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Structural Model of Cyberbullying Based on Stressful Life Events, Family Emotional Atmosphere and Empathy: The Mediating Role of Loneliness in Adolescents

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ABSTRACT

Objective: The purpose of the present study was to propose a structural model of cyberbullying, which is based on stressful life events, family emotional atmosphere, and empathy, with the inclusion of loneliness as a mediator.

Methods: The research design employed in this study was descriptive-correlational. The target population consisted of all second-year high school students in Marand city (Iran) in 2023, totaling 8000 individuals. A sample size of 310 participants was determined using Klein's rule, and selected using multi-stage cluster sampling. Data were collected through Antoniadou Cyberbullying Questionnaire (2016), Russell loneliness Questionnaire (1996), Byrne et al. Adolescent Stress Questionnaire (ASQ), Hillburn Family Emotional Atmosphere (1964), and Jolliffe and Farrington Basic Empathy Scale (2006). Data analysis was conducted using the path analysis method via SPSS-28 and AMOS-24 software.

Results: The findings revealed a favorable fit between the proposed research model and the collected data. Upon analyzing the results, it was discovered that the direct impact of family emotional atmosphere and empathy on cyberbullying was found to be negative and statistically significant. On the other hand, the direct effect of loneliness on cyberbullying was positive and statistically significant. However, no significant relationship was observed between stressful life events and cyberbullying. Furthermore, the results indicated that loneliness played a significant mediating role in the relationship between stressful life events, family emotional atmosphere, and empathy with cyberbullying.

Conclusions: In conclusion, the results suggest that cyberbullying may be indicative of a low level of family emotional atmosphere and empathy, as well as a high level of loneliness. Psychologists and educational counselors should give advice on improving the emotional atmosphere of the family and teaching empathy skills and giving advice to parents to prevent cyberbullying in teenagers.

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Introduction

Adolescence, recognized as one of the developmental stages, is commonly referred to as the emerging domain of risk-taking. Due to adolescents' limited understanding of the connection between their actions and their consequences, they are highly prone to various problems including emotional, behavioral and adjustment problems (Zhu et al., 2021). A fundamental issue and concern during this phase are the phenomenon of bullying which is defined as aggressive conduct or recurring deliberate harm accompanied by physical and psychological consequences within an interpersonal connection (Olweus, 1993). With the advancement of communication domains and the emergence of novel interactive opportunities (Erişti & Akbulut, 2019), a contemporary form of bullying has superseded traditional bullying, labeled as cyberbullying. Cyberbullying is done with the aim of insulting, humiliating and harming others in cyberspace and through social media, and due to the disappearance of time and place limitations, anonymity and power imbalance between the bully and the victim, from Traditional bullying is more dangerous (Donat et al., 2023).The prevalence of cyberbullying varies due to disparities in the accessibility of information and communication technologies across different regions of the world (Mohammadi et al., 2019). In fact, the Digital Civility Index in 2020, based on a sample of 16,051 individuals from 32 countries, reported that 10% of the global population fell victim to cyberbullying (Varela et al., 2022). Considering that approximately one-third of internet users worldwide are children and adolescents, one of the potential negative ramifications of their internet usage is entanglement in bullying activities.

According to research, stressful life events (Geng & Lei, 2021), family emotional atmosphere (Arató et al., 2022), empathy (Hinduja & Patchin, 2022), and loneliness (Varela et al., 2022) exert an influence on cyberbullying. One of the variables associated with cyberbullying is the occurrence of stressful life events. Stressful life events pertain to unfortunate and traumatic occurrences that individuals encounter in their day-to-day lives, including during their educational and occupational pursuits (Geng & Lei, 2021). Numerous investigations have demonstrated that certain environmental factors, such as childhood maltreatment (Wang et al., 2019), as well as familial factors like morality, expressiveness, stability, and cohesion (Martínez-Monteagudo et al., 2019), and exposure to stressful life events (Gao et al., 2022; Geng & Lei, 2021), can serve as predictors of cyberbullying. Adolescents who encounter a higher number of stressful events are more prone

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to engaging in delinquent behaviors, experiencing negative emotions, displaying depressive symptoms, exhibiting impulsivity and aggression, expressing negativity towards their own mistakes, and engaging in problematic Internet usage, all of which can heighten the risk of cyberbullying (Song et al., 2020).

