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Examining the relationship between internet gaming disorder, and internet addiction, psychological inflexibility and hopelessness in university students

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Abstract

The current study aims to investigate the relationship between internet gaming disorder, internet addiction, psychological inflexibility, and hopelessness among university students. We employed a correlational survey model in the study. As data collection tools, the Internet Gaming Disorder Scale Short Form, Young Internet Addiction Test Short Form, Acceptance and Action Questionnaire-2, Beck Hopelessness Scale, and Personal Information Form were used. We conducted an unpaired t-test, one-way analysis of variance (ANOVA), Pearson product-moment correlation coefficient analysis, and multiple linear regression analysis. University students' level of internet gaming disorder differs significantly according to gender, time of playing games during the week and the weekend, type of device preferred to play games, and type of the preferred game. The study findings also showed that internet gaming disorder was significantly related to internet addiction, psychological inflexibility, and hopelessness in the positive direction. There were also significant positive relations between internet addiction and psychological inflexibility, as well as hopelessness, and between psychological inflexibility and hopelessness. Lastly, internet addiction, psychological inflexibility, and hopelessness had a predictive effect on internet gaming disorder.

Keywords: internet, internet gaming disorder, internet addiction, psychological inflexibility, hopelessness, university students, hope, young adult

Main points

- There is a positive relationship between internet gaming disorder and internet addiction at a statistically significant level.
- There is a positive relationship between internet gaming disorder and psychological inflexibility at a statistically significant level.
- There is a positive relationship between internet gaming disorder and hopelessness at a statistically significant level.
- Internet addiction, psychological inflexibility and hopelessness predict internet gaming disorder at a statistically significant level.

Introduction

In recent years, many changes have occurred in daily life and leisure time activities with the development of technology and the internet. However, the changes brought by the internet might lead to negative consequences such as internet gaming disorder. Internet gaming disorder (IGD) is described as a state lasting at least 12 months in which people affected by this disorder give more priority to games; games take precedence over other hobbies and daily activities; behavioral patterns cause significant breakdowns in personal, familial, social, educational, and professional life; and gaming continues or increases even more despite the negative consequences (World Health Organization, 2020). In this regard, it is possible to state that playing games too much has negative effects on people's lives physically, psychologically, and socially, resulting in negative consequences. These negativities include psychosocial problems such as antisocial

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behaviors, problems with anger management (Wartberg et al., 2017), loneliness (André et al., 2020; Batmaz & Çelik, 2021), depression, stress, anxiety, and physical problems such as fatigue, insomnia, and concentration problems (Männikkö et al., 2015). There are some risk factors for IGD such as being male, depression, impulsivity, weekly gaming time, loneliness (Ropovik et al., 2023), stressful life events, social support, rumination, personality traits, maladaptive cognitions (Ji et al., 2022), fearful attachment style (Yılmaz & Özkan, 2022), internet addiction (Traş, 2019), age, and type of games (Şendurur & Şendurur, 2018).

It is stated that the rate of gaming addiction decreases especially as the age of individuals increases (André et al., 2020). Considering other studies in the literature which show that being male and being at a young age can cause IGD (Bonnaire & Baptista, 2019; Torez, 2019; Wittek et al., 2016; Zhang et al., 2019), it can be said that young adults, university students, and men are in the risk group in terms of IGD. The fact that playing internet games is a relatively new phenomenon and does not attract the interest of older generations is considered an explanation for this situation (Wittek et al., 2016). The emergence of sports branches based on online games such as e-sports, which are generally pursued by young adults due to developing technology (Martončik, 2015; Mustafaoğlu, 2018), and the fact that most of the people who earn income from platforms such as YouTube and Twitch as a job that requires playing games for more than 20 hours a week are young adults (Johnson, 2021) support the idea that internet games are more attractive leisure activities for young individuals.

