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Investigating the Relationship between Psychological Stress Response and Non-Suicidal Self-Injurious Behaviors in Senior High School Students: The Mediating Role of Sleep Disorders

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Abstract

Background: *One of the high-risk behaviors throughout adolescence is intentional self-injury without suicidal intent, which can be considered one of the destructive behaviors in adolescence. This study aimed to investigate the mediating role of sleep disorders in the relationship between psychological stress response and non-suicidal self-injurious behaviors in senior high school students.*

Methods: *The research study followed a descriptive-correlational design and was conducted in a cross-sectional approach. As for the analytical method, the study adopted Structural Equation Modeling (SEM). The statistical population comprises all male and female senior high school students studying in Tehran from September to October 2023. Two hundred sixty-eight individuals were selected through the purposive sampling method. In the present study, the Self-Harm Inventory (SHI), Coping Inventory for Stressful Situations (CISS), and Pittsburgh Sleep Quality Index (PSQI) questionnaires were used. Descriptive statistics were calculated using SPSS-27, and data trends and standard coefficients were analyzed using SmartPLS 4 software. Likewise, the Sobel test was utilized to assess the significance of the mediating variable. The significant level was set at 0.05.*

Results: *According to the standard path coefficients, task-oriented coping demonstrated a significant negative impact on self-injurious behaviors (β=-0.446, P-value<0.001), and sleep disorders (β=-0.567, P-value<0.001). Likewise, emotion-oriented coping significantly impacted self-injurious behaviors (β=0.262, P-value=0.015); however, it had no significant impact on sleep disorders (β=-0.05, P-value=0.153). Also, as evidenced by the obtained results, the avoidance-oriented coping variable significantly affected the self-injurious behaviors variable (β=-0.567, P-value<0.001) as well as the sleep disorders variable (β=-0.438, P-value<0.001). Sleep disorder variables also demonstrated a significant positive impact on the self-injurious behaviors variable as a mediating variable of the research model (β=0.358, P-value<0.001).*

Conclusions: *According to the results, task-focused treatment had a significant negative effect on suicidal behavior and sleep disturbances. Similarly, emotion-focused coping contributed significantly to self-injury. However, it had no significant effect on sleep disorders. The sleep disorder variables also showed a significant positive effect on the suicidal behavior variable as a mediator in the research model.*

Keywords: Sleep Disorders, Psychological Stress, Non-Suicidal Self-Injury, Adolescents.

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Introduction

Adolescence is a sensitive period of life marked by various biological, environmental, and social changes. When encountering conflicts, some adolescents choose non-suicidal self-injurious behaviors as a way to cope with the pressures they experience[1]. The prevalence of diverse forms of self-injurious behavior throughout adolescence is higher compared to other life stages, with the highest rate of self-injury reported among girls aged from 16 to 24[2]. Approximately one out of six adolescents is involved in self-injury, and half of them report repeated self-injurious incidents. This behavior is often referred to as non-suicidal self-injury, involving intentional injury to one's own body without the intent of suicide but for socially unacceptable purposes[3]. Non-suicidal self-injurious behavior might include cutting, scratching, abrading, biting, punching oneself, acid splashing, hitting, breaking, and burning oneself, resulting in the destruction or deformation of a part of the body[4]. Stressful experiences during adolescence might cause non-suicidal self-injury as a form of emotion[5].

In the same way, the immaturity of the prefrontal cortex in adolescence might contribute to irrational decision-making and weak impulse control, especially during stressful situations. This can lead to the execution of more high-risk behaviors, such as non-suicidal self-injury, not only among typical adolescents but also among those with pre-existing mental health issues[6]. Research findings in this scope indicate that stress-inducing factors play a significant role in predicting non-suicidal self-injury[7]. Furthermore, Boyne et al. (2022) maintained that non-suicidal self-injury predicts an increase in perceived stress over time[8]. As suggested by another study, an increase in stressful experiences predicts an increased risk of non-suicidal self-injury through emotion dysregulation[9]. Likewise, the existing body of research indicates a consistent association between high levels of perceived stress and poor sleep[10].

