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# Understanding Adolescent Cyber Victimization: The Predictive Influence of Mindfulness and Alexithymia Analyzed through Stepwise Regression

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## Abstract

**Introduction:** The influence of the cyber world on adolescents is widely acknowledged, with any harm incurred in this domain potentially having lasting impacts on their lives. Cyber victimization emerges as a significant concern in this context. This study aimed to investigate the predictive role of mindfulness and alexithymia in predicting cyber victimization among adolescents aged 14 to 18 in Zanjan during the 2022-2023 academic year.

**Method:** This research utilized a correlational design to examine the relationships between mindfulness, alexithymia, and cyber victimization. Using convenience sampling, a sample of 380 adolescents (195 boys and 185 girls) was selected. The sample size was determined based on Tabachnick and Fidell's formula. Data were collected through self-report questionnaires, Toronto Alexithymia (TAS-20), Cyberbullying-Victim Experience Questionnaire, Antiado et al., and Brown and Ryan's Mindfulness Scale (MASS) were performed. For data analysis, stepwise regression was employed using SPSS 27.

**Results**: In Step 1, alexithymia significantly predicted 8.2% of the variance in cyber victimization ($\beta = 0.286$, $p = 0.000$). In Step 2, with the inclusion of mindfulness, the total explained variance increased by 2.1% ($\beta = -0.161$, $p = 0.003$). The findings indicated that alexithymia had a positive relationship with cyber victimization, while mindfulness showed a significant negative relationship with cyber victimization. Thus, alexithymia and mindfulness were identified as important predictors of adolescents' vulnerability to cyber victimization.

**Conclusion**: These results suggest potential psychological interventions aimed at reducing the risk of cyber victimization by enhancing mindfulness and reducing alexithymia traits.

**Keywords:** Adolescent, Cyber Victimization, Alexithymia, Mindfulness, Cyber World

## Introduction

Throughout adolescence, significant transformations transpire within the social and cognitive domains, closely intertwined with the maturation of the nervous and hormonal systems [1]. This developmental phase encapsulates pivotal decision-making processes for adolescents as they endeavor to improve social connections while striving for increased autonomy [2]. Adolescence stands as a crucial juncture with profound implications for an individual's life trajectory. Mental health challenges during this stage can significantly impact academic advancement, social functioning, and prospects [3].

As per the 2017 World Health Organization (WHO) report, an estimated 10 to 20% of children and adolescents globally grapple with mental health issues [4]. Consequently, adolescence emerges as a period marked by heightened vulnerability to mental health

disorders [5]. In the contemporary landscape, adolescents significantly engage with and are influenced by the realms of cyberspace, utilizing these spaces for interpersonal communication. The pervasive use of cell phones has reached unprecedented levels, sparking concerns among parents and stakeholders regarding its potential impact on the mental well-being of adolescents [6].

Cyber victimization significantly impairs the mental well-being of adolescents immersed in cyberspace. This form of victimization, often stemming from cyberbullying, has been extensively studied and found to exert detrimental effects on the mental health of both children and teenagers [7]. Cyber victimization manifests when an individual is persistently and deliberately subjected to aggression, utilizing electronic or internet tools as a mediums. Unlike traditional victimization, cyber victimization occurs within cyberspace and internet-related arenas, inflicting potential physical and psychological harm. Within this dynamic, an inherent imbalance of power and equity exists between the perpetrator and the victim [7].

Cyberbullying has emerged as a prevalent issue in contemporary society, constituting a substantial global public health concern. Typically commencing in adolescence, its impact can persist into early adulthood. This psychological and social challenge has garnered attention due to recent studies elucidating its significant adverse effects [8]. The research underscores the heightened susceptibility to anxiety, depression, substance abuse, interpersonal conflicts, behavioral issues, diminished self-esteem, and academic underachievement among those affected [9].

