

## Research Paper

# The Relationship Between Internalizing Syndromes and Morbid Curiosity and Cyber Aggression in Adolescents



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## ABSTRACT

**Background:** Adolescence is a period marked by biological, psychological and behavioral changes, which evoke intense emotional responses in teenagers. The aim of this study was to investigate the relationship between internalizing syndromes and morbid curiosity, and cyber aggression among adolescents.

**Methods:** The study population included all male and female middle and high school students in District 3 of Tehran during the academic year 2021-2022. A statistical sample of 375 individuals was randomly selected through cluster sampling. The research utilized the cyber aggression scale for adolescents by Alvarez-Garcia cyber aggression scale for adolescents, the Achenbach and Edelbrock internalizing syndromes scale and the scrivener morbid curiosity scale. Data analysis was conducted using SPSS software, version 26 and AMOS software, version 24.

**Results:** The results showed a significant structural relationship between internalizing syndromes and cyber aggression, as well as between morbid curiosity and cyber aggression. However, internalizing syndromes and morbid curiosity accounted for only 4.8% of cyber aggression.

**Conclusion:** These findings have implications for adolescent counseling, psychotherapy, education, training and correctional and rehabilitation centers.

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## Introduction

Adolescence is a period marked by biological, psychological and behavioral changes, which evoke intense emotional responses in teenagers [1]. Among these reactions, high-risk behaviors, such as violence and problematic cyber behaviors are prevalent [2]. Cyber aggression, a focus of recent research, plays a significant role in various mental health issues, hostile actions and substance use disorders. It is defined as a new form of aggressive behavior facilitated by Internet development, involving the intentional use of the Internet and mobile phones to harm others [3-5]. Studies have reported cyber aggression prevalence ranging from 15% to 65% across different countries [6, 7]. These actions can lead to physical, social, and educational consequences [8, 9], with severe cases resulting in the symptoms of anxiety, depression, stress, and loneliness in victims [10, 11]. Therefore, understanding the influential factors and psychological mechanisms behind cyber aggression in adolescents is essential to uncover protective factors that can mitigate such behaviors.

In this context, one influential factor contributing to cyber aggression in adolescents is mental health issues [12]. Among the predisposing factors for aggression, externalizing disorder is often cited. Recently, it has been suggested that internalizing syndromes, including social withdrawal, anxiety, depression and somatic complaints, can also be associated with cyber-aggressive behaviors. Internalizing syndromes include the manifestation of behaviors and internal problems that are characterized by symptoms, such as social withdrawal, anxiety, depression, and physical complaints in a person [12, 13]. Additionally, research on cyber-aggressive behavior in women indicates that these individuals often harbor internalized anger and exhibit externalized aggression; the expression of internalized fear, despair and anger frequently leads to impulsive aggressive behavior. Subsequently, following episodes of aggression, these individuals report feelings of anxiety and ultimately, a combination of anger, anxiety, and impulsivity ends up damaging their self-esteem and relationships [14]. While the relationship between externalizing syndromes and cyber aggression has received significant attention from researchers, further investigation into the link between internalizing and aggression, particularly cyber aggression, is warranted. Therefore, this study aimed to explore the relationship between these two variables.

On the other hand, a notable psychological factor influencing aggression is physiological arousal, with mor-

bid curiosity standing out as a significant contributor to heightened physiological arousal [15]. Morbid curiosity encompasses an intrigue towards objects, death, violence, or other unsettling events, often leading to potential physical or emotional harm. While it is a natural inclination, it can stimulate certain behaviors and preferences [16]. Defined as a blend of excitement, fear, and compulsion, morbid curiosity intensifies the urge to delve into distressing subjects [17, 18]. Consistent with this, Harrison and Frederick [19] assert that individuals display heightened attention and physiological reactions toward negative phenomena compared to positive ones. Physiological responses include increased activity in the frontal lobe, limbic and paralimbic systems, and autonomic nerves. Considering that both aggression and pathological curiosity are often caused by perceived danger, there is a possibility of correlation and similarity between these two factors. Consequently, this study aimed to explore the connection between morbid curiosity and cyber aggression. Moreover, morbid curiosity represents a cognitive process drawing individuals' attention toward life's perilous aspects, with the intention of arming themselves through information gathering and understanding related factors in hazardous situations [16]. This fixation fosters prolonged attention to harmful stimuli and heightened vigilance, both of which are recognized risk factors for anxiety and depression, constituting components of internalizing syndromes [20].

