) + (a^2 * s_b^2) + (s_a^2 * s_b^2)}}$$

The mediator Z value for impulsive behaviors between long-term planning and negative beliefs variables was found to be 0.2929. The results of the Sobel test indicate that the mediating variable in the study is not statistically significant. The Z value for impulsive behaviors as a mediator between short-term planning and negative beliefs variables was calculated as -0.2924. Based on the Sobel test results, it can be inferred that the mediating variable is not significant in the research. The researcher assessed the reliability and validity of the research variables as shown in Table 5.

Table 5 clearly shows that the model's reliability and validity have been verified. The Cronbach's alpha reliability for the variables exceeds 0.7. The combined reliability of these variables also surpasses 0.7. The model's validity was assessed using the AVE index, which yielded a value higher than 0.5 for research variables, confirming the model's validity. The fit of the model was also analyzed by the researcher, with all fit indices being confirmed. The SRMR, or Standardized Root Mean Square Residual Index, indicates the difference between the observed correlation and the correlation matrix of the structural model. The SRMR value for the model was 0.188, and the NFI value was 0.688.

Table 1. Description of the demographic variables

Variables	Groups	Frequency	Percent	Sample size	Median
Gender	Boy	155	78.3	198	1
	Girl	43	21.7		
Age	20 to 30	106	53.5	198	1
	31 to 40	54	27.3		
	+40	38	19.2		

Table 2. Description of the main research variables

Variables	Mean±SD	Max	Min	N	Skewness	Kurtosis
Short-term planning	16.0404±4.651	21	7	198	-0.366	-1.343
Long-term planning	27.2727±8.822	40	11	198	-0.444	-1.035
Negative beliefs	72.197±19.329	104	48	198	0.417	-1.46
Impulsive behaviors	27.636±2.598	32	23	198	-0.203	-1.058

Table 3. Correlation between variables

Variables	1	2	3	4	P-value
Short-term planning	-				<0.001
Long-term planning	-0.464	-			<0.001
Negative beliefs	0.518	-0.762	-		<0.001
Impulsive behaviors	0.532	-0.652	0.537	-	<0.001

Table 4. Standard research coefficients in general

Result of the hypothesis	Path coefficient	STDEV	P-value	T-value	Result
Impulsive behaviors -> Negative beliefs	-0.017	0.058	0.772	0.29	**rejection**
Long-term planning -> Impulsive behaviors	-0.516	0.06	<0.001	8.67	**confirmation**
Long-term planning -> Negative beliefs	-0.674	0.063	<0.001	10.678	**confirmation**
Short-term planning -> Impulsive behaviors	0.293	0.067	<0.001	4.359	**confirmation**
Short-term planning -> Negative beliefs	0.214	0.049	<0.001	4.4	**confirmation**