During adolescence, a pivotal variable to consider is alexithymia, denoting the inability to recognize and regulate emotions [10]. Individuals grappling with this condition encounter difficulties in externalizing thoughts and articulating and identifying emotions [11]. Alexithymia appears on three levels: Difficulty Identifying Feelings, Difficulty Describing Feelings (DDF), and Externally Oriented Thinking (EOT)[12]. The challenges in recognizing and expressing emotions may significantly contribute to comprehending the nexus between harassment, cyber victimization, and engagement in internet-related offenses. There exists a plausible correlation between alexithymia and experiences of cyber victimization [13].

It has been suggested that alexithymia, a condition characterized by challenges in identifying and expressing emotions, could potentially arise due to exposure to stressful circumstances [14]. Adolescents subjected to cyberbullying may encounter such stressful situations, which could be perceived as traumatic experiences [15] . The onset of alexithymia symptoms may arise as a response to the stress caused by cyberbullying and victimization. This could serve as a psychological mechanism employed by adolescents to suppress and disregard the distressing emotions triggered by cyberbullying and victimization, as posited by Wachs et al. [13]. Numerous studies have highlighted a significant positive correlation between alexithymia and experiences of cyber victimization [16].

Mindfulness entails being consciously present in the moment, devoid of judgment, and fostering an open acceptance and awareness of emotions and sensations [17]. Past investigations suggest that mindfulness and its associated practices prove efficacious in enhancing awareness, regulating emotions and sensations, and even managing physical conditions [18]. As delineated by Weng et al, mindfulness chiefly operates by heightening awareness of both bodily and brain functions, fostering attention toward bodily sensations and emotions [19]. Engaging in mindfulness to articulate emotions through verbal expression has demonstrated effectiveness. In a study conducted by Liu et al. [20] findings indicated a noteworthy link between increased mindfulness and decreased alexithymia, establishing a significant negative correlation between these two variables [20].

On the other hand, based on some research on cyber victimization among adolescents, some studies suggest that mindfulness emerges as an important variable that can potentially neutralize the negative effects of such experiences. Mindfulness, characterized by an attentive and non-judgmental awareness of the present moment, aids in reducing reactivity to harmful stimuli, enhances emotional regulation, and encourages cognitive reappraisal [21]. These capabilities enable adolescents to manage and reinterpret the stress associated with cyberbullying more effectively, reducing feelings of distress and preventing long-term psychological damage. Empirical studies support mindfulness as a protective factor, showing that adolescents practicing mindfulness report lower levels of stress and are less likely to suffer from the adverse effects of cyber victimization, such as depression and low self-esteem. Therefore, incorporating mindfulness into interventions aimed at addressing cyberbullying could not only diminish the immediate impacts of such experiences but also contribute to healthier emotional and social development during adolescence [22] .

However, none of the retrospective studies have examined these three important determining variables and the interaction between them, which are specifically related to adolescence and determine the future path and adulthood of adolescents. Due to the increase in the use of the Internet and virtual space and the concerns of parents about the destructive effect of this space on their children, in this study, an attempt has been made to examine these very important variables and their impact on teenagers, to be aware of the possible damage of the virtual space on the future of teenagers and their adulthood and the direct impact these people have on the future of society.

The present study aimed to investigate the relationship between alexithymia, mindfulness, and cyber victimization in adolescents using correlation and regression models. In general, this study examines the direct effect of alexithymia on victimization and cyber mindfulness, as well as the direct effect of mindfulness on levels of cyber victimization in adolescents in Zanjan, Iran.

## Method

This study is primarily correlational research that examines the relationships between the variables of "mindfulness," "alexithymia," and "cyber victimization" among adolescents aged 14 to 18 in the city of Zanjan during the 2022-2023 academic year. The main objective of this study is to identify and analyze the correlations between these variables and to explore how several factors influence cyber victimization behaviors in this age group.

In this study, a convenience sampling method was used. In this method, participants were selected from individuals who were easily accessible and voluntarily willing to take part in the study. The sample size was estimated based on the Tabachnick and Fidell formula, which is specifically designed to determine an appropriate sample size for correlational and regression studies. Regarding the choice of convenience sampling method, it is necessary to explain that this decision was made based on operational considerations of the research. Given the limitations in terms of time, human resources, administrative facilities, and access to the entire statistical population, it was used as a common, acceptable, and, of course, inevitable solution in applied and correlational research.