Considering the previously mentioned points and the research that shows the difference in the underlying factors of cyber aggression compared to traditional aggression [21], it is very important to conduct separate studies to identify factors related to cyber aggression. Furthermore, given the widespread access to the Internet, all societies, including Iranian society, face particular risks. Thus, addressing cyber aggression through the perspective of relevant psychological factors seems essential. Considering these considerations, the primary research question is whether there is a structural relationship between cyber aggression and internalizing syndromes on the one hand and pathological curiosity on the other.

## Materials and Methods

This study is a correlational investigation targeting all students (both male and female) enrolled in middle and high schools in District 3 of Tehran in the academic year 2021-2022, totaling 15300 individuals. The sample size was determined to be 375 using Cochran's formula and the participants were selected using Random cluster sampling. Initially, a number of schools and subsequently, several classes within District 3 of Tehran were ran-

domly chosen and students were assessed after obtaining informed consent. Moreover, to uphold ethical standards, the research objectives were clarified, participants entered the study with informed consent, and they were informed of the voluntary participation in the research.

## Tools

For data collection, the following tools were utilized: 1) Cyber aggression scale for adolescents (CYBA): Developed and validated by Álvarez-García et al. [22], the CYBA comprises 19 items and assesses four components of cyber aggression, including identity theft aggression (3 items), visual-sexual aggression (3 items), verbal and exclusion aggression (9 items), and additional aggression components, including mocking-imagery and sharing violent videos (4 items). Adolescents were asked to indicate the frequency of experiencing the described aggression via mobile phone or the Internet in the past three months. Responses were recorded on a four-point Likert scale (one = never to four = always). The reliability coefficients for the three main components of the scale were reported as follows: Identity theft (0.87), visual-sexual cyber aggression (0.79) and verbal and exclusion aggression (0.91). The overall scale reliability coefficient was reported as 0.92, based on administration to 3148 adolescents aged 12 to 18 years [23]. In this study, Cronbach's  $\alpha$  for the scale ranged from 0.75 to 0.87 for the subscales, with an overall scale  $\alpha$  of 0.89; 2) Internalizing syndromes scale: The adolescent behavioral problems form is a self-assessment tool designed for individuals aged 11 to 18, which is completed within 15 minutes by adolescents with at least a fifth-grade primary education. This scale assesses both internalization and externalization syndromes [24]. The syndrome section comprises 112 items, with 32 items measuring internalization, including subscales, such as social withdrawal, somatic complaints, and depression/anxiety [25]. Respondents indicate their condition by marking a number on a three-point scale (0, 1, 2) corresponding to their experience. The reliability of the scales through re-testing with a one-week interval has been reported between 0.3 and 0.6 and with a seven-month interval between 0.47 and 0.81 [26]. Standardization studies have been conducted in Iran, with re-test reliability coefficients calculated as 0.92 for the entire test, 0.90 for the internalization scale and 0.89 for the externalization scale in a study involving adolescents. The internal consistency coefficients in this study were calculated as 0.94 for the overall scale, 0.82 for the externalization scale, and 0.91 for the internalization scale [27]. In this research, Cronbach's  $\alpha$  was calculated between 0.82 and 0.89 for the subscales; 3) Morbid curiosity scale: Developed by scrivener [16] to measure

morbid curiosity, this scale consists of 24 items. Respondents rate the extent to which the items correspond to their condition on a six-point scale (one = completely disagree to six = completely agree). The scale includes subscales focusing on attention to dangerous people, impairment of physical integrity, supernatural hazards and interpersonal violence. In four studies conducted by the creators of the scale, the re-test reliability coefficients for the subscale of attention to dangerous people, rare hazards, impairment of physical integrity and interpersonal violence were 0.86, 0.84, 0.81 and 0.80 and Cronbach's  $\alpha$  for the subscales of attention to dangerous people, supernatural hazards, impairment of physical integrity, and interpersonal violence were calculated as 0.92, 0.90, 0.87 and 0.89, respectively. These results indicate that this scale has satisfactory validity and reliability. Confirmatory factor analysis of this scale was examined in the research by Ghaemi et al. [28] and the fit indices of this scale were evaluated as acceptable. In this study, the Cronbach's  $\alpha$  for the subscales of attention to dangerous people, impairment of physical integrity, supernatural hazards, interpersonal violence, and the overall scale were calculated as 0.83, 0.87, 0.91, 0.89 and 0.92, respectively.