Among the other variables associated with Cyberbullying is the emotional atmosphere within the family. The emotional atmosphere of the family pertains to the interpersonal interactions and emotional relationships among family members, which exert an influence on students' adaptation (Bayanfar et al., 2022). According to the principles of family therapy, the recognition of behaviors and social adaptation within the family setting represents the most crucial environment for early socialization, as it significantly impacts the present and future lives of adolescents (Machimbarrena et al., 2019). A negative emotional atmosphere among family members prompts adolescents to spend more time engaging with the Internet as a substitute for or protest against familial interactions, while also fostering a propensity towards hostility, antisocial behavior, and cyber-violence (Gomes-Franco e Silva & Sendín-Gutiérrez, 2014). Conversely, a positive emotional atmosphere among family members and positive and empathetic family communication serves as protective factors that diminish the risk of engaging in virtual behaviors (Buelga et al., 2017). The findings of Arató et al. (2022) research have demonstrated that the emotional atmosphere within the family constitutes a significant factor influencing teenagers' involvement in cyberbullying.

Another variable associated with cyberbullying is empathy. Empathy refers to the capacity to comprehend and share the emotional circumstances of others, as well as to place oneself in the position of others. It encompasses both emotional and cognitive empathy (Hall & Schwartz, 2019). Cognitive empathy entails the ability to understand and acknowledge the emotional state of others, while emotional empathy involves the ability to share the emotions of others and respond appropriately to them (Chiu & Yeh, 2018). High levels of empathy have been linked to positive developmental outcomes, more adaptive interpersonal and social relationships, reduced aggressive behavior, more positive peer relationships, and less psychological harm (Fabris et al., 2022). According to Zych et al. (2019), children who engage in cyberbullying may lack empathy and fail to feel remorse for their victims, generally exhibiting lower levels of empathy. Also, studies show that empathy as the key to positive social relationships with others, especially when suffering is involved, has a protective role against loneliness and leads a person to create social relationships

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with others. Loneliness is an unpleasant and distressing subjective state that arises from perceived deficiencies in one's social relationships (Larrañaga et al., 2016). Perlman and Peplau (1981) assert that loneliness occurs when an adolescent perceives a disparity between their actual social relationships and their desired social relationships. Furthermore, adolescence is a prominent period for experiencing loneliness (Matthews et al., 2022). In adolescents who have weak social connections within their families, the experience of loneliness can serve as a risk factor for becoming a victim of cyberbullying. This is because these teenagers often rely on social media as a means to alleviate their feelings of loneliness (Estévez et al., 2014). Prior research has indicated that stressful life events (Larrañaga et al., 2016), a negative emotional atmosphere within the family (Favotto et al., 2017), and low levels of empathy (Beadle, 2016; Zych et al., 2019) contribute to feelings of loneliness in adolescents.

Numerous studies have demonstrated significant associations among the variables under investigation. In a meta-analytic study, Machimbarrena et al. (2019) determined that certain family-related variables, such as the emotional atmosphere within the family, play a role in both perpetrating and being a victim of Cyberbullying. Geng and Lei (2021) found that exposure to stressful life events is positively related to engaging in Cyberbullying. The research findings of Hinduja and Patchin (2022) revealed that adolescents who possess a heightened sense of empathy demonstrate a diminished likelihood of engaging in acts of aggression towards others. A review of the literature related to cyberbullying shows that studies in Iran have focused more on examining the psychological effects of cyberbullying on the individual and the role of social factors separately. Therefore, this study simultaneously examines individual, social and situational factors in the field of cyber bullying with a multi-faceted approach. On the other hand, research in the field of cyberbullying shows that this issue is increasing rapidly, so more and more extensive research in this field seems necessary. Also, this study can help reduce cyberbullying and maintain healthy relationships in society by emphasizing emotional and social relationships in individuals and families and their role in preventing cyberbullying. Since it is very important to identify the factors affecting the occurrence of cyberbullying in teenagers; Therefore, investigating the impact of some variables including stressful events in life due to its deep effects on social and emotional relationships, the role of the emotional atmosphere of the family in the formation of social behaviors of adolescents and empathy as The important psychological factor in understanding and

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feeling the emotional state of others on cyberbullying can be very important and to better understand the protective factors against cyberbullying, determine effective strategies to prevent this phenomenon, provide support to help the victims and determine effective solutions to deal with it; Therefore, the current research was conducted with the aim of presenting a structural model of cyberbullying based on stressful life events, emotional atmosphere of the family and empathy with the mediation role of loneliness.