The sample size was estimated based on the Tabachnick and Fidell formula, which is specifically designed to determine an appropriate sample size for correlational and regression studies. In this formula, m is the number of independent variables. Given that there are two independent variables in the present study, the minimum sample size required was estimated to be:$N \geq 50 + 8(2) = 66$

Also, in order to ensure sufficient statistical power, the power of the test (power) was set to 0.80 and the significance level (α) was set to 0.05. However, to increase the generalizability of the results, 380 people were selected as the final sample.

The inclusion criteria were carefully designed to ensure homogeneity and validity within the sample. These criteria included: Age (Only adolescents aged 14 to 18 years) were included in the study. Only individuals who voluntarily agreed to participate in the study and were fully informed about the research objectives were selected. Voluntary participation was emphasized to adhere to ethical principles and ensure informed consent. Participants were required to complete all sections of the questionnaires in full to ensure the data were valid and usable for analysis. Specific exclusion criteria were established to maintain the integrity of the data and prevent systematic errors in the research findings: Incomplete Questionnaire Completion: Individuals who did not complete the questionnaires in full or left sections unanswered due to time constraints or other reasons were excluded from the final analysis. Acute Psychological or Physical Issues: Adolescents suffering from acute mental or physical conditions who were unable to complete the questionnaire accurately were excluded from the study. This was done to maintain the precision and reliability of the data, as health problems may impact the individual's responses. Incomplete or Unusable Data: Participants whose data were incomplete, inconsistent, or unusable for statistical analysis (e.g., illogical or repetitive responses) were removed from the sample. Inconsistent Response Patterns: Adolescents who repeatedly provided unusual or illogical answers, or who intentionally entered false responses, were excluded from the study sample. For example, maximum selection of all options on different scales, identical and repeated responses throughout the questionnaire (such as selecting only the first or last option in all items), or the presence of obvious contradictions between reversed questions, are considered examples of such patterns. Also, regarding incomplete data, any questionnaire with more than twenty percent of its items left unanswered was considered incomplete and was excluded from statistical analysis.

Ethical considerations were carefully observed throughout the study. Informed consent was obtained from all participants as well as from their parents or legal guardians, given the adolescent age group involved. Participation was entirely voluntary, and participants were informed about their right to withdraw from the study at any time without any consequences. Confidentiality was strictly maintained by anonymizing the data; no names or identifying information were recorded, and all responses were coded and stored securely. The study received ethical approval [IR.IAU.CTB.REC.1402.051], by the ethical guidelines for research involving human participants.

Stepwise regression analysis was conducted using SPSS version 27 to examine the relationships between the variables. This method systematically adds or removes predictor variables based on their statistical significance to identify the most significant predictors. Stepwise regression was chosen as the primary method of analysis to identify the most significant predictors among the independent variables. This method is particularly useful when the goal is to build an efficient predictive model by including only those variables that contribute meaningfully to the outcome. In this study, a forward stepwise approach was applied, where predictors were added one at a time based on their statistical significance (typically using an entry criterion of $p < .05$). Variables that did not meet the significance threshold were excluded from the final model, allowing for a more parsimonious and interpretable set of predictors.

The tools used in this study were as follows:

**Mindfulness Questionnaire:** The mindfulness scale comprises 15 questions, which were devised by Brown and Ryan [8].This assessment aims to measure an individual's awareness and attention to ongoing events and experiences in their daily life. Questions within the test evaluate mindfulness on a six-point Likert scale, from 1 denoting "almost always" to 6 indicating "rarely." Score between 15 and 30: The level of consciousness in the individual is low. (Score between 30 and 60: The level of consciousness in the individual is average. Score above 60: The level of consciousness in the individual is high. Scores for mindfulness range between 15 and 90, with higher scores signifying heightened mindfulness. The test questions demonstrated strong internal consistency, with Cronbach's alpha coefficient ranging from 0.80 to 0.87.