To collect the data, after coordination with the school management, the objectives and implementation method were determined, and then the scales were personally distributed to the subjects. Each participant responded to the scales individually, a process lasting approximately 30 minutes, after which the scales were collected.

The data obtained from the scales underwent analysis using SPSS software, version 26 and AMOS software, version 24. Descriptive statistics, Pearson's correlation coefficient, and structural equation modeling were used for data analysis.

## Findings

After reviewing the research variables and selected scales, as well as scrutinizing their psychometric properties (validity, reliability and normativity in Iranian society), a statistical analysis of the research data was conducted.

Demographically, the age, gender, and educational level of the participants were assessed. The mean age of the participants was  $15.54 \pm 1.73$  years and their ages ranged from 13 to 19 years. Among the participants, 208(54.2%) were male, and 176(45.8%) were female. There were 197 middle school students (first level) and

**Table 1.** Descriptive findings of research variables

Variables	Subscales	Mean±SD
Internalizing syndromes	Anxiety/Depression	18.65±4.17
	Depression/Isolation	16.17±2.55
	Somatic complaints	19.92±2.59
	Total score	54.75±6.18
Morbid curiosity	Interpersonal violence	20.44±7.18
	Physical integrity impairment	21.69±5.84
	Attention to dangerous people	19.31±6.39
	Supernatural hazards	18.63±6.75
	Total score	80.09±17.69
Cyber aggression	Identity theft	7.77±2.03
	Visual-sexual cyber violence	8.29±1.83
	Verbal and exclusion violence	25.34±4.14
	Mocking and sharing violent videos	11.24±2.15
	Total score	52.65±6.70

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187 high school students (second level) among the participants.

**Table 1** presents the descriptive statistics of the research variables and their subscales. **Table 1** reports the Mean±SD of the data to provide an overall comprehension.

As indicated in **Table 1**, all subscales except for the anxiety/depression subscale exhibited moderate Mean±SD. Additionally, absolute values of skewness and kurtosis of variables were less than three and ten, respectively, indicating a normal data distribution [29]. Therefore, according to **Table 1**, the research data are considered normal, allowing for the application of parametric tests, such as Pearson correlation and covariance-based structural equations.

Considering that the correlation between variables forms the primary basis for structural equations, Pearson correlation among the research variables was calculated before conducting structural equations. The correlation between variables is detailed in **Table 2**. As depicted in **Table 2**, certain variables exhibited a significant relationship with each other, while others did not. Furthermore, the highest correlation coefficient was 0.42, indicating

a moderate correlation, and there was no significant inverse relationship between the research variables. Moving forward, before presenting the results of the structural equations, the fit indices of the model will be provided. This step ensures that if the model fits appropriately, the path coefficients can then be reported. **Table 3** displays the fit indices of the developed model.

As shown in **Table 3**, the reported fit indices are satisfactory and acceptable, indicating that the model developed by the researchers has a suitable fit. Furthermore, the graphical representation of the research model is depicted in **Figure 1**.

In the concluding part of the findings section, the path coefficients and the significance of the relationships between variables are reported. To accomplish this, the method of maximum likelihood was utilized to compute the path coefficients and establish the significance of the relationships. These values are outlined in **Table 4**.

Based on the findings presented in **Table 4**, it can be concluded that the significance level of the structural relationship between internalization and cyber aggression was 0.048, which was <0.05, indicating a significant relationship between these variables. Similarly, the signifi-

**Table 2.** Pearson correlation between research variables

Research Variables	1	2	3	4	5	6	7	8	9	10	11
Anxiety/Depression	1										
Depression/Isolation	0.03	1									
Somatic complaints	0.18**	0.21**	1								
Interpersonal violence	0.10*	0.07	0.05	1							
Physical integrity impairment	-0.03	-0.01	0.06	0.10*	1						
Attention to dangerous people	0.14**	0.03	0.07	0.41**	0.32**	1					
Supernatural hazards	0.13**	0.10*	0.03	0.30**	0.03	0.42**	1				
Identity theft	0.14**	0.02	0.04	0.02	0.06	0.10*	0.04	1			
Visual-sexual cyber violence	0.12*	0.02	0.08	0.05	0.09	0.10*	0.06	0.29**	1		
Verbal and exclusion violence	0.05	0.04	0.06	0.10*	0.07	0.06	0.04	0.09	0.22	1	
Mocking and sharing violent videos	0.07	0.01	0.06	0.11*	0.07	0.10*	0.06	0.16**	0.22**	0.28**	1

\*P<0.05, \*\*P<0.01.