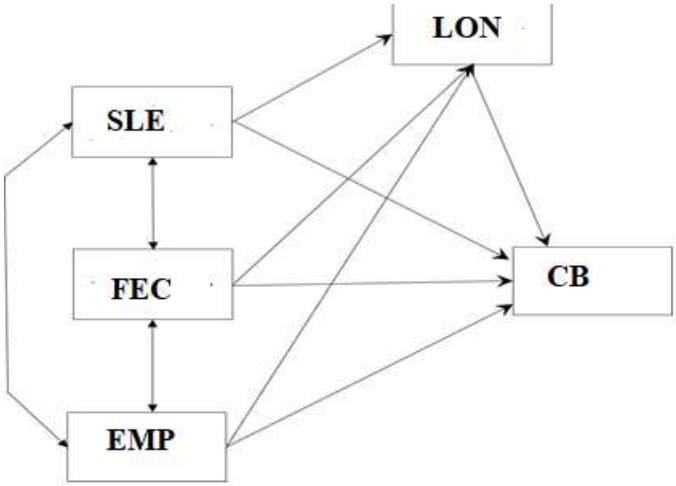


Figure 1. The conceptual model of study
SLE = stressful life events, LON = loneliness, FEC= family emotional atmosphere, EMP= empathy, CB= cyberbullying

Material and Methods

The present research method was descriptive-correlational and the relationships between the variables of the proposed model were analyzed using the path analysis method. The statistical population of the research included all the second year high school students of Marand city in 2023 in the number of 8000 people. According to Kline (2012), 10 or 20 samples are necessary for each variable, but a minimum sample size of 200 is defensible. Based on this, 340 members of the sample were tested through Klein's method in this research, and after removing the distorted questionnaires, the sample was reduced to 310 people. The sampling method was multi-stage cluster random. In this way, five schools (three boys' schools and two girls' schools) were randomly selected from the secondary schools of Marand city, and then two classes (35 people in each class) were randomly selected to participate in the research. After getting the permission from the

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regional education and getting the consent of the participants, the research tools were provided to the students. The participants were assured about the voluntary participation in the research and the confidentiality of the information with the researcher. The inclusion criteria involved: studying in the second secondary level, informed consent to participate in the research and access to virtual space. The exclusion criteria included not being satisfied with participating in the research, other educational levels, and not having access to virtual space. In order to test the hypothesized model, AMOS-24 software was used and SPSS-28 software was used for the descriptive findings of the research.

Instruments

Cyberbullying Questionnaire (CBVEQ): Antoniadou et al. (2016) have designed a cyberbullying questionnaire aimed at evaluating cyberbullying-victim in students. This scale has 24 items and two subscales of victim of cyberbullying and cyberbullying, each subscale includes 12 items, and the scoring method of this questionnaire is a five-point Likert scale several times a week (5), once a week (4), two Three times a month (3), once twice a month (2) and never (1). The range of scores of the questionnaire will be between 24 and 120, and the higher the sum of the obtained scores, the higher the cyber bullying-victim. Antoniadou et al. (2016) obtained the reliability of the questionnaire using Cronbach's alpha coefficient of 0.89 for cyberbullying and 0.80 for cyber victimization and reported the factor analysis of the questionnaire using the root mean square error index of approximately 0.031. Beshrpour and Zardi (2018) obtained the reliability of the questionnaire using the test-retest method for cyber bullying 0.63 and cyber victim 0.69. In this study, the Cronbach's alpha coefficient of this scale was 0.91.

