

Original Article

Investigating the relationship between adolescents' tendency toward risky behaviors and mindfulness: The moderator role of future time perspective

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Abstract

Addressing the tendency toward high-risk behaviors in adolescents and investigating the related protecting factors is one of the crucial topics in adolescent health research. The present study investigated the moderating role of the future time perspective (TP) in the relationship between mindfulness and the tendency toward risky behaviors. For this purpose, 523 adolescent undergraduate students (aged 18 to 20 years) from Arak University, Iran, were selected through convenience sampling, and participated in this study and completed Short-Zimbardo Time Perspective Inventory-15, Addiction Potential Scale (APS), and Five-Facet Mindfulness Questionnaire. Results of a hierarchical multiple regression analysis by PROCESS macro (available for SPSS) showed that mindfulness and future TP accounted for significant variance in adolescents' tendency toward risky behaviors. Those with high mindfulness and future TP showed less tendency toward risky behaviors. However, those with high mindfulness scores, but low future TP, showed an increased tendency toward risky behaviors. In other words, the future TP can be a potential modifier of the relationship between mindfulness and adolescents' tendency toward risky behaviors. Therefore, in planning some of the programs and suitable interventions done to help adolescents, it is important to consider both of these factors at the same time.

Keywords

Adolescence
Future time
Perspective
Mindfulness
Risky behavior

Received: 2023/07/05

Accepted: 2023/11/21

Available Online: 2024/02/25

Introduction

Adolescence is characterized by rapid physical, cognitive, and social changes, which begin with puberty and lead to the attainment of adult roles and responsibilities. In recent years, ten years has been considered for the growth and development of adolescence, which indicates a more extended period for change in the four main areas of biological and sexual maturity, formation of personal identity, engagement in intimate sexual relations with appropriate peers, and creation of social independence and autonomy (Sawyer et al., 2012). Adolescents comprise 16% of the world's population – i.e., 1.3 billion today (UNICEF Data: 2022). With the emergence of this independence and new physical and cognitive abilities, the empiricism and risk-taking that characterize adolescence can sometimes lead to behaviors that endanger their health and well-being in the present and future. Adolescence is the peak of engagement with substance abuse, deviant behavior, unprotected sex, and reckless driving. Risk-taking is typically defined by, instead of choosing the safest option, choosing the option where the outcomes may most vary (Defoe et al., 2015),

that means a choice that may lead to the most benefits, but has also a lot of negative possibilities, where certainty is at a loss.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), high-risk behaviors are part of various mental disorders (American Psychological Association [APA], 2013), such as antisocial, and borderline personality disorders, substance abuse and addiction disorders which can start as early as childhood (Upton & Renshaw, 2019). In countries with aging populations, potential human resources are lost due to preventable health problems during adolescence, including smoking, alcohol and drug abuse, unprotected sex, poor diet, low levels of exercise, injury, violence, and mental disorders (Sanci et al., 2018; Porzoor et al., 2021). Many researchers have attracted the attention of protective factors as tools for healthy growth specifically in adolescence that can lead to resilience, skills, and communication. Therefore, it is very important to understand the protective factors to reduce the psychological problems of adolescents. One of the most important factors due to its relationship with mental health is mindfulness (Brown et al., 2007). The results of

some research show that mindfulness is also a positive personal resource during adolescence (Pepping et al., 2016). Mindfulness is very helpful for adolescents to cope with emotional change in this stage by providing a path to emotional well-being (Bluth & Blanton, 2014).