Internet addiction is defined by certain criteria such as an individual's excessive preoccupation with the internet to escape from problems such as hopelessness, anxiety, and depression, and as a result, missing the opportunity for education, a job, or a relationship, repetitively failing attempts to control internet use, and experiencing negative emotional states in this process (Young, 1998). The literature review shows that internet addiction leads to quite many psychological disorders such as impulsivity, depression (Devine et al., 2022), bullying and cyberbullying (Zsila et al., 2018), a high level of anxiety (Stavropoulos et al., 2017), stress and loneliness (Ostovar et al., 2016), and a low level of life satisfaction (Traş et al., 2020).

Psychological flexibility, the skill of being conscious, being open-minded to life experiences, and being able to take action in a value-driven manner, is grounded on six fundamentals of dissociation, acceptance, contact with the moment, contextual self, values and value-driven behaviors, which increase life quality (Hayes et al., 2006). Additionally, psychological inflexibility, which can be briefly defined as the lack of psychological flexibility (Kashdan & Rottenberg, 2010), occurs when a person tries to escape from undesirable inner life experiences, reduces their contact with the moment and the possibility of taking value-driven actions, and makes a dysfunctional effort to control their feelings, thoughts, and behaviors in order to escape from this experience (Bond et al., 2011). Psychological inflexibility leads to emotional burnout in individuals (Toprak et al., 2020), decreases well-being (Avsec et al., 2022), creates problems with emotion regulation (Lilly & Allen, 2015), and causes problems such as stress, anxiety, and depression (Yao et al., 2023).

Another variable thought to be related to IGD is hopelessness. Hopelessness is described as one's having negative expectations about thier individual life goals and future plans (Melges & Bowlby, 1969). Chronic hopelessness is a variable that can affect individuals' social skills and psychological well-being and causes people who feel desperate, pessimistic, and hopeless to develop pathological cases about their lives, which is a threat to their well-being (Beck et al., 1985). It is seen that hopeless individuals who do not strive to develop useful strategies to cope with negative situations and do not have any goals (Huen et al., 2015) are self-critical (Gong et al., 2019) and have difficulties in interpersonal relationships (Savaşan et al., 2013). It has been found that hopelessness, which can develop with low levels of social support and meaning in life (Zuo et al., 2020), is associated with variables such as cyberbullying (Dilmaç, 2017), stressful experiences (Parada-Fernández et al., 2021), depression, and suicidal ideation (Keshoofy et al., 2023).

The literature review shows that there are significant positive relationships between internet addiction and video gaming addiction (Günüç, 2015), hopelessness and internet addiction (Şimşek et al., 2015), and internet gaming addiction and psychological inflexibility (İnce, 2020). Therefore, it is thought that psychological inflexibility, internet addiction, and hopelessness might have a predictive effect on internet gaming disorder. In the light of the current body of knowledge in related literature, this study aims at investigating the predictive relationship between internet gaming disorder and psychological inflexibility, internet addiction, and hopelessness among university students.

Method

Research Model

In the current study, we employed a correlational survey model, which is a general survey model that aims to identify the relationship between two or more variables (Büyüköztürk et al., 2016). Internet gaming disorder is the dependent variable of the study, and the independent variables are psychological inflexibility, internet addiction, and hopelessness.

Study Group

The study group was composed of 642 university students, 464 (72.3%) of whom were female and 178 (27.7%) of whom were, male with an average age of 21 (Table 1). The study group of the research was determined by the convenience sampling method. The convenience sampling method involves collecting data starting from the most accessible participants in order to save time, money, and labor (Büyüköztürk et al., 2016).

