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The Mediating Role of Internet Addiction in the Relationship Between Self-Control and Aggression in Individuals with Anxiety Disorders

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A B S T R A C T

Purpose: The objective of this study was to examine the mediating role of internet addiction in the relationship between self-control and aggression among individuals diagnosed with anxiety disorders.

Methodology: This cross-sectional study involved 220 individuals diagnosed with anxiety disorders, selected through purposive convenience sampling from psychiatric clinics in Tehran in 2023. The primary data were collected using three standardized questionnaires: Young's Internet Addiction Questionnaire (2009), Buss and Perry's Aggression Questionnaire (1992), and Tangney's Self-Control Scale (2004). The data were analyzed using structural equation modeling (SEM) via AMOS software version 23 to assess the direct and indirect effects of self-control on aggression, with internet addiction as the mediator.

Findings: The results indicated a significant negative direct effect of self-control on aggression ($\beta = -0.22$, $p = 0.008$) and on internet addiction ($\beta = -0.29$, $p = 0.001$). Additionally, a significant positive direct effect of internet addiction on aggression was observed ($\beta = 0.46$, $p = 0.001$). The mediation analysis confirmed that internet addiction significantly mediated the relationship between self-control and aggression, indicating that individuals with lower self-control were more likely to develop internet addiction, which in turn increased their levels of aggression.

Conclusion: The findings suggest that internet addiction plays a crucial mediating role in the relationship between self-control and aggression in individuals with anxiety disorders. Interventions targeting internet addiction and enhancing self-control may be effective strategies for reducing aggression in this population. These results underscore the importance of a holistic approach in treating anxiety disorders, addressing both self-regulatory capacities and maladaptive coping mechanisms.

Keywords: *Internet addiction, aggression, self-control, anxiety.*

1. Introduction

The relationship between self-control, aggression, and internet addiction has garnered increasing attention in psychological research, particularly in the context of anxiety disorders. Anxiety disorders, which encompass a range of conditions including generalized anxiety disorder (GAD), social anxiety disorder (SAD), and panic disorder, are among the most prevalent mental health issues globally (Cao et al., 2023). These disorders are characterized by excessive fear and worry, which can significantly impair daily functioning and quality of life. Research indicates that individuals with anxiety disorders often struggle with self-regulation, which can manifest as difficulties in managing emotions, behaviors, and impulses (Eriksson et al., 2023; Ofem et al., 2024). This dysregulation can lead to maladaptive behaviors such as aggression and addiction, particularly in vulnerable populations.

Self-control, defined as the ability to regulate one's emotions, thoughts, and behaviors in the face of temptations and impulses, is a critical factor in psychological well-being (Hatamian & Ghorbani, 2016; Pechorro et al., 2020). High self-control is associated with numerous positive outcomes, including better academic performance, healthier relationships, and lower levels of substance abuse (Pechorro et al., 2020). Conversely, low self-control is linked to a range of negative outcomes, such as increased aggression and susceptibility to addictive behaviors, including internet addiction (Pechorro et al., 2021).

Internet addiction, a relatively new phenomenon in the field of psychology, has become a significant concern due to the pervasive use of the internet and digital devices in daily life. Internet addiction is characterized by excessive and compulsive use of the internet, leading to social, occupational, and psychological impairments (Jeong et al., 2018). It has been found to correlate with various psychological issues, including anxiety, depression, and aggression (Tan et al., 2022). The addictive nature of the internet, particularly social media and online gaming, can exacerbate these conditions, creating a vicious cycle that is difficult to break.

Aggression, a complex behavior that can be both reactive and proactive, is often observed in individuals with anxiety disorders (Cassiello-Robbins et al., 2015). Reactive aggression is typically a response to perceived threats or frustration, while proactive aggression is more calculated and goal-oriented (Goshayeshi et al., 2024; Murray et al., 2018). The presence of anxiety can heighten sensitivity to threats, leading to increased aggression, particularly in situations where individuals feel cornered or helpless (Cooley et al., 2017; Herawati et al., 2024; Öztop et al., 2024). Additionally, the inability to effectively regulate emotions, as seen in low self-control, can further fuel aggressive behaviors.