Broadly conceptualized, mindfulness has been described as a kind of awareness in which each thought, feeling, or sensation that arises in the attentional field is non-elaborative, non-judgmental, and present-centered (Bishop et al. 2004). The trait of mindfulness is associated with many well-being behaviors, including reducing the number and severity of high-risk behaviors (Brown & Ryan, 2003). A higher level of mindfulness is a protective factor in adolescents' decisions to smoke (Black et al., 2012) and consume alcohol (Reynolds et al., 2015). Beyond correlational research, mindfulness-based exercises have also reduced high-risk behaviors. Thus, dialectical behavior therapy has been developed specifically for treating disorders characterized by riskiness (Upton & Renshaw, 2019). Mindfulness also can be effective in controlling by increasing control over visual clues about alcohol and drug use. So, the mindfulness increases the ability of users to tolerate negative emotional states and enables them to effectively reduce risky behaviors (Hosseinian & Nooripour, 2019).

Mindfulness can also be considered a present-moment perspective (Seema & Sircova, 2013). From the point of view of mindfulness, presence in the present is considered necessary for the well-being and indicates a specific way of relating to time (Kabat-Zinn, 1990). As mentioned by Dreyfus (2011), mindful attention must not necessarily be directed toward an object in the present moment, and objects of mindful attention can also be in the past or the future. According to that, the conscious mind's attention does not necessarily have to be directed to the subject that is already happening either, and the subjects of the conscious mind can be the past or the future (Stolarski et al., 2016). The effectiveness of mindfulness on adolescents has been proven (Khalili, 2023).

Time perspective (TP) is one of the important factors in adolescence that has a critical role in risk-taking and engaging in risky behavior. Time perspective plays a role in encoding, storing, and recalling experienced events. It also helps in shaping expectations, goals, and probabilities, and has an effect on many important judgments and decisions, including numerous fields during adolescence, from choosing a school or job to engaging in risky behaviors (Germeijs & Verschuere, 2009).

Zimbardo and Boyd (1999) define the time perspective as an "often unconscious process" in which a continuous stream of personal and social experiences is assigned to time categories or time frames that are organized, coherent, and meaningful. This perceptual process is dynamic, but individuals usually have a relative emphasis or constant focus on a one-time frame, leading to a relatively stable bias. It can be said that TP, like mindfulness, is a psychological structure that expresses the individual's relationship with time (Sekścińska et al.,

2018). Zimbardo and Boyd (1999) define this concept as a fundamental dimension in the structure of psychological time, by which the cognitive processes classify one's experiences in the past, present, and future time frames. Since the beginning of research in this field, five dimensions have been identified for the concept of TP: 1) Past-negative indicates trauma, pain, and regret, 2) Past-positive shows a warm and emotional attitude toward the past, 3) Present-hedonistic indicates a desire to enjoy the present, take risks, and have little concern about its future consequences, 4) Present-fatalistic refers to a fatalistic, helpless, and hopeless attitude towards the future and life, 5) The future includes mental representations of future concerns and consequences, responsibilities, and striving for future goals and rewards.

It is assumed that individual differences in TP result from the habitual and early preferences of a particular framework or attitude over other time frames. When such a bias develops, this framework can be considered a stable condition that increases vulnerability to mental health and maladaptive behaviors (Rönnlund et al., 2019). Numerous studies have examined the relationship between TP and health-related behaviors. The future TP often showed a negative correlation with high-risk health behaviors (Zimbardo et al., 1997), substance use (Wills et al., 2001; Finan, 2022); and a positive correlation with health-protective behaviors (Zancu et al., 2022). It has also been shown that future TP was related to increased protective and decreased risky health behaviors and was associated with less drinking, drug use, and smoking. The relationship between TP and high-risk behaviors is generally well established, but its association with protective behavior factors has not been well studied. People with a more robust future perspective report less risky behaviors and more protective behaviors such as condom use, exercise, and healthy eating (Henson et al., 2006). The fact is that mindfulness can be educated, resulting in highly desirable changes in important life outcomes (Shapiro et al., 2008). Since both constructs of mindfulness and TP have a significant relationship with well-being and optimal functioning, it seems that individuals must consider the future at the same time to make consistent long-term decisions.