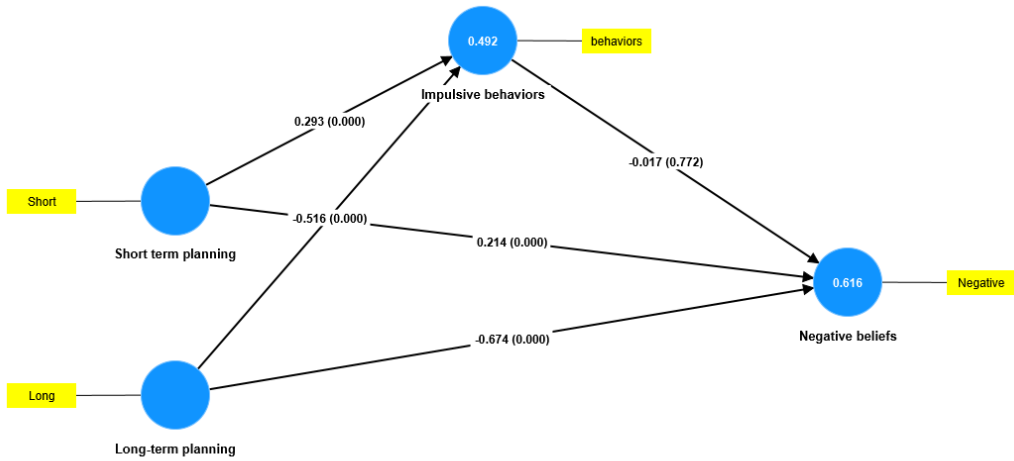

Figure 2. Path coefficients between variables and significance level

Table 5. Reliability and validity of the model

Variables	Cronbach's Alpha	Composite Reliability	Average variance extracted (AVE)
Short-term planning	0.88	0.901	0.55
Long-term planning	0.954	0.954	0.749
Negative beliefs	0.893	0.912	0.685
Impulsive behaviors	0.963	0.964	0.869

Discussion

The present study was conducted to investigate the mediating role of impulsive behaviors in novice psychopaths and its relationship with time management and false awareness or metacognition. Based on the results obtained from the current research, the long-term planning component had a significant negative impact on impulsive behaviors and negative beliefs. The short-term planning component also had a significant positive impact on negative beliefs and impulsive behaviors. However, the impulsive behavior variable as a mediating variable did not have a significant impact on negative beliefs. The findings of the present study demonstrated that the long-term planning component leads to a reduction in impulsive behaviors and negative beliefs, which is consistent with previous research[25-27]**.** Research has highlighted a direct correlation between reactive behaviors and executive functions during adolescence, where adolescents exhibiting reactive behaviors in executive functions such as inhibitory control, cognitive flexibility, and behavioral planning are prone to disorder[25.] In addition, a study aimed at investigating the relationship between impulsivity and maladaptive behaviors and the role of emotion regulation in adjustment showed that planning may reduce negative emotions in cases of self-harm and overeating[26] **.**A study also indicated that automatic thoughts, negative beliefs, and implicit biases lead to a lack of motivation and disruption in students' behavior, resulting in decreased learning outcomes, planning can help counteract these ineffective pattern[27]. In explaining this finding, it must be stated that at the cognitive level, it has been established that individuals with hyperactivity, despite the wide variety that defines developmental pathways, are generally impaired in executive functions. Hyperactivity can include various aspects of cognitive and motor impulsivity, involving non-reflective stimulus processes and manifesting itself through inhibitory problems, distractibility, and faster and less accurate responses to neuropsychological tests. Also, the presence of a certain slowness in the sensory-motor and cognitive processes of hyperactive individuals paves the way for behavioral manifestations of impulsivity, hyperactivity, and inattention[28]. However, as the planning of these individuals improves, the level of impulsivity and negative beliefs decreases because creating a plan and adhering to it can be a self-regulation challenge that improves time management strategies. Using time management strategies through various self-regulatory behaviors that support learning activities, including cognitive and metacognitive learning strategies and other related resource management strategies. Time management is considered a behavior that learners can actively control to regulate their learning activities. These skills include evaluative behaviors aimed at awareness of time use, behavior planning to set and adjust realistic goals, and monitoring behavior to observe time use during activities[29].

Other findings of the research also showed that the short-term planning component leads to an increase in negative

beliefs and reactive behaviors. Since this is the first time that this component is being examined about negative beliefs and reactive behaviors, no previous research background was found directly related to this variable and specific sample group. Therefore, we explain and justify the congruence of study findings with backgrounds that are related to this variable from one aspect. A study stated that planning and time management can impact stress levels and the relationship of behavior and attitude in time management positively correlates with adolescents' academic achievement[30]. Research results aimed at examining deficiencies in behavioral planning in hyperactive children also showed that inattention is mainly responsible for the lack of behavioral planning in children with hyperactivity[31]. In explaining this finding, it must be stated that time management is defined as behaviors aimed at achieving effective use of time during specific purposeful activities, and three levels of time management behaviors are short-term planning, long-term planning, and time attitude. The key to success in life is sufficient emphasis on planning and effective management of resources that everyone equally benefits from[30]. Time is a valuable resource that, once lost, can never be replaced. In other words, time is irreplaceable, fleeting, scarce, and priceless, requiring proper management to use it optimally. Limiting to short-term and daily planning can lead to long-term goals being forgotten. When teenagers only focus on daily planning, they practically do not consider future plans. If long-term planning is not done and teenagers experience disruptions in reaching their goals, their self-confidence decreases and negative beliefs and reactive behaviors increase in them[32].