Adolescence is a period associated with increasing health-related challenges, such as perceived stress and sleep

disorders[10]. Stress and sleep disorders exhibit a bidirectional relationship that affects the central nervous system and metabolism. Generally, each of the sleep disorders is a source of stress and develops a cyclical effect that constantly harms physical and mental health[11]. These disorders have a significantly negative impact on the quality of life. Sleep disorders, such as periodic limb movement disorder (PLMD), rapid eye movement sleep behavior disorder (REM), bruxism, obstructive sleep apnea (OSA), and insomnia, affect a wide range of individuals daily[12]. In this regard, the findings of the study conducted by Khazaie et al. (2021) demonstrated that sleep problems, including short sleep duration, sleep disorders, and poor sleep quality, are associated with non-suicidal self-injury[13]. Additionally, as indicated by another study, poor sleep is associated with a higher risk of non-suicidal self-injury, which represents emotion dysregulation[4]. Similarly, Bandel et al. (2020) concluded that insomnia symptoms are associated with engagement in non-suicidal self-injury, and adolescents reporting insomnia symptoms should also be evaluated for self-injurious behavior[14].

Due to the widespread occurrence of non-suicidal self-injurious behaviors among both clinical and non-clinical groups of adolescents, it is crucial to examine the influence of sleep disorders and psychological stress on these behaviors. This investigation should specifically focus on senior high school students. Although the issue is widely recognized, there is a lack of research specifically investigating the function of sleep disorders in moderating the association between psychological stress response and non-suicidal self-injurious behaviors in senior high school adolescents. Thus, there appears to be a lack of research in this domain, and the current study is among the earliest investigations to explore the mediating role of sleep disorders in the relationship between psychological stress response and non-suicidal self-injurious behaviors in senior high school students. Figure 1 displays the conceptual model of the research.

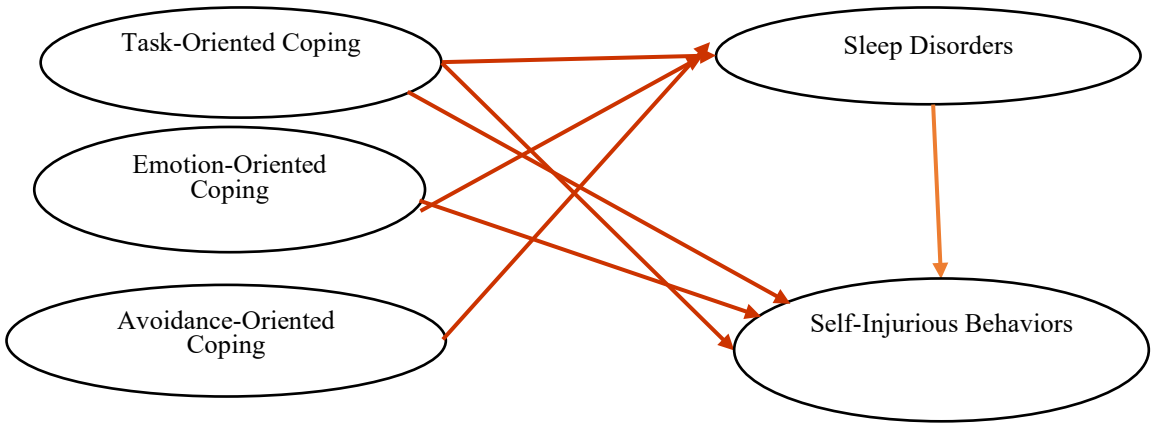

Figure 1. Conceptual framework of the research

Materials and Methods

The present study followed a descriptive-correlational design, conducted in a cross-sectional approach. As for the analytical method, the study adopted Structural Equation Modeling (SEM). The statistical population comprised all male and female senior high school students studying in Tehran from September to October 2023. The sample size was determined based on the number of research variables and the statistical model. According to Loehlin and Beaujean's assumption[15], along with the number of paths and variables in the study, a sufficient number of participants for testing the proposed model and research hypotheses ranges from 250 to 350. Therefore, the researcher selected a sample size of 300 participants. The inclusion criteria to enter the study included informed consent, responding to all questions, and sufficient literacy to understand the content. Those not qualified by the mentioned criteria were excluded from the study. However, the exit criteria included incomplete responses to all questionnaires and the reluctance to continue participating in the research.