Family Emotional Atmosphere Questionnaire (FEAQ): The Family Emotional Atmosphere Questionnaire was created by (Hillburn, 1964 quoted from Heydari and Danshi, 2015) in order to measure the level of affection in parent-child interactions. This questionnaire has 16 items on a five-point Likert scale (1 very low, 2 low, 3 medium, 4 high, and 5 very high) and eight subscales including: affection, caressing, confirming, shared experiences, giving gifts, encouraging to trust and feel safe. Odd questions measure the degree of father-child emotional bond and even questions measure mother-child emotional bond. In the research of Arghabaei et al. (2018) to investigate the psychometric properties of this questionnaire on the Iranian population, its internal consistency was obtained using Cronbach's alpha 0.85, split-half 0.77 and Guttman's 0.77. Also, the construct

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and concurrent validity of this questionnaire has been confirmed. Akbari Borang and Gavamirad (2015) reported the reliability of this questionnaire using Cronbach's alpha calculation method as 0.90 for the whole scale and 0.85 for the subscales of father's emotional atmosphere and mother's emotional atmosphere. In the present study, the reliability coefficient was obtained using Cronbach's alpha, 0.92.

Basic Empathy Scale (BES): This scale was created by Jolliffe and Farrington (2006) to evaluate the cognitive-emotional empathy of young people and teenagers and has 20 items. The emotional subscale has 11 items and the cognitive subscale has 9 items. This questionnaire is a five-point Likert scale (1 completely disagree to 5 completely agree). In Jolliffe and Farrington's study, the Cronbach's alpha coefficient was 0.92 for the whole scale, and 0.85 for the emotional subscale and 0.76 for the cognitive subscale. Also, in the research of Aghajani et al. (2021), the Cronbach's alpha coefficient was 0.88, which indicates the good reliability of the questionnaire. In this study, Cronbach's alpha coefficient was 0.76.

Adolescent Stress Questionnaire (ASQ): This scale was created by Byrne et al. (2007) and includes 56 items and 10 subscales (home life stress, school performance stress, romantic relationship stress, school-related stress, peer pressure stress , the stress of relations with the teacher, the stress of uncertainty about the future, the stress of the conflict between homework and enjoyable activities, the stress of financial pressure and the stress of the emergence of adult responsibilities). A five-point Likert scale was used to score this questionnaire. In the research conducted by Moksnes et al. (2010) on teenagers, they reported good internal consistency between the subscales of this questionnaire, so that the Cronbach's alpha value of its subscales was between 0.70 and 0.89. and its total internal homogeneity, 0.97 obtained. Ghasemi Navab (2016) in examining the psychometric properties of the Persian version of this questionnaire in Iranian high school students, reported its reliability between 0.75 and 0.85 in ten subscales and its concurrent validity was 0.82. In this study, Cronbach's alpha coefficient was 0.96.

Loneliness Questionnaire (UCLA-LS): Russell et al. (1978) prepared the first revised version of the loneliness scale based on a 75-item scale, taking into account the opinions of several psychologists. The third version of this scale was created by Russell (1996). This tool measures a person's dissatisfaction with social relationships in two dimensions: lack of intimate relationships and lack of social relationships. This self-reporting scale is made of 10 items with a positive load

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and 10 items with a negative load, and the answers to the items are specified in a four-point Likert scale from 1 (never) to 4 (often). The minimum score indicating the absence of loneliness is 20 and the maximum score indicating loneliness is 80. Russell et al. (1980) reported the internal consistency of this scale as 0.94. Hojat (1982) obtained the Cronbach's alpha coefficient of 0.89 in Iranian students living in America and 0.88 in Iranian students living in Iran in order to investigate the psychometric properties of the renewed feeling of loneliness scale. In Deshiri et al. (2008) research, Cronbach's alpha coefficient was reported between 0.75 and 0.88.

Results

In terms of demographic characteristics, 16.3% of the research sample was in the 10th grade, 7.3% in the 11th grade, and 76.3% in the 12th grade. Also, the average age of the students was 17.6 years with a standard deviation of 0.75. Also, 42% of the participants were girls and 58% were boys. Table 1 shows the descriptive statistics of the research variables. Table 2 shows the correlation matrix of research variables.