Another finding of the research also showed that the variable of reactive behaviors does not have a significant influence on negative beliefs as a mediating variable, which is implicitly contradictory to previous studies[33-34]. Findings of a study that examined the importance of thought suppression and rumination as mediators between metacognition and behavioral addiction, showed that higher levels of metacognition are associated with higher levels of thought suppression and rumination[33]. In a study, it was also noted that resilience attention is a good predictor for factors such as negative beliefs, cognitive trust, and the need for thought control[۳۴]. The difference in the results of the present study from these studies may be due to differences in the study population, time and place of the study, or sample size.

It should be noted in explaining these findings that impulsivity is a very broad and common concept in everyday psychology and many scientific fields including clinical and personality psychology, psychiatry, animal research, and neuroscience. This concept generally refers to a wide range of actions or behaviors that are perceived weakly, expressed prematurely, are illogically risky or inappropriate to the situation, and often lead to undesirable consequences. Impulsivity is associated with many cognitive impairments and behavioral problems including attention deficit hyperactivity disorder, conduct disorder, substance use and abuse, behavioral addictions (such as gambling and gaming disorders), antisocial personality disorder, or bipolar disorder and impulsive behaviors are modified by a wide range of emotional, motivational, and cognitive processes[35]. The cognitive-behavioral system helps to adapt cognitive processes, so any deviation that may occur in this system is believed to be a significant factor in the development and perpetuation of many psychological disorders. Metacognitive beliefs, accompanied by avoiding thoughts or efforts to suppress thoughts to cope with a stressful situation, individuals with negative and repetitive beliefs about their cognitive processes may use more avoidance strategies when faced with negative internal and personal experiences, these individuals may avoid facing negative experiences, or they may engage in initiatives to delay the likelihood of facing them[36].

Each research design has its specific limitations and the accuracy of interpreting results should be considered in light of these limitations. One major limitation of this study is collecting information based on self-report scales, which are susceptible to unconscious defenses, bias in responses, personal presentation styles, and overall social desirability to distort. Response bias can be minimized by using a combination of self-report measures with observations, interviews, etc. Therefore, considering this limitation, it is suggested that in future research, in addition to questionnaires, other data collection methods such as interviews and observations should be used. Furthermore, since the results obtained from this study are limited to individuals with ADHD, caution must be taken when generalizing the results to other disorders. Also, the lack of related research backgrounds addressing components of planning, impulsive behaviors, and negative beliefs is another limitation of the study, which is recommended as a research proposal that researchers interested in this field should investigate in future studies. Additionally, considering that all participants in this study had ADHD, it is suggested that other studies be conducted on participants with different disorders to determine whether their results are consistent with the results of this study or not. It is also recommended that in future research, other researchers focus on different aspects of executive functions in individuals with ADHD.

The results of the present study indicate that while the long-term planning component reduces impulsive behaviors and negative beliefs, the short-term planning component increases negative beliefs and impulsive behaviors in novice psychopaths. The results also showed that impulsive behaviors as a mediating variable have no significant effect on negative beliefs. Based on the research findings, it is recommended that practicing psychologists in the field of ADHD use programs to improve time management and planning and control impulsive behaviors and negative beliefs in individuals with ADHD. Developing a precise plan to reduce the level of impulsive behaviors and negative beliefs in individuals with ADHD can help them achieve their desired behavior more effectively. Therefore, providing the necessary education, awareness, and skills for these individuals is vital and must be carefully planned.

Ethical Considerations

The ethical guidelines set by the institutional and/or national research committee, identified as IR.IAU.SHIRAZ.REC.1402.231, were adhered to during all research procedures involving human subjects.

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Conflict of Interest

The authors stated that they have no conflicts of interest.

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