Participants were selected through a multi-stage cluster sampling method. Initially, 22 urban districts were spotted in Tehran, among which six were randomly selected. The authors did the randomization for selecting urban districts using the method of random numbers table. In the next step, the purposive sampling method was employed to select participants, and the questionnaires were administered. In total, 32 participants were excluded from the study for various reasons, such as withdrawing from the research or not responding to more than ten questions in the questionnaires, resulting in 268 participants who fully attended the questionnaires being included in the study. As for the research stages, six urban districts were initially randomly selected, and then one school was chosen from each district. The schools remained anonymous to protect their information. To conduct the sampling, in the first step, the researcher obtained the

necessary permissions and recommendation letters from the university; following that, coordination was made with the selected schools. Variables of sleep disorders, psychological stress response, and non-suicidal self-injurious behaviors were assessed in each participant. The administration of questionnaires for each participant took 30 minutes, and the research was conducted over three months. Participants were asked to sign a cooperation consensus form before administering the questionnaires to adhere to the ethical principles of the research, and there was no obligation for the participants to take part in or continue the research. All the individuals were informed that participation in the research was entirely voluntary and that they could withdraw from the study at any time. They were also assured that the tests contained no personal information. In the next step, the researcher investigated the underlying assumptions of the test: the normality of the research variables distribution was assessed using the Kolmogorov-Smirnov test. Consequently, the research variables were not reported to have a normal distribution due to the observed significance in research variables, so it is better to use SmartPLS software to run the Structural Equation Modeling (SEM). The researcher adopted the random sampling method to meet this assumption of the random sample.

The sample size (or the size of the data set) was sufficient to implement the Structural Equation Modeling so that the assumption of enough data was met using the partial least squares method; the reported value was equal to 268 participants. Descriptive statistics were calculated using SPSS-27. Data trends and standard coefficients were analyzed using SmartPLS 4 software. Likewise, the Sobel test was utilized to assess the significance of the mediating variable.

The Self-Harm Inventory (SHI): The Self-Harm Inventory (SHI) was developed by Sansone et al. to assess the precedent of self-injury in respondents[16]. The questionnaire consists of 22 questions that assess self-injury on a Likert scale, with questions such as (Have you punished yourself with negative thoughts and self-blame?). The Self-Harm Inventory is scored based on a binary system of "yes" or "no." So, only respond "yes" to instances where you have intentionally engaged in self-injury. The "no" option receives a score of 0, while the "yes" option receives a score of 1. In contrast to a clinical interview, which takes approximately one hour or possibly longer to administer, the diagnostic accuracy of the self-harm inventory is reported to be 85.5%. In other words, individuals scoring five or higher on the questionnaire are likely to exhibit symptoms of borderline personality disorder (BPD) with an 85% probability. Only the confirmed answers (i.e., the number of "yes" responses) are summed up to calculate the total score of this questionnaire. "No" responses do not contribute to the scoring. The maximum score on the questionnaire is 22. In Iran, the content, face, and criterion validity of this questionnaire were reported to be appropriate [17]. In this study, Cronbach's alpha coefficient for this questionnaire was calculated to be above 0.70.