The scale's validity is satisfactory. This is supported by its negative correlation with depression and anxiety assessment tools, as well as its positive correlation with instruments measuring positive affect and self-esteem [23]. Furthermore, the retest reliability coefficient of this scale was observed over a fixed interval of one month [24]. In its Persian iteration, this scale was evaluated among a sample of 723 students, yielding a Cronbach's alpha value of 0.81 for the questions, thus affirming its reliability within this population [25]

**Alexithymia Questionnaire:** The Alexithymia Scale was originally formulated in 1985 by Taylor, Raine, and Bagby and comprises 26 questions. Subsequently, in 1994, Bagby, Taylor, and Parker revised it into a 20-question format. In their validation study identified three structural factors within the TAS-20 that corresponded with the emotional ataxia construct. This structural framework has garnered support from additional studies. The Toronto Alexithymia Scale incorporates 20 questions, scored on a five-point Likert scale ranging from 1, denoting "completely disagree," to 5, indicating "completely agree." By summing the scores of the 20 questions, an aggregate score representing the emotional dyslexia scale is obtained. Furthermore, questions 4, 10, 18, and 19 are scored in reverse [26]. Seo et al conducted a study on non-clinical Korean adolescents aged 12-18 years. They reported the reliability of the scale using Cronbach's alpha method as 0.87, indicating consistency within this demographic [27]. Afshari used this scale in a study on a sample of 80 students (40 girls and 40 boys) and reported its reliability using Cronbach's alpha method for the total score of the scale as 0.75, difficulty in recognizing emotions as 0.72, difficulty in describing emotions as 0.73, and extraverted thinking as 0.53. Ghasemi-Nejad also used this scale in a study (78 people) on asthmatic patients and compared it with normal individuals and reported its reliability using Cronbach's alpha method for the total score of the scale as 0.71, difficulty in describing emotions as 0.60, difficulty in recognizing emotions as 0.72, and objective thinking as 0.51.By administering this scale to a sample of 600 people, Cronbach's alpha coefficient was 0.69 for the entire scale, 0.74 for difficulty in recognizing emotions, 0.67 for difficulty in describing emotions, and 0.55 for objective thinking. In the study by Karami-Rad, the reliability of this scale was calculated on a sample of 600 people using the Cronbach's alpha method [28]**.**

**Cyber-Bullying/Victimization Experiences Questionnaire:** The Cyber Victimization-Bullying Experience Questionnaire was developed by Antoniadou et al. as a tool to assess cyberbullying encounters among students. Comprising 24 questions, it encompasses two facets: cyberbullying victims' and cyberbullying perpetrators' experiences. Utilizing a Likert scale, aimed at gauging students' encounters as cyberbullying victims [1]. The Persian iteration of this questionnaire underwent a validity assessment by Basharpoor and Zardi in 2018. Their evaluation concluded that the questionnaire's content, format, and criteria were deemed valid. Moreover, the research reported Cronbach's alpha coefficient exceeding 0.7, affirming the questionnaire's internal consistency [5].

## Results

Upon scrutinizing the gender distribution within the participant pool, it was observed that 195 individuals, constituting 51.3% of the statistical sample, identified as boys, whereas 185 individuals, comprising 48.7% of the statistical sample, identified as girls. The youngest participant enrolled was 14 years old, while the eldest participant was 18 years old. The average age of the participants was calculated to be 16.10 years. Additionally, among the participants, 127 individuals (33.4% of the statistical sample) were first-year students, 171 individuals (45.0%) were second-year students, and 82 individuals (21.6% of the statistical sample) were third-year students. Descriptive statistical analyses were conducted, encompassing central and dispersion indices, examined independently for each variable and component within the dataset.

The table outlines descriptive statistics, including central indicators such as mean and standard deviation. To assess the normality of the data distribution, skewness and kurtosis values were examined. All variables showed skewness values between -2 and +2, and kurtosis values between -7 and +7, which fall within the acceptable thresholds for normal distribution as suggested by previous research. Therefore, it was concluded that the data were approximately normally distributed, justifying the use of parametric statistical methods in the analysis. The research scores reveal the fulfillment of the normality assumption. Moreover, upon examining the data for outliers using box plots, no outliers were detected. Cronbach's alpha method was employed to assess the reliability of the research instruments. The results demonstrated favorable Cronbach's alpha values for the conscious mind questionnaire (0.81), alexithymia (0.76), and cyber victimization (0.77), signifying the reliability of the research tools.