Table 1. Information about the demographic variables

Personal Information	Groups	n	%
Gender	Female	464	72.3
	Male	178	27.7
Game Playing Time during the Week	None	371	57.8
	Less than an hour	124	19.3
	1-3 hours	105	16.4
	More than 3 hours	42	6.5
Game Playing Time at the Weekend	None	355	55.3
	Less than an hour	116	18.1
	1-3 hours	106	16.5
	More than 3 hours	65	10.1
Type of the Device Preferred to Play Games	Not playing games	329	51.2
	Desktop	50	7.8
	Laptop	86	13.4
	Game console	11	1.7
	Smartphone/tablet	166	25.9
Type of the Preferred Game	Not playing games	376	58.6
	Battle Royale	69	10.7
	FPS	78	12.1
	MMORPG	18	2.8
	MOBA	41	6.4
	Playing other games	60	9.3

Data Collection Tools

Internet Gaming Disorder Scale-Short Form (IGDS-SF)

The scale was developed by Pontes and Griffiths (2015), and adopted into Turkish culture by Arıcak et al. (2018). It is composed of nine items and one factor. The items are scored on a 5-point Likert-type scale. The scale has no reverse item, and the total score to be received from the scale varies between 9 and 45. Scoring all the items "Often" will result in a total score of 36, so this score is stated to be considered as the cut-off score for IGD. Cronbach alpha internal consistency coefficient was found to be .82 for the whole scale. In this study, we calculated the Cronbach alpha coefficient to be .85.

Young Internet Addiction Test-Short Form (YIAT-SF)

The scale was developed by Young (1998), transformed into a short form by Pawlikowski et al. (2013), and adapted into Turkish culture by Kutlu et al. (2016). It is a 5-point Likert-type scale with one factor and 12 items. The scale has no reverse item. A high score refers to a high level of internet addiction. Cronbach alpha coefficient was found to be .91 for university students. In this study, we calculated the Cronbach alpha coefficient to be .88.

Acceptance and Action Form-2

The scale was developed by Bond et al. (2011), and adopted into Turkish culture by Yavuz et al. (2016). It is a 7-point Likert-type scale with seven items. The scale has no reverse item. A high score refers to a high level of psychological inflexibility. Cronbach alpha coefficient was found to be .84. In this study, we calculated the Cronbach alpha coefficient to be .90.

Beck Hopelessness Scale

The scale was developed by Beck et al. (1974), and adopted into Turkish culture by Seber et al. (1993). It is composed of 20 items, 11 of which are true-keyed items and nine of which are false-keyed items. The total score can vary between 0 and 20. Cronbach alpha coefficient was found to be .86. In this study, we calculated the Cronbach alpha coefficient to be .89.

Personal Information Form

The personal information form was developed by the researchers to gather general information about the participants.

Data Collection

We collected the study data by going into classrooms at a university in Türkiye. We conducted the data collection process on a voluntary basis. We distributed the data collection tools as hard copies to the participants after they signed the consent form. It took the participants 15-20 minutes to respond to the items in the scales.

The ethics committee approval (Decision no: 2021/212), dated April 16, 2021, was obtained from the Ethics Committee for Social and Human Sciences Scientific Research of Necmettin Erbakan University.

Data Analysis

We analyzed the study data via the SPSS 25.0 package program. We collected data from 712 participants at first. We calculated the Mahalanobis Distance value to find outliers, which were excluded from the data set afterwards. There was no missing data in the data set. Finally, data gathered from 642 participants were included in the analysis. After excluding the outliers from the data set, we examined the coefficients of skewness and kurtosis to see if the participants' scores displayed a normal distribution or not. As seen in Table 2, coefficients of skewness and kurtosis belonging to the Internet Gaming Disorder, Acceptance and Action Form-2, Young Internet Addiction, and Beck Hopelessness scales

Table 2. Descriptive statistics about the variables

Variables	n	$\bar{X}$	Ss	CS	SDCS	CK	SECK
Internet Gaming Disorder	642	12.20	4.403	1.482	.096	1.317	.193
Internet Addiction	642	26.47	8.486	.548	.096	-.057	.193
Psychological Inflexibility	642	23.59	10.42	.346	.096	-.762	.193
Hopelessness	642	5.71	4.965	.873	.096	-.221	.193