The interplay between anxiety, aggression, and self-control is particularly evident in individuals with anxiety disorders. For instance, research has shown that individuals with higher levels of anxiety are more likely to exhibit aggressive behaviors, particularly if they also have low self-control (Scott & Weems, 2014). This relationship is further complicated by the presence of internet addiction, which can both result from and contribute to low self-control and high aggression (Jeong et al., 2018). Internet addiction often serves as a maladaptive coping mechanism for individuals with anxiety, providing temporary relief from anxiety symptoms while simultaneously exacerbating issues related to self-regulation and aggression (Piao et al., 2022).

Previous research has highlighted the importance of understanding the underlying mechanisms that link these variables, as this knowledge can inform the development of more effective interventions for anxiety-related aggression and internet addiction (Faretta & Farra, 2019). By focusing on a clinical population diagnosed with anxiety disorders, this study seeks to contribute to the growing body of literature on the complex interactions between anxiety, self-control, aggression, and internet addiction. Several studies have examined the relationship between anxiety and aggression, often focusing on the role of emotion regulation and self-control. For example, Eriksson et al. (2023) found that self-control is inversely related to symptoms of anxiety and depression, suggesting that individuals with better self-control are less likely to experience these symptoms (Eriksson et al., 2023). Similarly, research by Pechorro et al. (2020) demonstrated that self-control mediates the relationship between anxiety and aggression, highlighting the protective role of self-regulation in mitigating aggressive behaviors (Pechorro et al., 2020). These findings suggest that interventions aimed at enhancing self-control could be beneficial in reducing both anxiety and aggression.

In addition to self-control, internet addiction has emerged as a significant factor in the relationship between anxiety and aggression. Jeong et al. (2018) found that adolescents with internet gaming disorder exhibited higher levels of aggression and anxiety compared to their peers without the disorder (Jeong et al., 2018). This finding is consistent with the work of Tan et al. (2022), who reported that internet

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addiction is associated with increased impulsivity, aggression, and anxiety among various types of drug users (Tan et al., 2022). These studies suggest that internet addiction may serve as both a consequence of low self-control and a contributing factor to increased aggression and anxiety.

The potential for internet addiction to exacerbate aggression and anxiety is particularly concerning given the widespread use of digital devices and the internet. As noted by Piao et al. (2022), the addictive nature of online platforms, particularly social media and gaming, can lead to excessive use that disrupts daily functioning and exacerbates psychological issues. This is especially true for individuals with pre-existing anxiety disorders, who may turn to the internet as a way to cope with their symptoms, only to find that their addiction worsens their overall mental health (Piao et al., 2022).

Given the complex relationships between self-control, internet addiction, and aggression, it is crucial to examine these variables within the context of anxiety disorders. The current study builds on previous research by exploring the mediating role of internet addiction in the relationship between self-control and aggression in a clinical population diagnosed with anxiety disorders. The current study aims to explore the mediating role of internet addiction in the relationship between self-control and aggression among individuals with anxiety disorders.

2. Methods and Materials

2.1. Study Design and Participants

The present study is applied in terms of its objective and analytical in terms of data collection, specifically a correlational study employing structural equation modeling (SEM) or causal modeling. The statistical population of this study consists of all individuals who visited psychiatric clinics in Tehran in 2023 and were diagnosed with one of the anxiety disorders by the respective psychiatrist. Given that a minimum sample size of 200 is sufficient for structural equation modeling studies, a sample size of 220 was considered to ensure the reliability of the results. The participants were selected through purposive convenience sampling.

2.2. Measures

2.2.1. Internet Addiction

This questionnaire is one of the most reliable tests for assessing Internet addiction, developed by Young (2009). It consists of 20 items aimed at measuring the level of Internet addiction in different individuals. Responses are provided on a 5-point Likert scale (ranging from "rarely" to "always"). The overall score of the questionnaire ranges from 20 to 100, where higher scores indicate a higher level of Internet addiction and vice versa. This standardized questionnaire has been validated, with a Cronbach's alpha of 0.90 reported by Cao et al. (2007). The Persian version of this scale has also been used in Iran, with a Cronbach's alpha reliability of 0.81 to 0.88 (Darasian Salmasi & Rezakhani, 2019).