Coping Inventory for Stressful Situations (CISS): This questionnaire was developed by Endler and Parker (1990)[18]. The questionnaire consists of 48 items and is rated on a Likert scale ranging from “Never” (1) to “Always” (5). The CISS questionnaire encompasses three main domains of coping behaviors:

1. Task-oriented coping or active coping with the problem to manage and resolve it.

2. Emotion-oriented coping or focusing on emotional responses to the problem.

3. Avoidance-oriented coping or escaping from the problem.

As the Likert scale comprises five levels, the maximum score for each item is 5, while the minimum is 1. The participant must answer all the questions. If the participant left five questions or fewer unanswered, the researcher can assign option 3 for these questions during scoring. However, the questionnaire will not be scored if more than five questions remain unanswered. The range of variations in the three types of coping behaviors is such that the score for each of the coping behaviors, namely task-oriented, emotion-oriented, and avoidance, ranges from 16 to 80. In other words, the dominant coping style of the individual is determined according to the total score obtained in the test. Whichever behavior earns a higher score is considered the individual's coping style[18]. Also, the validity of the mentioned questionnaire has been confirmed through research studies conducted in Iran[19]. In this study, by using Cronbach's alpha, the reliability coefficient of CISS was obtained at a high level (0.81).

The Pittsburgh Sleep Quality Index (PSQI): The Pittsburgh Sleep Quality Index (PSQI) was developed by Buysse et al. to evaluate sleep quality and identify individuals with either excellent or poor sleep[20]. The questionnaire investigates the attitudes patients hold towards sleep quality over four weeks. It comprises 18 questions and seven subscales, including mental sleep quality, sleep onset latency, sleep duration, habitual sleep efficiency (based on the ratio of actual sleep time to time spent in bed), sleep disturbances, use of sleep medications, and disturbance in daily activities. Questions 1 and 3 are not scored independently but contribute to the calculation of other scales. For question 2, the scoring is as follows: less than 15 minutes (score 0), 16 to 30 minutes (score 1), 31 to 60 minutes (score 2), and more than 60 minutes (score 3). For question 4, the scoring is more than 7 hours (score 0), 6 to 7 hours (score 1), 5 to 6 hours (score 2), and less than 5 hours (score 3). For the remaining questions, assign a score of 0 to 3 for each option: none (score 0), once a week (score 1), twice a week (score 2), three or more times a week (score 3). The total scores on this scale range from 0 to 54, with higher scores indicating lower sleep quality. The validity and reliability of this questionnaire has also been confirmed in Iran, with a Cronbach's alpha coefficient between 78.0 and 82.0[21]. The reliability of this scale is calculated at 0.80, and its validity, reassessed through a subsequent test, is reported to be between 93.0 and 68.0.

Results

In the first stage, the researcher investigated the descriptive statistics of the research variables. The students were divided

into two groups concerning their gender: boy (56.3%) and girl (43.7%). Likewise, the students were divided into three groups in terms of academic fields, including mathematics (32.8%), empirical (49.3%), and humanities (17.9%). Students from six schools were surveyed (Table1).

As demonstrated in Table 2, the mean scores of task-oriented coping, emotion-oriented coping, avoidance-oriented coping, sleep disorders, and self-injurious behaviors are 51.28±14.6, 40.99±17.3, 43.95± 18.2, 24.41±10.9, and 12.34±3.8, respectively.

As evident in Table 3, research variables demonstrated a significant relationship with each other (P-value<0.001). According to the Pearson correlation coefficient, there was a negative and significant relationship between the task-oriented coping variable and the sleep disorders and self-injurious behaviors variables (P-value<0.001). Likewise, there was a significant positive relationship between the variables of emotion-oriented coping and avoidance-oriented coping with the variables of sleep disorders and self-injurious behaviors (P-value<0.001). Likewise, a significant positive relationship was observed between the sleep disorders and self-injurious behaviors variables (P-value<0.001).

As demonstrated by the results in Table 4, Figures 2 and 3, the path coefficients related to the final model are significant (P-value<0.001). According to the standard path coefficients in Table 4, task-oriented coping indicated a significant negative impact on self-injurious behaviors (β=-0.446, P-value<0.001), and sleep disorders (β=-0.567, P-value<0.001). Likewise, emotion-oriented coping exhibited a significant impact on self-injurious behaviors (β=0.262, P-value=0.015) but had no significant impact on sleep disorders (β=-0.05, P-value=0.153). Also, based on the obtained results, the avoidance-oriented coping variable significantly affected the self-injurious behaviors variable (β=-0.567, P-value<0.001), and the sleep disorders variable (β=-0.438, P-value<0.001). Meanwhile, the sleep disorders variable indicated a significant positive impact on the self-injurious behaviors variable (β=0.358, P-value<0.001) as the mediating variable of the research model. As a result of this finding, the structural model of the research was confirmed. Furthermore, the Sobel test was utilized to check the significance of the mediating variable of the research. This test was calculated using the following formula: In the Sobel test, if the Z value exceeds 1.96, it can be confirmed that the mediating effect of a variable is significant at the 95% confidence level.