Given that mindfulness can develop, its promotion is expected to affect various aspects of life positively. Therefore, researchers have received more and more attention for identifying the potential mechanisms by which the positive effect of mindfulness is created. Schutte and Malouff (2011) have shown that emotional intelligence mediates the relationship between mindfulness and life satisfaction. Having considered mindfulness (present) and future TP while planning to help adolescents make healthy decisions, this research regards these two factors simultaneously and is thus of importance.

Accordingly, and considering the need to address the tendency toward high-risk behaviors in adolescents and to investigate the related protective factors, the present study was conducted to investigate the moderating role of future TP in the relationship between mindfulness and the

tendency toward risky behaviors in a group of adolescents.

Method

Participants

A total of 523 first-year university students (aged 18 and 20) from Arak University were selected through convenience sampling and participated in this study.

Instrument

Five-Facet Mindfulness Questionnaire:

The Five-Facet Mindfulness Questionnaire (FFMQ), was developed by combining items from the Freiburg Mindfulness Inventory, Mindful Attention Awareness Scale, Kentucky Inventory of Mindfulness Skills, Cognitive Affective Mindfulness Scale, and Mindfulness Questionnaire (Baer et al., 2006). It has been developed using the factor analysis approach. FFMQ is a self-report assessment that evaluates trait mindfulness overall. This questionnaire has 39 items (e.g. 'I pay attention to how my emotions affect my thoughts and behavior') rated on a 5-point scale ranging from 1 (never) to 5 (very often). It measures various aspects of mindfulness, including non-reactivity to inner experience (7 items), observing/ attending to sensations, acting with awareness, describing, and non-judging experience (each one 8 items). The internal consistency of the factors was acceptable, and the alpha coefficients were .75 to .91 for the five of them. Higher total scale scores indicate higher overall trait mindfulness. Several studies evaluated this instrument's psychometric properties (e.g., Baer et al., 2008; Veehof et al., 2011). Moreover, the test-retest Persian version's correlation coefficients were between .75 and .84. The alpha coefficients were also obtained at an acceptable level of .55 to .83 (Ahmadvand et al., 2013). In the present, study alpha coefficients were between .66 to .75.

Addiction Potential Scale (APS):

APS was developed by Weed et al. (1992), and Zargar designed the Iranian version in 2006. It has 41 items (e.g. 'I don't mind doing drugs once in a while') which include five lie detectors. The items are scored on a 4-point scale, ranging from 0 to 3, from completely disagree to agree. The highest score is assigned to antisocial behavior, desire to use drugs, positive attitude toward drugs, excitement, depression, and lack of self-expression. The criterion validity of the scale resulted in a recognizable difference in the addicted and non-addicted groups. The scale's reliability was assessed

using Cronbach's alpha, which was optimal at .94 (Zargar, 2006), and in the current study was equal to .96. A construct validity of the scale was obtained by correlating it with SCL-25 (25-item Scale of Clinical Symptom), and it was .45 ($P < .001$) (Zargar & Ghafari, 2009).

Short-Zimbardo Time Perspective Inventory-15 (SZTPI-15):

Zimbardo and Bond developed a self-report measure in 2011 called Zimbardo Time Perspective Inventory (ZTPI). Here, the score is measured by a 5-point scale, ranging from 1 (very true) to 5 (very untrue). It includes five subscales of negative and positive past, hedonistic and fatalistic present, and future. Zhang et al. (2013) offered a short version of this inventory. They obtained the brief measure of ZTPI with 15 items (SZTPI-15) (e.g. 'I believe that a person's day should be planned ahead each morning') and verified convergent and discriminant validity, external validity, test-retest reliability, and self-peer ratings. In the present study, Cronbach's alphas were between .60 to .72.

Procedure

Informed consent was obtained from all participants included in the study. The local Ethics Committee (Arak University, Iran) approved the protocol. After the study was explained to the participants, they answered the Zimbardo Time Perspective Inventory, the Addiction Potential Scale (to measure tendency toward risky behavior), and the Five-Facet Mindfulness Questionnaire.