2.2.2. Aggression

The revised version of this aggression questionnaire, initially titled the Hostility Questionnaire, was reviewed by Buss and Perry (1992). This self-report instrument includes 29 items and four subscales: Physical Aggression (9 items), Verbal Aggression (5 items), Anger (7 items), and Hostility (8 items). Participants rate each item on a 5-point Likert scale. Items 9 and 16 are reverse scored. The total score for aggression is obtained by summing the scores of the subscales. The questionnaire has acceptable validity and reliability, with test-retest reliability coefficients for the four subscales (over a 9-week interval) ranging from 0.72 to 0.80, and correlations between the subscales ranging from 0.38 to 0.49. Internal consistency was assessed using Cronbach's alpha, yielding the following results: Physical Aggression ($\alpha = 0.82$), Verbal Aggression ($\alpha = 0.81$), Anger ($\alpha = 0.83$), and Hostility ($\alpha = 0.80$) (Khazaie, 2023).

2.2.3. Self-Control

This scale was developed by Tangney et al. (2004) to assess the level of self-control in individuals as a trait. The original version of this instrument had 35 items, but a short form with 13 items was later provided, yielding a single total score. Scoring is on a 5-point Likert scale, ranging from 1 (not at all like me) to 5 (very much like me). Items 2, 3, 4, 5, 7, 9, 10, 12, and 13 are reverse scored. Therefore, the minimum and maximum possible scores on the entire questionnaire range from 13 to 65, with higher scores indicating greater self-control. Tangney et al. (2004) conducted normative studies on two separate samples, with Cronbach's alpha coefficients of 0.83 and 0.85 obtained in

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the two groups (Tangney et al., 2018). In Iran, Serafraz et al. (2020) reported a reliability coefficient of 0.81 for this scale. Additionally, Rafiee Honar and Janbozorgi (2010) reported the validity and reliability of the test with a Cronbach's alpha of 0.89 (Safikhni Gholizadeh et al., 2024).

2.3. Data Analysis

The research hypotheses were analyzed using linear regression within path analysis, utilizing AMOS software version 23.

3. Findings and Results

Descriptive statistics for the study variables are presented in Table 1.

Table 1

Descriptive Statistics of Research Scales

Subscale	Mean	Standard Deviation	Skewness	Kurtosis
Physical Aggression	25.85	4.11	0.03	-1.22
Verbal Aggression	15.41	4.06	0.32	-1.14
Anger	19.47	3.93	0.51	-0.95
Hostility	22.08	4.56	0.81	-0.51
Aggression	82.81	10.72	0.25	-0.70
Self-Control	36.03	6.23	-0.57	-0.94
Internet Addiction	61.56	11.51	1.16	0.61

The results in Table 1 indicate that the skewness and kurtosis indices fall within the acceptable range of -2 to +2. The results of the model in the standardized state, along with some of the most important model fit indices for the initial model, are presented in Figure 1 and Table 2.

Table 2

Model Fit Indices

Index	Value	Acceptable Threshold
χ^2/df	2.90	Less than 3
RMSEA (Root Mean Square Error of Approximation)	0.08	Less than 0.10
CFI (Comparative Fit Index)	0.95	Greater than 0.90
NFI (Normed Fit Index)	0.94	Greater than 0.90
GFI (Goodness of Fit Index)	0.96	Greater than 0.90
AGFI (Adjusted Goodness of Fit Index)	0.94	Greater than 0.90