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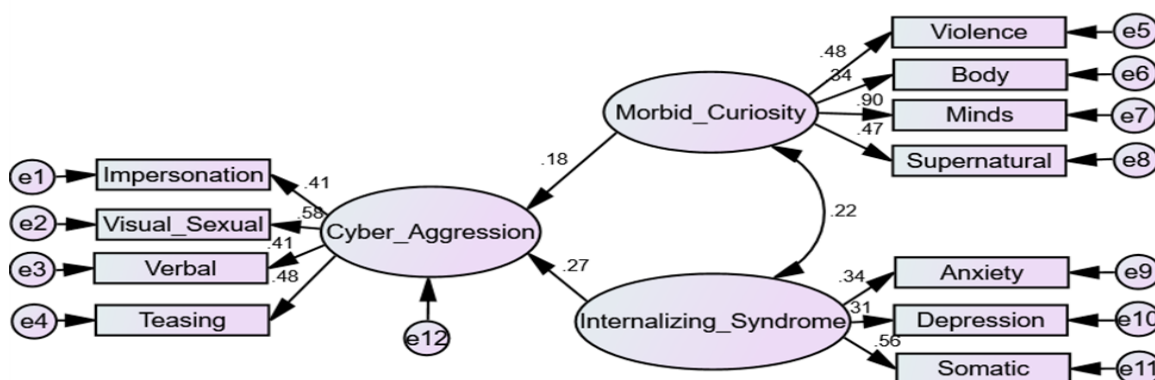
cance level for the structural relationship between morbid curiosity and cyber aggression was 0.042, which was <0.05, thus indicating significance. Therefore, the research hypotheses are confirmed. Furthermore, through multiple linear regression analysis, the coefficient of determination for predicting cyber aggression based on internalizing syndromes and morbid curiosity was calculated. It was determined that these two variables, internalizing syndromes and morbid curiosity, account for only 4.8% of cyber aggression.

As a supplementary finding, gender differences in cyber aggression are reported at the end of the findings section, as detailed in Table 5.

As indicated in Table 5, there was no significant difference between boys and girls in any of the subscales of cyber aggression.

### Discussion

The primary objective of the current research was to propose a structural model of cyber aggression based on internalizing syndromes and morbid curiosity among



**Figure 1.** The final model

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**Table 3.** Fit indices for the developed model

Fit Indices	Obtained Value	Acceptable Value
CMIN	56.76	-
DF	41	-
CMIN/DF	1.38	<3
GFI	0.97	>0.95
AGFI	0.95	>0.95
PCFI	0.71	>0.9
PNFI	0.63	>0.6
IFI	0.95	>0.9
TLI	0.93	>0.9
CFI	0.95	>0.95
RMSEA	0.032	<0.08

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Abbreviations: CMIN: Normalized chi-square; DF: Degree of freedom; CMIN/DF: Chi-square to degree of freedom ratio; GFI: Goodness of fit index; AGFI: Adjusted goodness of fit index; PCFI: Parsimonious fit index; PNFI: Parsimonious normed fit index; IFI: Incremental fit index; TLI: Tucker-Lewis index; CFI: Comparative fit index; RMSEA: Root mean square error of approximation.

students. The initial finding of this study revealed a significant effect of internalization on cyber aggression, with an estimated standardized value of 0.26. This outcome aligns with prior research conducted by Gini et al. [4] Holfeld and Mishna [30] Brown et al. [31] Holfeld and Sukhawathanakul [32] and Trumpeter et al. [33]. One plausible explanatory model for this finding is the symptom-driven model [34]. According to this model, adolescents experiencing anxiety or depression (symptoms of internalization) often exhibit behaviors deviating from accepted societal norms. This deviation may lead to heightened conflicts, especially with peers, acting as a potential trigger for aggression [30]. Another potential explanation is the violence exchange model, which suggests that adolescents living in violent social environments prioritize self-defense when faced with violence.

The persistent struggle and tension encountered by these adolescents within their social surroundings can intensify feelings of anxiety or depression and increase their tendency to engage in aggressive behaviors [35].