Table 1. Descriptive statistics of research variables

Variable	Mean	SD	Max.	Min.	Range
Cyberbullying	40.73	7.99	62	25	37
Loneliness	43.90	12	76	21	55
Stressful life events	129.36	35.84	232	48	184
Family emotional atmosphere	51.07	15.66	80	16	64
Empathy	61.30	9.20	82	39	43

Table 2. Correlation matrix of research variables

Variable	Cyberbullying	Loneliness	Stressful life events	Family emotional atmosphere
Cyberbullying	1			
Loneliness	0.28**	1		
Stressful life events	0.04	0.18**	1	
Family emotional atmosphere	-0.23**	-0.29**	0.02	1
Empathy	-0.12**	-0.19**	0.21**	0.14*

The results of Table 2 show that the relationship between cyberbullying and loneliness is positive and significant (r=0.28) at the level of (p<0.01). However, there is a negative and significant relationship between cyberbullying and the emotional atmosphere of the family (r= -0.23) at the level (p<0.01). Also, the relationship between empathy and cyberbullying is negative and

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significant (r=-0.12) at the level of (p<0.01). There is no significant relationship between cyberbullying and stressful life events.

Before testing the structural model, the assumptions of univariate and multivariate normality of the research indicators and the assumption of multiple non-collinearity and linearity of the variables were examined. The assumption of normality was checked using the Kolmogorov Smirnov test and the skewness and kurtosis index of the observed variables. The significance level of the Kolmogorov-Smirnov test for all research indicators was greater than 0.05; As a result, all research indices had a normal distribution. Also, the values of skewness and kurtosis related to all the observed variables were less than ±2, which shows that the distribution of none of the observed variables is significantly different from the normal distribution. In addition, the assumption of multivariate normality was checked and since the kurtosis index was 2.86 and the critical ratio of this index (2.13) was lower than the critical value of 2.56, it can be concluded that the multivariate normal distribution has a large deviation was not acceptable and the default multivariate normality was confirmed. Multiple co-collinearities of predictor variables were also investigated using tolerance index and variance inflation factor. The calculated tolerance value for loneliness, stressful life events, family emotional atmosphere and empathy were obtained as 0.63, 0.70, 0.56 and 0.58, respectively, which was higher than 0.10, also the value of the factor Variance inflation was 1.60, 1.44, 1.79 and 1.71, respectively, which was lower than the value of 10 and indicates the realization of the assumption of multiple non-collinearities between variables. Finally, the linearity of the relationship between the variables of the research was checked through the analysis of the scatter matrix and the scatter diagram of the residuals, and the results showed that this assumption was linear and fulfilled.

Table 3. Results of model fit indices

Indices	Symbol	Optimal value	Obtained value	Result
Comparative	CFI	> 0.90	0.95	Confirmed
	NFI	> 0.90	0.92	Confirmed
Incremental	RMSEA	< 0.08	0.069	Confirmed
Absolut	GFI	> 0.90	0.92	Confirmed
	AGFI	> 0.80	0.88	Confirmed
	df/x^2	< 3	2.49	Confirmed

According to the results of Table 3, the structural model of the research was tested using the path analysis method. In this model, it is assumed that stressful life events, emotional atmosphere of

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the family and empathy predict cyberbullying both directly and through the mediation of loneliness. Examining the fit indices obtained from the structural model test of the research showed that the fit indices indicate the appropriate fit of the model. (x/df2 = 2.490, CFI = 0.950, GFI = 0.918, AGFI = 0.879 and RMSEA = 0.069). Considering that at least three indicators have values in the acceptable range, we can claim that the fit of the model is good and acceptable.

Table 4. Coefficients and significance of the direct effect of research variables

Path	Beta	C.R	Estimate error	P
Stressful life events on feelings of loneliness	0.17	3.14	0.01	0.002
The emotional atmosphere of the family on the feeling of loneliness	-0.35	-5.97	0.01	0.001
Empathy on loneliness	-0.16	-3.08	0.03	0.002
Stressful life events on cyberbullying	-0.05	-0.88	0.04	0.37
The emotional atmosphere of the family on cyberbullying	-0.19	-2.76	0.04	0.006
Empathy on cyberbullying	-0.24	-3.39	0.10	0.001
Loneliness on cyberbullying	0.18	2.73	0.15	0.006

Based on the results of Table 4, the effect of stressful life events on loneliness is positively significant, and the effect of family emotional atmosphere and empathy on loneliness is negatively significant at the level ($p<0.01$). The emotional atmosphere of the family and empathy have a significant negative effect at the level ($p<0.01$) on cyberbullying. Also, the effect of the mediator variable of loneliness on the criterion variable, i.e. cyberbullying, is also significant at the level ($p<0.01$). Among the obtained coefficients, only the direct effect coefficient of stressful life events on cyberbullying is not significant.