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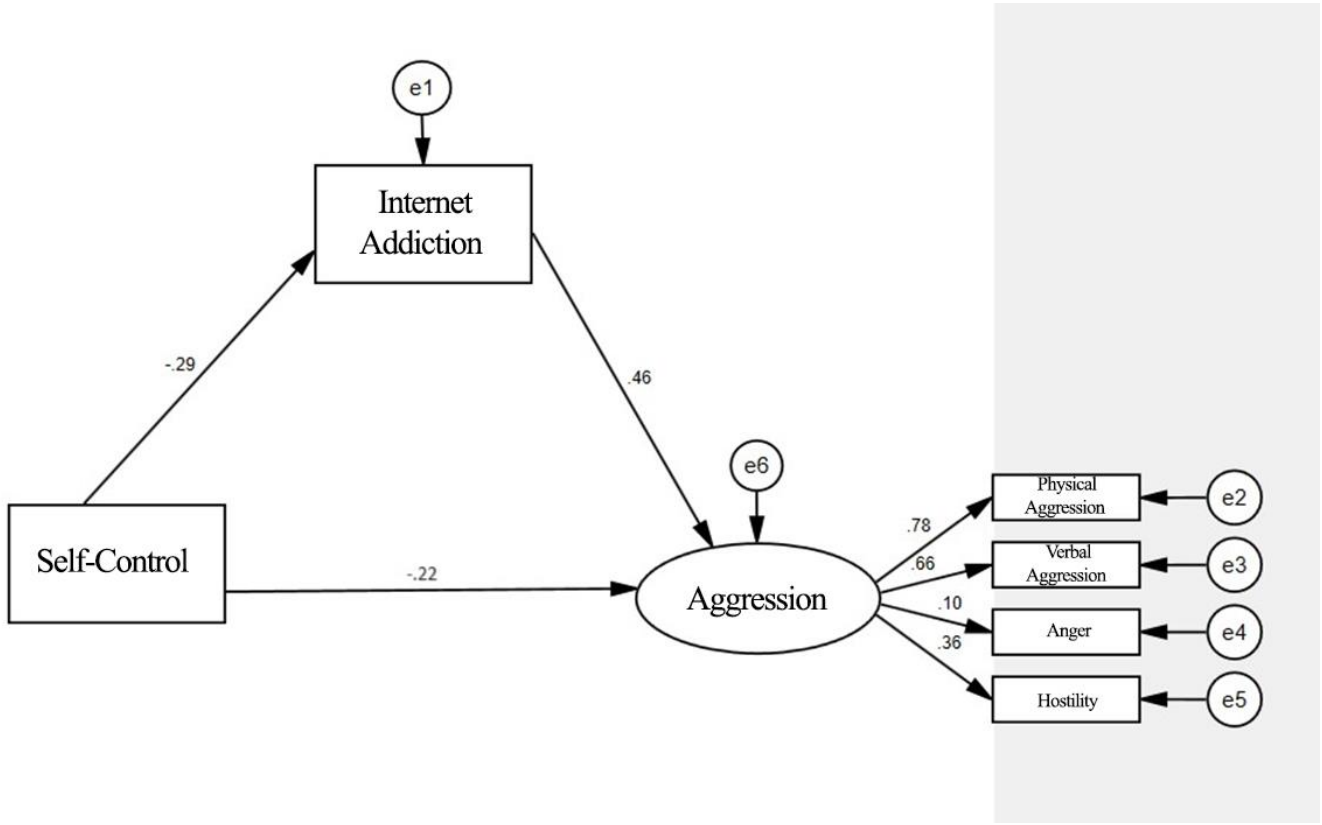
Figure 1

Model in the Standardized Coefficients State



In general, when working with AMOS, none of the indices obtained alone justify the fit or lack of fit of the model, and these indices should be interpreted collectively. The obtained values for these indices indicate that the overall model has an appropriate status for explanation and fit.

Table 3

Coefficients and Significance of the Direct Effect of Self-Control on Aggression

Predictor Variable	Criterion Variable	Type of Effect	Standardized β	Significance	Sig.
Self-Control	Aggression	Direct	-0.22	-2.63	0.008
Self-Control	Internet Addiction	Direct	-0.29	-3.19	0.001
Internet Addiction	Aggression	Direct	0.46	4.56	0.001

As shown in Table 3, the research hypothesis is confirmed, and self-control has a significant negative direct effect on aggression ($p < 0.05$). This means that with increased self-control, the level of aggression decreases. Additionally, the results show that another research hypothesis is confirmed, and self-control has a significant negative direct effect on Internet addiction ($p < 0.05$). This means that with increased self-control, the level of Internet addiction decreases ($p < 0.05$). Finally, the results indicate that another research hypothesis is confirmed, and Internet addiction has a significant positive direct effect on aggression ($p < 0.05$). This means that with increased Internet addiction, the level of aggression increases ($p < 0.05$).