SPSS software (version 21) was used for data analysis to provide inferential statistics, hierarchical multiple regression analysis was used. The PROCESS macro available for SPSS (Hayes, 2018), which has become widely used in testing hypotheses about moderation and mediation, was used.

Results

The participants in this research were 523 first-year undergraduate students (309 females and 214 males) from the faculties of humanities, sciences, engineering, and agriculture from Arak university.

The correlation, overall means, and standard deviation of the scores in the Addiction Potential Scale, Mindfulness, and Future TP outcomes are presented in Table 1. A preliminary data analysis was conducted to ensure compliance with the assumptions for the parametric statistics used in the study, and there was no violation.

Table 1. Correlation and Descriptive Statistics (N=523) of Tendency toward Risky Behaviors, Mindfulness, and Future Time Perspective

Variables	1	2	Total		female		male		Range
			M	SD	M	SD	M	SD	
1 Tendency toward Risky Behaviors			38.6	23	38	22.2	39.46	23.5	0-148
2 Mindfulness	-.14**		113	7.9	115	7.5	110	7.1	55-165
3 Future Time Perspective	-.25**	.15**	3.7	0.73	3.8	0.65	3.55	0.72	0-5

* $p < .05$. ** $p < .01$

A hierarchical multiple regression analysis was conducted to test the hypothesis that the tendency toward risky behaviors is a function of mindfulness and, more specifically, whether future TP moderates the relationship between these two variables (Figure 1). The PROCESS macro available for SPSS (Hayes, 2018), which has become widely used in testing hypotheses about moderation and mediation, was used. In the first

step, two variables were included: mindfulness and future TP. These variables accounted for a significant amount of variance in adolescents' tendency toward risky behaviors, $R^2 = .09$, $F(3, 519) = 16.17$, $p < .001$. The variables were centered on avoiding potentially problematic multicollinearity with the interaction term, and an interaction term between mindfulness level and future TP was created (Aiken & West, 1991).

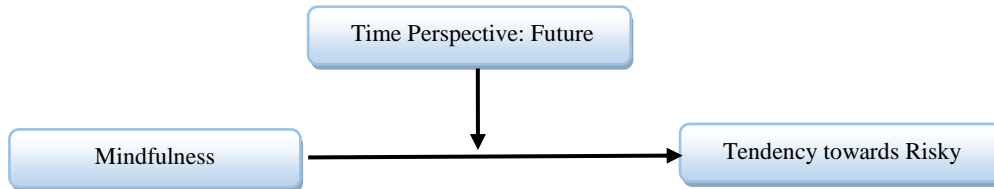


Figure 1. Hypothesized Path Model

As can be seen in Table 2, the interaction term was statistically significant in our model, and this result is consistent with the hypothesis that the future TP would moderate the effect of mindfulness on the tendency

toward risky behaviors, and mindfulness and future TP are significant predictors of the tendency toward risky behaviors.¹

Table 2. Linear Model of Predictions of Tendency toward Risky Behaviors

Predictors	b	t	p
Mindfulness (centered)	-0.25	2	$p < .05$
future time perspective (centered)	-7.25	5.44	$p < .001$
Mindfulness*future time perspective	-0.41	2.63	$p < .01$

The resulting graph is shown in Figure 2. The graph shows what we found from simple slope analysis: when future TP is low, the relationship between tendency toward risky behaviors and mindfulness is not significant ($b = 0.05$, $t(519) = .26$, $p > .05$); at the mean

value of future TP this relationship is negative and significant ($b = -0.25$, $t(519) = 2$, $p < .05$); and this relationship gets even stronger at high levels of future TP ($b = -0.55$, $t(519) = 3.6$, $p < .001$).