To examine the relationships between the variables, Pearson's correlation coefficient was used in the first step. The results showed that the relationship between mindfulness and cyber victimization was estimated to be ($r = -0.26$, $p = 0.001$, $\alpha = 0.01$**). In addition, the relationship between mindfulness and alexithymia was found to be ($r = -0.41$, $p = 0.001$, $\alpha = 0.01$**). Furthermore, the relationship between alexithymia and cyber victimization was estimated to be ($r = 0.25$, $p = 0.001$, $\alpha = 0.01$**). Based on the correlation matrix table, it is evident that a significant and inverse relationship exists between mindfulness and both alexithymia and victimization. Additionally, a positive, direct, and meaningful relationship is observed between alexithymia and cyber victimization. Following this, stepwise regression analysis was conducted to predict cyber victimization based on mindfulness and alexithymia. Stepwise regression is a statistical method used to build a predictive model by systematically adding or removing predictors based on their significance. In this analysis, mindfulness and alexithymia were entered as independent variables, and

their predictive ability about cyber victimization was assessed.

According to Table 2, step 1 of the regression analysis incorporated alexithymia as the sole predictor, which explained 8.2% of the variance in cyber victimization ($R^2$ = 0.08, p < 0.001). This result indicates that alexithymia has a statistically significant, albeit modest, relationship with cyber victimization. In step 2, the model was expanded by adding mindfulness as a second predictor. This addition increased the total explained variance by 2.1%, bringing the total $R^2$ to 0.103, and the relationship remained statistically significant (p = 0.003). The incremental change in $R^2$ (0.02) reflects the contribution of mindfulness to the model, suggesting that it provides additional explanatory power in predicting cyber victimization beyond alexithymia. Furthermore, the F change statistic (F = 8.99, p = 0.003) indicates that the inclusion of mindfulness significantly improved the model's fit. The Durbin-Watson statistic for the final model was 1.91, which is within the acceptable range, suggesting that the residuals are not highly auto correlated and the assumptions of the regression analysis are met.

**Model 1:** In Step 1, the regression model included alexithymia as the sole predictor. The ANOVA table shows that the model significantly predicts the variance in cyber victimization (F = 33.69, p < 0.001). The sum of squares for regression is 14.06, with the mean square for regression being 14.06. In contrast, the residual sum of squares is 157.80, with a mean square of 0.41. The total variance in the model is 171.87.

**Model 2:** In Step 2, both alexithymia and mindfulness were included as predictors. The ANOVA table shows that the final model significantly improved (F = 21.70, p < 0.001). The sum of squares for regression in this model is 17.74, with a mean square of 8.87. The residual sum of squares for the second model is 154.13, with a mean square of 0.40. The total variance in the model remains 171.87.

The ANOVA results indicate that both models significantly explain the variance in cyber victimization (both with p-values < 0.001). Specifically, the second model, which includes both predictors, explains more variance than the first model. However, even the first model (with only alexithymia) is statistically significant.

The path coefficients from the regression analysis reveal important insights into the relationships between the predictors and cyber victimization. In Model 1, the constant (intercept) is 0.56 (B = 0.56, p < 0.001), indicating the predicted level of cyber victimization when alexithymia is zero. The coefficient for alexithymia is 0.01 (B = 0.01, p < 0.001), with a standardized coefficient (Beta) of 0.28, suggesting that for every one-unit increase in alexithymia, the level of cyber victimization increases by 0.01 units. This positive relationship is statistically significant, with a p-value of 0.0001. In Model 2, where both alexithymia and mindfulness are included as predictors, the constant increases to 1.30 (B = 1.30, p < 0.001), which reflects the predicted level of cyber victimization when both alexithymia and mindfulness are zero. The coefficient for alexithymia in this model is 0.01 (B = 0.01, p < 0.001), with a Beta of 0.21, indicating that while the impact of alexithymia decreases slightly when mindfulness is added, the relationship remains positive and statistically significant (p = 0.0001). The coefficient for mindfulness is -0.008 (B = -0.008, p = 0.003), with a standardized coefficient (Beta) of -0.16, showing a negative relationship with cyber victimization. This suggests that for each one-unit increase in mindfulness, cyber victimization decreases by 0.008 units. This negative relationship is also statistically significant (p = 0.003). The collinearity statistics reveal that multicollinearity is not an issue, with tolerance values above 0.1 and VIF values well below the threshold of 5. Specifically, the VIF for alexithymia is 1.00, and for mindfulness, it is 1.21, indicating that the predictors do not exhibit significant multicollinearity. In conclusion, the results indicate that alexithymia has a positive, significant effect on cyber victimization, whereas mindfulness has a negative, significant effect.