4. Discussion and Conclusion

The current study explored the mediating role of internet addiction in the relationship between self-control and aggression in individuals diagnosed with anxiety disorders. The results provide important insights into the complex interplay between these variables, particularly in the context of anxiety-related behaviors. Specifically, the findings demonstrated that self-control has a significant negative direct effect on both aggression and internet addiction.

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Additionally, internet addiction was found to have a significant positive direct effect on aggression, indicating that individuals with higher levels of internet addiction are more likely to exhibit aggressive behaviors. Moreover, internet addiction was confirmed as a mediator in the relationship between self-control and aggression, suggesting that low self-control may lead to higher internet addiction, which in turn, exacerbates aggressive tendencies.

These results align with previous research indicating that self-control is a critical factor in regulating aggressive behaviors and addiction. Pechorro et al. (2021) found that low self-control is strongly associated with a higher propensity for aggression and delinquency in youth, underscoring the importance of self-regulation in managing antisocial behaviors. The current study's findings extend this understanding to a clinical population with anxiety disorders, highlighting the role of self-control not only in direct aggression but also in behaviors such as internet addiction that may further fuel aggression. This suggests that interventions aimed at enhancing self-control could be particularly effective in reducing aggression by also addressing associated addictive behaviors (Pechorro et al., 2021).

The mediating role of internet addiction in the relationship between self-control and aggression is particularly noteworthy. This finding supports the notion that internet addiction serves as a maladaptive coping mechanism for individuals with low self-control, particularly those who struggle with anxiety disorders. As Jeong et al. (2018) have shown, adolescents with internet gaming disorder, a form of internet addiction, are more likely to exhibit aggressive behaviors. This is consistent with the current study's findings, which suggest that internet addiction exacerbates aggression in individuals with anxiety disorders (Jeong et al., 2018). Moreover, the study by Tan et al. (2022) further supports this relationship, demonstrating that internet addiction is associated with increased impulsivity, aggression, and anxiety among drug users, indicating that the interplay between these variables is not limited to one specific population but may be a broader psychological phenomenon (Tan et al., 2022).

Furthermore, the relationship between anxiety, self-control, and aggression is well-documented in the literature. For instance, Scott and Weems (2014) reported that higher anxiety levels are associated with increased aggression, particularly in individuals with lower self-control (Scott & Weems, 2014). The current study corroborates these findings by showing that individuals with anxiety disorders who exhibit low self-control are more likely to develop internet addiction, which in turn, increases their aggression levels. This underscores the importance of addressing both anxiety and self-control in therapeutic settings to mitigate aggressive behaviors.

The significant negative effect of self-control on internet addiction observed in this study is also consistent with existing research. Pechorro et al. (2020) highlighted the protective role of self-control in preventing addictive behaviors, including internet addiction (Pechorro et al., 2020). The current study extends these findings by showing that this protective effect of self-control is particularly important in individuals with anxiety disorders, who may be more susceptible to internet addiction due to their need for escape and coping mechanisms. This suggests that interventions aimed at strengthening self-control could be an effective strategy for reducing internet addiction in this population.

Additionally, the significant positive direct effect of internet addiction on aggression observed in this study aligns with previous research demonstrating the link between addictive behaviors and aggression. For example, Jeong et al. (2018) found that internet gaming disorder is associated with increased aggression, particularly in adolescents (Jeong et al., 2018). The current study extends these findings by showing that this relationship holds true in a clinical population with anxiety disorders, suggesting that internet addiction may serve as a catalyst for aggression in vulnerable individuals.

The mediating role of internet addiction in the relationship between self-control and aggression highlights the importance of addressing addictive behaviors in therapeutic settings, particularly for individuals with anxiety disorders. This finding suggests that interventions aimed at reducing internet addiction could have a dual benefit by also reducing aggressive behaviors, particularly in individuals with low self-control. This is consistent with the findings of Faretta and Farra (2019), who reported that interventions targeting addictive behaviors can lead to significant reductions in aggression and anxiety (Faretta & Farra, 2019).