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

The obtained Z-value concerning the path of the variable task-oriented coping on the variable self-injurious behaviors with the mediation of the variable sleep disorders was equal to -3.357. According to the resulting values in the Sobel test, the mediating variable of the research is significant. At the same time, the Z-value for the path of the emotion-oriented coping variable on the self-injurious behaviors variable with the mediation of the sleep disorders variable was equal to 2.171. Based on the values obtained in the Sobel test, it could be concluded that the mediating variable of the research is significant. Also, the resulting Z-value for the path of the avoidance-oriented coping variable on the self-injurious behaviors variable with the mediation of the sleep disorders variable was equal to -2.306. Considering the reported values in the Sobel test, it could be concluded that the mediating variable of the research is significant.

As is evident in Table 5, Cronbach's alpha and composite reliability of the variables were higher than 0.7. On the other hand, since the AVE index exceeded 0.5, the convergent validity of the model was confirmed. As a result, the reliability and validity of the model have been confirmed. The square root of the obtained values of AVE was placed in the diameter of the correlation matrix between the factors. Since the correlation values between the factors did not exceed the matrix diameter values, it could be concluded that the model's divergent validity was also confirmed. Additionally, based on the SRMR index, a value of 0.044 was obtained, which is less than 0.8, indicating a good fit for the model. Likewise, the researcher used blindfolding to check the model's predictability power for the research variable. Values of Q2 or goodness of Fit above zero indicate a good fit with the model. The Q2 value for the self-injurious behaviors variable was 0.459 and 0.771 for the sleep disorders variable. As a result, the model fitting was confirmed.

Table 1. Descriptive statistics of the variables

Variables	Groups	Frequency	Percent	Total	Median
Field	Mathematics field	88	32.8	268	2
	Empirical field	132	49.3		
	Humanities field	48	17.9		
Gender	Boy	151	56.3	268	1
	Girl	117	43.7		
School	School 1	43	16.0	268	3
	School 2	56	20.9		
	School 3	47	17.5		
	School 4	46	17.2		
	School 5	44	16.4		
	School 6	32	11.9		

Table 2. Descriptive statistics of the variables

Variables	Mean±SD	Min	Max

Task-oriented coping	51.28±14.6	2	**79**
Emotion-oriented coping	40.99±17.3	2	**79**
Avoidance-oriented coping	43.95±18.2	2	**79**
Sleep disorders	24.41±10.9	11	**51**
Self-injurious behaviors	12.34±3.8	6	**21**

Table 3. Correlation matrix between research variables

Row	Variables	1	2	3	4	5	P-value
1	Task-oriented coping	-					<0.001
2	Emotion-oriented coping	-0.444	-				<0.001
3	Avoidance-oriented coping	-0.647	0.770	-			<0.001
4	Sleep disorders	-0.827	0.538	0.765	-		<0.001
5	Self-injurious behaviors	-0.650	0.405	0.442	0.622	-	<0.001

Table 4. Research coefficients and significance of the model

Relationship of variables	Path coefficient	P-value	T-value	Results
Task-oriented coping -> Self-injurious behaviors	-0.446	< 0.001	6.18	**confirmation**
Emotion-oriented coping -> Self-injurious behaviors	0.262	0.015	2.44	**confirmation**
Avoidance-oriented coping -> Self-injurious behaviors	-0.322	0.01	2.60	**confirmation**
Task-oriented coping -> Sleep disorders	-0.567	< 0.001	19.33	**confirmation**
Emotional -oriented coping -> Sleep disorders	-0.05	0.153	1.433	**rejection**
Avoidant -oriented coping -> Sleep disorders	0.438	< 0.001	10.34	**confirmation**
Sleep disorders -> Self-injurious behaviors	0.358	< 0.001	3.98	**confirmation**