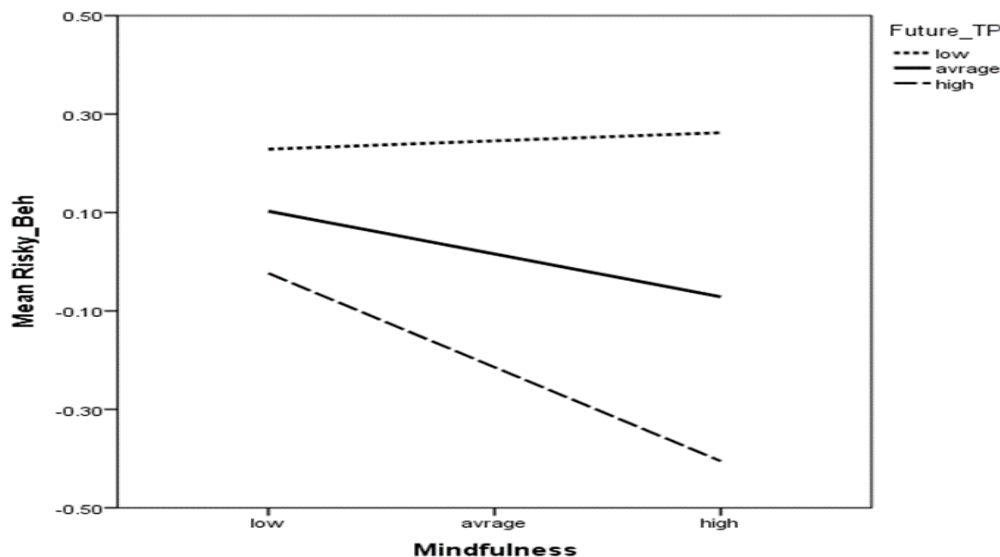


Figure 1. Line Graph of Interaction between Mindfulness and Future Time Perspective as Predictors of Tendency toward Risky Behaviors

Examination of the interaction plot showed an enhancing effect: as mindfulness and future TP increased, adolescents' tendency toward risky behaviors decreased. At low mindfulness, adolescents' tendency

toward risky behaviors was similar for adolescents with low, average, or high future TP. Adolescents with high mindfulness and high future TP tended to engage in risky behaviors less.

Discussion

This study aimed to investigate the moderating role of future TP in predicting the tendency toward risky behaviors based on mindfulness in adolescents. The findings showed that mindfulness has a significant negative relationship with the tendency toward risky behaviors. This result is consistent with previous research findings (Brown & Ryan, 2003; Black et al., 2012; Reynolds et al., 2015).

In explaining these findings, we should first point out the regulation of attention and decentralization as mechanisms of mindfulness that affect the processes that regulate adolescents' risky behaviors. Attentive processes facilitate the identification of risky behavior tempting symptoms, monitor behaviors, activate and maintain long-term goals, and improve executive attention and the ability to ignore impulses. Since directing and regulating attention in an engaging environment is vital to healthy behavior and avoiding risk-taking, the attention regulation component of mindfulness can increase a person's attention from the stimulus to the ability to accurately detect the internal and external signs of arousal. Regarding the other mechanism of mindfulness, namely decentralization, it is also important to note that applying a decentralized perspective to tempting stimuli can be vital to preventing risky behavior in adolescents by averting the growing tendency for some cues of possible benefits. This component can create the ability to think of reward-related thoughts as mere mental events, thoughts that typically lead to full-blown cravings. Understanding that the reward of consumption is a transient state of mind reduces the inherent attractiveness of the tempting stimulus and can curb motivations and desires. In addition, the continued use of decentralization can lead to sustained changes in the representation of engaging stimuli (Papies, 2017). This result indicates the remarkable impacts of these components of mindfulness on the underlying components of health behavior. In general, it can be said that mindfulness improves the representation of overcoming immediate pleasure in high-risk behaviors and the desire to receive rewards with delay in choosing healthy and low-risk behaviors.