Table 5. Coefficients and significance of indirect effect of research variables

Predictor	Mediator	Criterion	Beta	Sobel test value	p
Stressful life events	Loneliness	Cyberbullying	0.031	2.04	0.041
The emotional atmosphere of the family	Loneliness	Cyberbullying	-0.063	2.49	0.013
Empathy	Loneliness	Cyberbullying	-0.30	2.05	0.04

Based on the results of Table 5, Sobel's method was used to investigate the mediating role of loneliness. The results of the Sobel test showed that the loneliness variable has a significant mediating role and has been able to play a meaningful mediating role between stressful life events and cyberbullying, family emotional atmosphere and cyberbullying, and between empathy and cyberbullying. ($p<0.05$).

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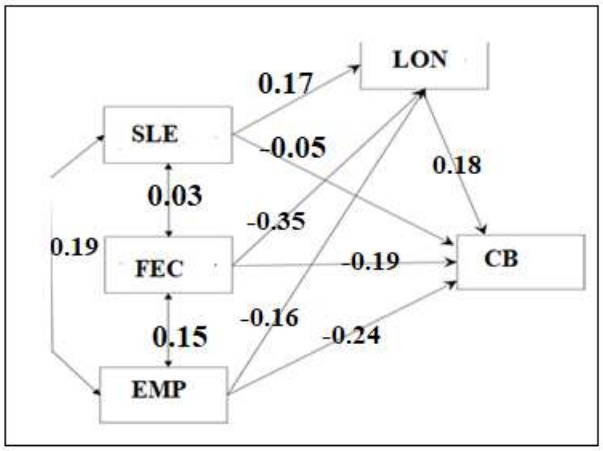


Figure 2. Path coefficients of research variables

Discussion

The aim of this study was to establish a structural model of Cyberbullying that is based on the occurrence of stressful life events, the emotional dynamics within the family, and the level of empathy, while considering the mediating role of loneliness. Additionally, the study aimed to assess the fit of the proposed model and examine the direct and indirect relationships among the variables. The proposed model was evaluated using the path analysis method, and the results indicated a satisfactory fit of the model. It was found that all direct paths, except for the path between stressful life events and Cyberbullying, as well as all indirect paths, were statistically significant.

The findings of this study revealed a significant negative relationship between the emotional atmosphere within the family and cyberbullying. This finding aligns with the results reported by Machimbarrena et al. (2019) and Buelga et al. (2017). In interpreting this finding, it can be argued that the family serves as the primary context for the socialization of both boys and girls, where they learn the norms of behavior and coexistence. The emotional atmosphere within the family encompasses the relationships between parents and children, characterized by trust, affection, and approval. According to Satir's approach to family therapy (Banmen, 2002), parents ought to create a conducive emotional atmosphere that allows for open communication and emotional expression among family members, thus fostering a sense of acceptance and trust. In families that possess such an atmosphere, the likelihood of cyberbullying is reduced. Numerous studies have demonstrated that families characterized by a positive emotional atmosphere also exhibit cohesion,

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social support, trust, and empathetic communication among their members. Furthermore, a positive emotional atmosphere within the family influences teenagers' attitudes toward social norms and behaviors, making them less prone to engaging in bullying behaviors (Pérez, 2017). Pettit et al. (1997) research indicates that teenagers who grow up in a positive family environment tend to be more responsive to their parents' wishes and expectations. This indirect social control exerted by families helps prevent their children from violating rules, including those related to internet usage. Conversely, a weak emotional atmosphere among family members, coupled with an absence of secure relationships characterized by communication issues, conflicts, parental limitations, and neglect, may render teenagers more vulnerable to, or involved in, bullying. The presence of a weak emotional atmosphere, coupled with a lack of trust, love, and understanding of emotions, can contribute to aggressive behavior among teenagers.

According to the research conducted by Romero-Abrio Gomes-Franco e Silva and Sendín-Gutiérrez (2014), it has been observed that a lack of emotional connection within the family environment compels adolescents to seek solace in cyberspace. This is done in an attempt to compensate for the absence of interpersonal relationships, affection, and to express their discontent towards their parents. Consequently, spending more time online exposes them to increased opportunities of either perpetrating or experiencing cyberbullying.