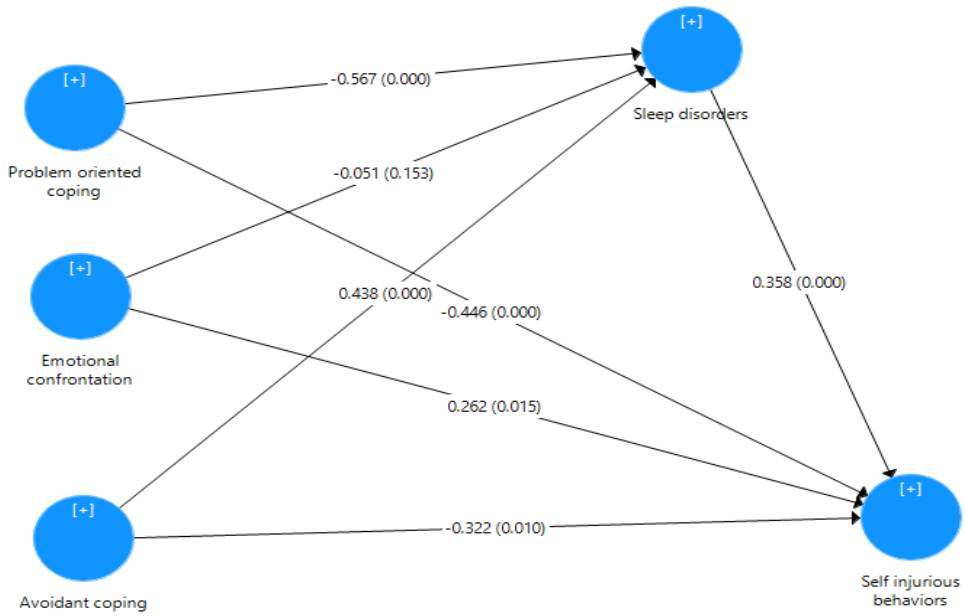

Figure 2. Path coefficients between variables and significance level

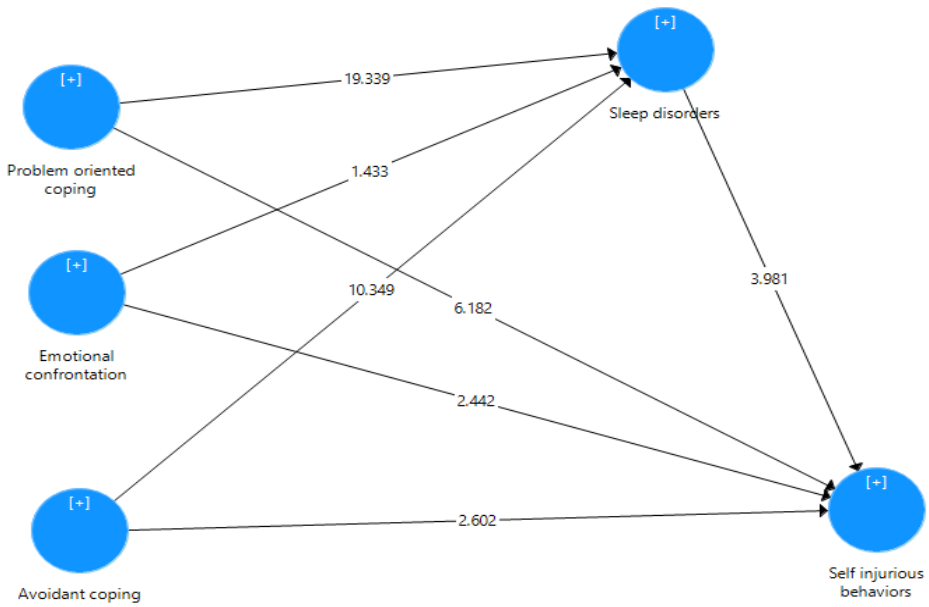

Figure 3. T-value between variables and significance level

Table 5. Reliability and validity of the model

Variable	Cronbach's Alpha	Composite Reliability	AVE
Task-oriented coping	0.812	0.838	0.58
Emotion-oriented coping	0.781	0.811	0.67
Avoidance -oriented coping	0.783	0.832	0.66
Sleep disorders	0.769	0.788	0.74
Self-injurious behaviors	0.751	0.767	0.71