Another study finding showed that the future TP mediates between mindfulness and adolescents' tendency toward risky behaviors. Future TP provides positive psychological resources for adolescents with high levels of mindfulness. This interaction-effect of future TP and mindfulness can influence decision-making related to taking risky behavior in adolescents, and increase their ability to cope with psychological problems. According to the assumption of general stress theory, when people feel stress and pressure, they experience negative emotions that will induce maladaptive behaviors. In this regard, low levels of mindfulness both weaken the ability to regulate emotions, control impulsive behaviors, and reduce awareness of the future TP (Zhang et al., 2020). Considering that one of the cognitive aspects of future

TP is the ability to establish a connection between current activities and future goals, this ability in adolescents with a higher level of future TP is the possibility of predicting the distant future through 1) eliminating long-term gap with motivational goals, plans, and projects; and 2) directing current actions toward more distant future goals. As a result, those actions become more desirable, and current activities are considered as a means to achieve future goals. Therefore, the future TP seems to increase the facilitating role of the conscious mind in ignoring the immediate pleasure of risky behavior and the desire to obtain delayed rewards.

Research shows that mindfulness significantly predicts progressive focus and individual prevention, and this association has been strongly confirmed with a preventive focus. According to Higgins (1997), progressive focus increases the pursuit of ideal goals, self-perception, and sensitivity to positive outcomes and facilitates using attentive attentional strategies to achieve goals. Under these circumstances, attention to the future decreases, and the likelihood of risky behavior increases. In contrast, prevention focuses on pursuing goals responsibly, increasing rational cognition and sensitivity to negative outcomes, and facilitating conscious avoidance strategies to achieve the goal, leading to inaction and maintaining the status quo. It naturally tends toward making safe and less dangerous choices. These conditions positively affect attention to the future and are negatively associated with the possibility of risk-taking in adolescents. In other words, while the promotional focus is positively related to risk, the preventive focus is negatively associated with it (Zhang et al., 2020).

Conclusion

Given what has been said, the future TP can be a potential moderator of the relationship between mindfulness and the tendency toward risky behaviors. Thus, conscious and insight-based action with a future TP can lead to a tendency toward more positive and less negative behaviors by improving prevention focus. In general, the TP of the future, through momentum regulation and momentary awareness, increases alertness and reduces risky behaviors. Science, mindfulness is considered a protective factor in adolescents' tendency to risky behaviors, and FTP helps them consider the consequence of their decisions and actions. Research shows that some interventions reduce risky behaviors in adolescents (Shamsnajafi et al., 2023). Therefore, in planning some of the programs, and suitable interventions done to help adolescents, it is important to consider both these factors at the same time.

One limitation of the present study was the measures of the tendency toward risky behaviors, which only include a small range of high-risk behaviors (antisocial behavior, desire to use drugs, positive attitude to drugs, and excitement). Future studies are needed to investigate the relationship between levels of

mindfulness, time perception, and risk-taking behavior using alternative methods and measures. Additional research is also required to understand how and whether mindfulness-based practices along with future-oriented behaviors can help to reduce adolescents' tendency toward risky behaviors. More research is needed to be done regarding the tendency to risky behaviors in adolescents and to consider factors such as family and socioeconomic class and personality traits.

The authors confirm the absence of any conflict related to financial interests, relation with organizations or person in any way involved in the research, and interrelations of the co-authors.

Author contribution

Soghra Akbari Chermahini: Idea & Conceptualization, Project Administration, Supervision, Original Draft Preparation, Writing, Revise & Editing, Data Curation, Analysis

Mahdiyeh Shafieetabar: Idea & Conceptualization, Design, Writing, Revise & Editing.

Acknowledgments

The authors are thankful to Arak University for financial support, and also our profound gratitude to all of the adolescents who participated in this study at Arak University.

Informed Consent

Written informed consent was obtained from all individual participants included in the study. The protocol was approved by the local Ethical Committee in Arak University (Arak University, Arak, Iran).

Conflict of Interest

The authors confirm the absence of any conflict related to financial interests, relation with organizations or person in any way involved in the research, and interrelations of the co-authors.

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