The second finding of the research revealed that the effect of morbid curiosity on cyber aggression was significant, with a standardized path coefficient of 0.17. This finding is innovative and somewhat consistent with the findings of Yoo [21]. One potential explanation for this finding is grounded in the theory of operant conditioning. According to this theory, aggression, like other behaviors, is influenced by punishment and reward [36]. Morbid curiosity, by offering rewards, could increase the likelihood of cyber aggression. Within morbid curiosity, one of the rewards arises from the knowledge acquired

**Table 4.** Path coefficient and significance of the relationships between variables

Paths	B	$\beta$	SE	CR	P
Internalizing <sup>®</sup> cyber aggression	0.15	0.26	0.08	1.97	0.048
Morbid Curiosity <sup>®</sup> cyber aggression	0.04	0.17	0.02	2.03	0.042

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Abbreviations: CR: Critical ratio; SE: Standard error;  $\beta$ : Standardized estimate; B: Unstandardized estimate.

**Table 5.** Comparison of scores between boys and girls in cyber aggression

Variables	Gender	Mean±SD	Sum of Squares	df	Mean Squares	F	P
Identity theft	Boys	7.81±1.94	0.98	1	0.98	0.23	0.627
	Girls	7.71±2.13					
Visual-sexual cyber aggression	Boys	8.38±1.94	3.76	1	3.67	1.09	0.297
	Girls	8.19±1.69					
Verbal and exclusion violence	Boys	25.71±4.10	61.38	1	61.38	3.59	0.059
	Girls	24.90±4.16					
Mocking and sharing violent videos	Boys	11.06±2.30	13.87	1	13.87	3.01	0.083
	Girls	11.44±1.93					

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from potentially harmful information, which might empower individuals to better safeguard themselves [37] and resort to aggression if deemed necessary. Another potential explanation is rooted in Glasser's concept of basic needs, one of which is the need for survival [38]. According to this theory, humans inherently seek to live and feel secure [39]. Morbid curiosity can lead to heightened attention and increased awareness of potential dangers [37]. This function of morbid curiosity aligns with the function of aggression, which is self-protection during crises. Therefore, by depicting situations as perilous, morbid curiosity may increase the probability of various forms of aggression, including cyber aggression.

A supplementary finding of the research indicated that there was no significant difference in any of the subscales of cyber aggression between boys and girls. This finding aligns with that of Grading et al. and Wright and Lee [40, 41], but contrasts with those of Huang and Chou, Erdur-Baker and Wang et al. [42-44], which have shown higher levels of cyber aggression among boys. Additionally, this research contradicts findings from studies that have found higher levels of cyber aggression among girls, such as Bauman et al. and Rivers and Noret [45, 46]. The absence of significant differences in cyber aggression between boys and girls could be attributed to variations in school structures, the extent of Internet usage, the level of interaction with peers and differences in the types of cyber aggression exhibited by boys and girls [47, 48].

## Conclusion

This study had several limitations that require consideration. The cross-sectional nature of the research restrict-

ed its ability to make causal inferences. Although there is a mounting body of empirical research supporting the findings of this study, longitudinal studies are essential to offer additional validation. Additionally, the sample was restricted to adolescents in middle and high schools in District 3 of Tehran; thus, caution must be exercised when generalizing the results to other regions, ethnicities and age groups. Additionally, the data relied on self-reported assessments, which could introduce bias. Alternative reporting methods, like interviews with parents and teachers, could offer additional insights, but they might lack oversight of the adolescent's online experiences during the day and night. The current findings highlight the importance of screening for adolescents who might exhibit internal symptoms or external problems. Lastly, it is advisable to investigate the relationship between these variables and environmental factors in childhood, such as childhood maltreatment.

## Ethical Considerations

### Compliance with ethical guidelines

This study was approved by the Ethics Committee of [Azarbaijan Shahid Madani University](#) (Code: IR.AZARUNIV.REC.1402.008). The individuals' information was kept confidential. Participants completed the informed consent form, before entering the study.

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### Authors' contributions

Conceptualization and supervision: Fakhrossadat Gho-reyshy Rad; Methodology: Marzieh Jabarian; Data collec-tion: Marzieh Jabarian; Data analysis: Behzad Shalchi; Investigation and writing: All authors.

### Conflict of interest

The authors declared no conflict of interest.

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