Discussion

The present study aimed to investigate the mediating role of sleep disorders in the relationship between psychological stress response and non-suicidal self-injurious behaviors among senior high school students. In correspondence to the results obtained, confidence intervals for indirect paths indicated that the zero value was not included in these intervals. Therefore, it became clear that sleep disorders play a mediating role in the relationship between avoidance-oriented coping style, task-oriented coping, emotion-oriented coping, and non-suicidal self-injurious behaviors. These results are consistent with the findings of McClelland et al.[22], Silva Filho et al.[23], Kozusznik et al.[24], and Xiao et al.[25].

Kozusznik et al. showed that low emotion-focused coping and high problem-focused coping are associated with lower depressive symptoms, which, in turn, are associated with better objective and subjective sleep quality. Moreover, greater use of emotion-focused coping is related to more perceived sleep time[24]. Moreover, results showed that younger age, diagnosis of borderline personality disorder, and higher emotion-oriented coping were associated with self-harm. After controlling for age and borderline personality disorder, higher levels of emotion-oriented coping were found to be a significant predictor of self-harm. Emotion-oriented but not avoidance-oriented coping significantly predicted self-harm[26]. To account for the mentioned findings, it is essential to note that psychological changes, including increased irritability and anger, can make it more challenging to cope with the slight pressures of daily life. Sleep deprivation can also hinder coping with minor stresses and pressures, while the daily increase in pressures due to insomnia itself becomes a source of stress[5]. Like many other psychological factors, stress can relate to sleep in a way that makes individuals experiencing stress more prone to sleep problems. Furthermore, sleep deprivation itself can develop stress. This became evident in a study that identified sleep-related issues as one of the factors contributing to the onset of stress disorders in children and adolescents. Therefore, individuals struggling with sleep problems for an extended period are more subject to stress and mental pressure[7]. Consequently, individuals who effectively employ coping styles probably have better quality of sleep, and exhibit more appropriate behavior while encountering psychological stress. On the other hand, individuals using ineffective coping styles

resulting from sleep problems in adolescence are more likely to exhibit frequent inappropriate and high-risk behaviors, such as self-injury, when exposed to adolescent stress[10]. In explaining this result, the authors argued that task-oriented coping styles act as a buffer against psychological pressure[27]. Research has demonstrated that adolescents who utilize coping styles, whether emotion-oriented or task-oriented, in pressure situations exhibit fewer negative emotions than those who resort to avoidance-oriented coping styles[28].

The findings of the present research correspond with the results of Ewing et al.[9], Frick et al.[10], Merrill et al.[11], Khazaie et al.[13], and Bandel et al.[14]. In explaining this issue, it is necessary to note that the primary goal of emotion-oriented coping is for individuals to calm themselves. Individuals, especially girls, attempt to gain control over the situation by expressing emotions such as crying, agitation, confabulating with others, distracting emotions, praying, and supplicating. It is essential to note that it is conceivable to employ emotion-oriented coping in conjunction with task-oriented coping, dependent on regulatory effects[9-13]. In this case, the individual first calms themselves using emotion-oriented coping and then attempts to overcome psychological pressure using task-oriented coping. The context of the sample under investigation in the research might account for the inconsistency of the findings relevant to this part of the research with many other studies in this field[11]. Several studies with conflicting results have been conducted in very different contexts compared to the present research[12-14].