Despite the significant findings, this study has several limitations that must be acknowledged. First, the cross-sectional design of the study limits the ability to draw causal inferences. While the results suggest a mediating role of internet addiction in the relationship between self-control and aggression, the directionality of these relationships cannot be definitively established. Longitudinal studies are needed to confirm these findings and to explore the temporal

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dynamics between self-control, internet addiction, and aggression.

Second, the study relied on self-report questionnaires, which may be subject to social desirability bias and other forms of response bias. Participants may have underreported their levels of aggression or internet addiction due to social desirability concerns, which could potentially affect the accuracy of the findings. Future studies could benefit from incorporating multi-method approaches, including behavioral assessments and clinical interviews, to obtain a more comprehensive understanding of these variables.

Third, the sample was drawn from individuals diagnosed with anxiety disorders in Tehran, which may limit the generalizability of the findings to other populations or cultural contexts. Cultural factors can significantly influence the expression of aggression, self-control, and internet addiction, and future research should explore these relationships in diverse cultural settings to determine the extent to which the findings of this study are applicable to other populations.

Future research should address the limitations of the current study by employing longitudinal designs to explore the causal relationships between self-control, internet addiction, and aggression. Longitudinal studies would allow researchers to examine how these variables interact over time and whether changes in self-control lead to subsequent changes in internet addiction and aggression, or vice versa. This would provide a clearer understanding of the temporal dynamics between these variables and could inform the development of more targeted interventions.

Additionally, future research should consider the role of other psychological variables that may interact with self-control, internet addiction, and aggression. For instance, variables such as emotion regulation, impulsivity, and social support could potentially moderate or mediate these relationships. Exploring these additional variables could provide a more nuanced understanding of the factors that contribute to aggression in individuals with anxiety disorders and could inform the development of more comprehensive intervention strategies.

Moreover, future research should explore these relationships in more diverse populations and cultural contexts. As noted, cultural factors can significantly influence the expression of psychological constructs, and it is important to determine whether the findings of this study are consistent across different cultural settings. Cross-cultural research could also explore how cultural norms and values influence the development and expression of self-control, internet addiction, and aggression, providing valuable insights into the generalizability of the study's findings.

The findings of this study have important implications for clinical practice, particularly in the treatment of individuals with anxiety disorders who also exhibit aggressive behaviors and internet addiction. Given the significant mediating role of internet addiction in the relationship between self-control and aggression, interventions aimed at reducing internet addiction should be a priority in therapeutic settings. Clinicians could incorporate strategies for managing and reducing internet use as part of a comprehensive treatment plan for anxiety disorders, particularly for individuals with low self-control.

Additionally, interventions aimed at enhancing self-control could be particularly effective in reducing both aggression and internet addiction in individuals with anxiety disorders. Techniques such as cognitive-behavioral therapy (CBT), mindfulness-based interventions, and self-regulation training could be incorporated into treatment programs to help individuals develop better self-control skills. These interventions could be tailored to address the specific needs of individuals with anxiety disorders, focusing on the development of coping strategies that reduce the reliance on the internet as a maladaptive coping mechanism.

Furthermore, the findings suggest that a holistic approach to treatment that addresses both anxiety symptoms and associated behaviors such as aggression and internet addiction may be more effective than treatments that focus solely on anxiety. Clinicians should consider integrating treatment approaches that address the broader psychological and behavioral patterns associated with anxiety disorders, including the management of aggression and internet addiction. This could involve a combination of individual therapy, group therapy, and psychoeducation, aimed at helping individuals develop healthier coping strategies and improve their overall psychological well-being.

In conclusion, the current study provides valuable insights into the complex relationships between self-control, internet addiction, and aggression in individuals with anxiety disorders. The findings underscore the importance of addressing internet addiction as a key factor in managing aggression and suggest that enhancing self-control could be an effective strategy for reducing both internet addiction and aggression in this population. By addressing these issues in clinical practice, clinicians can improve treatment outcomes for individuals with anxiety disorders and help them achieve better overall mental health.

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Authors' Contributions

In this article, the corresponding author was responsible for the intervention implementation, data analysis, and manuscript writing, while the other authors supervised the data analysis and manuscript writing.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

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