**Table 1.** Descriptive Statistics for Research Variables

| Variable | Minimum | Maximum | M | SD | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Mindfulness | 15 | 109 | 64.57 | 13.04 | -0.52 | 0.55 |
| Alexithymia | 20 | 84 | 54.59 | 11.80 | -0.06 | -0.42 |
| Cyber victim | 24 | 101 | 31.88 | 5.09 | 1.12 | 1.34 |

**Table 2.** Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig F Change | |
| 1 | 0.28 | 0.08 | 0.07 | 0.64 | 0.08 | 33.69 | 1 | 378 | 0.0001 | |
| 2 | 0.32 | 0.10 | 0.09 | 0.63 | 0.02 | 8.99 | 1 | 377 | 0.003 | 1.91 |

**Table 3**. *ANOVA*

| Model | | Sum of Squares | df | Mean Square | F | P |
|---|---|---|---|---|---|---|
| 1 | Regression | 14.06 | 1 | 14.06 | 33.69 | 0.0001 |
| | Residual | 157.80 | 378 | 0.41 | | |
| | Total | 171.87 | 379 | | | |
| 2 | Regression | 17.74 | 2 | 8.87 | 21.70 | 0.0001 |
| | Residual | 154.13 | 377 | 0.40 | | |
| | Total | 171.87 | 379 | | | |

**Table 4**. Coefficients

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | P | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 0.56 | 0.15 | | 3.58 | 0.0001 | | |
| | alexithymia | 0.01 | 0.003 | 0.28 | 5.80 | 0.0001 | 1.00 | 1.00 |
| 2 | (Constant) | 1.30 | 0.29 | | 4.46 | 0.0001 | | |
| | alexithymia | 0.01 | 0.003 | 0.21 | 4.07 | 0.0001 | 0.82 | 1.21 |
| | mindfulness | -.008 | 0.003 | -0.16 | -2.99 | 0.003 | 0.82 | 1.21 |

## Discussion

This study aims to investigate cyber victimization, alexithymia, and mindfulness among adolescents and attempts to demonstrate the significance of the relationships between the variables. The findings indicate a significant correlation between the variables under study. In the context of the study above focus, prior research suggests that individuals involved in cyberbullying frequently encounter challenges in managing their emotions. This struggle with emotional regulation may contribute to a recurring cycle of both perpetrating bullying behavior and experiencing victimization.