This research has been conducted in a traditional society where individuals, especially girls, inform others about their problems and make them aware by seeking their support using strategies such as seeking spiritual support, seeking social support, and taking social action. In non-traditional societies, seeking help from others is still perceived as a norm and an effective strategy. So, as a result, issues such as non-suicidal self-injurious behaviors are reduced. In explaining this result, it should be mentioned that, as previously stated, the avoidance coping style includes strategies such as worry, efforts for fixation, wishful thinking, incompatibility, ignoring the problem, stress reduction, self-restraint, and self-blame.

Considering these strategies, it can be assumed that in this coping style, the individual is essentially in denial of psychological pressure[28]. Regarding this point, it can be concluded that the use of this coping style leads to an increase in psychological problems, including self-injurious behaviors[26]. In further explaining the issue, it should be noted that sleep disorders decrease overall well-being (e.g., tantrums, reluctance, decreased attention, energy, and concentration, and increased fatigue) throughout the day[11]. Furthermore, it causes mental complaints of daily fatigue. Additionally, insomnia leads to the development or coexistence of other disorders, such as depression and anxiety, which in turn lead to interpersonal, social, and occupational problems; also, irritability increases poor concentration during the day[13]. Also, insomnia leads to an increase in the emergence of physiological and psychological problems related to stress (e.g., headaches, increased muscle tension, gastralgia). Similar to insomnia, which can cause problems for individuals, hypersomnia might lead to significant functional disorders in work, social, and occupational relationships. Irregular daily sleep schedules can be worrisome and even dangerous during activities such as driving or operating machinery. The low level of consciousness occurring when an individual struggles with sleepiness might lead to poor effectiveness, poor concentration, and poor memory during daily activities[14]. Sleep is, in fact, an indicator of individuals' health; nighttime sleep directly affects how individuals feel the next morning. Insufficient sleep makes individuals unable to regulate their mood, which, in turn, lowers the threshold for self-injurious behaviors[9].

The present research has limitations, among which the following can be mentioned: the nature of the correlational study makes it challenging to draw causal conclusions about its findings. Additionally, like other similar studies, there is a possibility of participants' socially desirable responses or self-serving bias in responding to the questionnaires. Finally, this research was conducted in the year 2022 among senior high school students in the city of Tehran. Caution should be exercised in generalizing its results to other times and settings.

According to the results, task-focused treatment had a significant negative effect on suicidal behavior and sleep disturbances. Similarly, emotion-focused coping contributed significantly to self-injury. However, it had no significant effect on sleep disorders. In addition, as shown by the obtained results, the avoidance-oriented coping variable had a significant effect on the self-injurious behavior variables and the sleeping disorder variables. The sleep disorder variables also showed a significant positive effect on the suicidal behavior variable as a mediator in the research model.

Given that adolescents are the founders of the country’s future and considering that they account for a significant percentage of society, society must attempt to improve their mental. In this regard, and in association with the present research, a variety of suggestions are proposed, some of which are highlighted below by conducting workshops on psychological stress management and respective coping skills for adolescents. Comprehensively studying non-suicidal self-injurious behaviors and formally presenting solutions for reducing and preventing such behaviors in schools all over the country, elaborating on the role of coping styles and their relationship with reducing non-suicidal self-injurious behaviors in educational and extracurricular programs, introducing effective and ineffective coping styles for adolescents so that they can select more effective styles and make informed choices in coping with the wide range of mental health issues during adolescence, thereby preserving their mental well-being, collaborating with the National Broadcasting Center along with other public social media to raise awareness among adolescents about desirable approaches to coping with issues and problems, aiming to reduce mental health disorders.

In the research domain, it seems beneficial to conduct further investigations to complement the findings of this research. Proposed research endeavors include conducting similar studies in populations with different age groups and cultural backgrounds, conducting research using other age-appropriate questionnaires for adolescents to enhance the credibility of the findings, doing similar research on clinical

populations, employing possible intervention methods to examine the impact of coping styles on non-suicidal self-injurious behaviors, and eventually, exploring other factors influencing non-suicidal self-injurious behaviors in adolescents.

Ethical Considerations

The Ethics Committee of the Payame Noor university approved the study (IR.PNU.REC.1402.112).

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Conflict of Interest

There are no conflicts of interest, according to the authors' statement.

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