Another significant finding of this study pertains to empathy, where the results indicate a negative correlation between empathy and cyberbullying. These findings align with the conclusions drawn by Hinduja and Patchin (2022) as well as Del Rey et al. (2016). In explaining this finding, it can be said that empathy is a fundamental characteristic of human personality that facilitates social interactions and interpersonal communication in at least two separate states: First, it is an inherent and multidimensional emotional empathy that includes the ability to pay attention, feel, and respond automatically to others and understanding the emotional states of others. People with low empathy may pay less attention to others and show less empathy and sympathy in response to others' emotional states. Also, because these people cannot see the real faces or emotions of others in cyberspace, they feel that they can bully them without fear of their physical or emotional reaction. Second, cognitive empathy requires more conscious reflection, makes it possible to understand people's feelings and consider them, and as an essential part of social behavior, it supports strategic social interactions and communication and altruistic behavior. Therefore,

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empathetic people are able to understand and share the suffering of the victims, they can put themselves in their place and refrain from bullying behaviors. Also, adolescents who have low cognitive empathy may be unable to understand and recognize the feelings of others, which causes them to react incorrectly to others in real and cyber space and bully. People with low cognitive empathy cannot have positive and healthy interactions with others due to their inability to accept the opinions and feelings of others, so they turn to bullying behaviors in cyberspace due to anonymity.

The findings of this research pertaining to stressful life events reveal that there is no significant relationship between such events and Cyberbullying. This finding contradicts the conclusions reached by Geng and Lei (2021). An explanation for this disparity lies in the fact that the tool employed to measure stressful life events in this study failed to differentiate between controllable and uncontrollable stress. It is important to note that certain teenagers may actively create stressful environments due to their personality traits, while others may actively avoid such situations. Adolescents who experience controllable stressful events are less inclined to engage in Cyberbullying as compared to those who encounter uncontrollable stressful events. Thus, the perception of stressful life events plays a crucial role in influencing the results, as evident in the sample utilized in this research. Moreover, it is worth mentioning that stressful life events can lead to isolation in some individuals while inciting aggression and ultimately cyberbullying in others. Consequently, one's personality traits also have a significant impact on the occurrence of Cyberbullying (Wang, 2022).

The research findings indicate a significant correlation between feelings of loneliness and Cyberbullying. It can be argued that one of the primary motivations for students to engage in virtual activities is to address social and psychological issues, such as loneliness (Rezaei Kalantari & Eftekhari Kanzari, 2019). When teenagers feel lonely, they are likely to find alternative ways to make social connections. These ways may include daily internet surfing and frequent use of online interactive services. Also, students who feel lonely are more likely to exchange frequent messages with virtual friends who may participate as victims/bullies in unpleasant online experiences such as cyberbullying. Feeling alone may cause a decrease in self-confidence in teenagers. As a result, they engage in cyberbullying to gain power and control over others in order to make themselves strong and noticed by harming others. On the other hand, the feeling of loneliness reaches its peak

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during adolescence and teenagers want to expand their presence on social networks in order to reduce the feeling of loneliness. Such students often look for social support in virtual networks, and they attack and attack the people who, in their opinion, have caused social exclusion and loneliness.

The limitations of the present study were the use of retrospective self-reporting tools, which may be prone to random or incorrect answers and affect the willingness to disclose cyberbullying and, as a result, the validity of questionnaire responses. Therefore, it is suggested to use objective tools such as observation and interview to increase credibility in future research. Also, the statistical population of this research is second year high school students, which limits the generalization of the results of this research. As a result, to increase the generalizability of the findings, diverse samples should be used in future studies. Another limitation of this research was the use of a cross-sectional design, which limits the ability to draw conclusions about the long-term effects of variables. Therefore, it is suggested that longitudinal research be used in future research that provides more insight into cyberbullying, loneliness, and their predictors. Considering the impact of technology on the experiences of teenagers, the importance of parent-child relationships, and the role of empathy in reducing cyberbullying, it is suggested that programs be designed by counselors and psychologists.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Farhangian University.

Author contributions

This research was derived from the master's degree thesis of the first author of the article, which was conducted at Allameh Amini Campus in Tabriz. All authors contributed to the study conception and design, material preparation, data collection and analysis and contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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