Training individuals in mindfulness techniques holds a significant role in regulating emotions effectively. Those with a conscious mind tend to exhibit superior emotion regulation abilities (30). Victims of bullying often grapple with negative self-assessment and a lack of self-acceptance due to the judgments imposed upon them by their aggressors. This experience may lead them to detach from the present moment, contradicting the fundamental principles of mindfulness. Results of the current research show significant negative correlations between mindfulness and both alexithymia and cyber victimization, alongside a positive correlation between alexithymia and cyber victimization. Then, the inverse correlation between bullying and mindfulness might stem from the challenges victims encounter in accepting themselves without judgment an essential facet of mindfulness. Emirtekin et al. [14] conducted a study exploring the interplay among childhood emotional abuse, cyberbullying, and traits associated with emotional intelligence. These findings suggest that interventions based on mindfulness could potentially mitigate cyberbullying incidents and victimization in adolescents who have experienced childhood emotional abuse [14]. In a recent investigation by Zhao et al, the study explored the correlation between cyberbullying victimization and non-suicidal self-injury among Chinese adolescents. This comprehensive study amalgamated various theories and identified emotional reactivity as a pivotal mediator while highlighting mindfulness as a potential moderator. The researchers concluded that mindfulness plays a critical role in moderating the connection between cyberbullying incidents and non-suicidal self-harm. Thus, emphasizing the enhancement of mindfulness becomes crucial in shielding against the adverse impacts of cyberbullying [29] Furthermore, noteworthy retrospective research, such as the study conducted by Sepehri et al. identified a significant and inverse correlation between awareness and cyber victimization. This indicates that individuals with lower levels of awareness face heightened susceptibility to cyber victimization and its accompanying negative repercussions [30]. Additionally, studies have shown that mindfulness training for adolescents can effectively mitigate bullying and cyber victimization, underscoring a substantial and negative correlation between mindfulness and cyber victimization [29]. Marsha Linhall's definition emphasizes two significant impacts of the conscious mind: acceptance and non-judgment. By introducing mindfulness exercises to teenagers, they can acquire awareness regarding their automatic interpretations of negative emotions in various situations. This heightened awareness potentially serves as a preventive measure against them becoming captives of their own emotions [20]. As per Hogeveen and Grafman's conceptualization, alexithymia delineates a condition where individuals encounter difficulties in processing emotional information and regulating their emotions. This multifaceted condition poses challenges for people in identifying their emotions and discerning physical sensations arising from emotional arousal [20]. Referring to Segal and et al. elucidation of mindfulness, it is posited that a negative and significant correlation might exist between alexithymia and mindfulness. This proposition stems from Segal's suggestion that individuals practicing mindfulness tend to heighten their awareness of emotions, daily activities, and automatic thought processes derived from both past experiences and future contemplations [31].

Engaging in mindfulness practices involve being in tune with thoughts, and feelings, including physical sensations. Many studies have found mindfulness to be effective among adolescents who are experiencing cyber victimization and are affected by levels of emotional alexithymia. Emotion regulation involves being aware of and understanding emotions, accepting them, and having the ability to control impulsive behaviors [11]. However, individuals who engage in mindfulness cultivate intentional awareness in every moment and demonstrate the ability to accept their emotions without judgment. This nonjudgmental awareness is beneficial in emotion regulation [16].

Our goal is to increase awareness in this area to prevent potential harm caused by the Internet for adolescents, including mental disorders that can jeopardize their future. The findings obtained from this research could be useful in various mindfulness-based therapies and potentially reduce the adverse effects of emotional alexithymia and cyber victimization on adolescents' lives. This intervention holds promise in preventing the continuation of these detrimental effects into adulthood, thereby protecting their educational and professional activities.

The present study carries certain limitations that warrant consideration. Firstly, the study's sample size was confined to students from a single city, thereby potentially impeding the generalization of the results to broader populations. Secondly, the questionnaire employed in the study encompassed a substantial number of questions, which did compromise the accuracy of the responses provided. Researchers are encouraged to examine the effectiveness of mindfulness therapy on a variety of variables in the adolescent population, while also considering the importance of alexithymia in adolescence and its effects on the adolescent psyche in their research. Educational initiatives aimed at adolescents should prioritize the teaching of mindfulness techniques and guide safe navigation in cyberspace, highlighting its potential dangers. In addition, adolescents should be educated on the effective expression of their emotions and feelings.

## Conclusion

Based on the research findings, it is evident that mindfulness, cyber victimization, and alexithymia have a significant relationship with each other. It is recommended that future studies explore this area further and examine the effectiveness of mindfulness interventions in helping individuals affected by cyber victimization.

## Conflict of Interest

All authors involved in this research declare no conflicts of interest.

## Ethical Approval

The project was found to be in accordance to the ethical principles and the national norms and standards for conducting Medical Research in Iran.
Approval ID:IR.IAU.CTB.REC.1402.051
https://ethics.research.ac.ir/IR.IAU.CTB.REC.1402.051

## Declaration of Generative AI and AI-Assisted Technologies

During the preparation of this work, the authors used a questionnaire and SPSS software to collect data. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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