CS: Coefficient of Skewness, SDCS: Standard Deviation Coefficient of Skewness, CK: Coefficient of Kurtosis, SECK: Standard Error Coefficient of Kurtosis

are within the interval of ±1.5. Coefficients of skewness and kurtosis being within the interval of ±1.5 means that the study data display a normal distribution (Tabachnick & Fidell, 2013). Therefore, we concluded that the study data displayed a normal distribution in the current study. After the preliminary analysis, we conducted an independent samples t-test to see if there was a significant difference between the two unrelated sample means, and we conducted a one-way analysis of variance (ANOVA) to see if there was a significant difference between more than three unrelated sample means. During the analysis of variance, we used Tamhane's T2 multiple comparison test to identify which group caused the difference between the groups, as the variances did not have a homogeneous distribution. We conducted Pearson product-moment correlation coefficient analysis to test the correlations between the scores gathered from the scales. Lastly, we conducted multiple linear regression analysis to analyze the predictive relationship between the dependent variable and independent variables.

Results

Findings about the Differences in Demographic Variables

As is seen in Table 3, male students had a higher score ($\bar{X}$=15.37) in IGD than female students ($\bar{X}$=10.98) at a statistically significant level (p<.05).

As is seen in Table 4, the participants who stated that they did not play games during the week had a lower level of IGD ($\bar{X}$=10.07) than those who stated that they played games for less than an hour ($\bar{X}$=13.27), between 1-3 hours ($\bar{X}$=16.46), and more than 3 hours ($\bar{X}$=17.26) at a statistically significant level (p<.05). The participants who stated that they played games less than an hour during the week had a lower level of IGD ($\bar{X}$=13.27) than those who stated that they played games for 1-3 hours ($\bar{X}$=16.46), and more than 3 hours ($\bar{X}$=17.26) at a statistically significant level (p<.05). The participants who stated that they did not play games at the weekend had a lower level of IGD ($\bar{X}$=9.90) than those who stated that they played games for less than an hour ($\bar{X}$=12.96), between 1-3 hours ($\bar{X}$=15.65), and more than 3 hours ($\bar{X}$=17.76) at a statistically significant level (p<.05). The participants who stated that they played games for less than an hour at the weekend had a lower level of IGD ($\bar{X}$=12.96) than those who stated that they played games for 1-3 hours ($\bar{X}$=15.65) and more than 3 hours ($\bar{X}$=17.76) at a statistically significant level (p<.05). The participants who stated that they played games for 1-3 hours at the weekend ($\bar{X}$=15.65) had a lower level of IGD than those who stated that they played games for more than 3 hours ($\bar{X}$=17.76) at a statistically significant level (p<.05). The participants who stated that they did not play games had a lower level of IGD ($\bar{X}$=9.64) than those who stated that they preferred a desktop/laptop to play games ($\bar{X}$=16.36) and a smartphone/tablet/game console to play games ($\bar{X}$=13.76) at a statistically significant level (p<.05). The participants who stated that they preferred a smartphone/tablet/game console to play games had a lower level of IGD ($\bar{X}$=13.76) than those who stated that they preferred a desktop/laptop to play games ($\bar{X}$=16.36) at a statistically significant level (p<.05). The participants who stated that they did not play games had a lower level of IGD ($\bar{X}$=10.01) than those who preferred other games (referring to games other than Battle Royale, FPS, MOBA, and MMORPG genres)($\bar{X}$=13.80), Battle Royale games ($\bar{X}$=14.85), FPS games ($\bar{X}$=16.12) and MOBA games/MMORPGs ($\bar{X}$=16.23) at a statistically significant level (p<.05). The participants who stated that they preferred other games had a lower level of IGD ($\bar{X}$=13.80) than those who preferred FPS games ($\bar{X}$=16.12) and MOBA games/MMORPGs ($\bar{X}$=16.23) at a statistically significant level (p<.05).

Findings about the Correlations among the Study Variables

As is seen in Table 5, there was a statistically significant low-level positive relationship between university students' level of IGD and internet addiction (r=.27, p<.01), psychological inflexibility (r=.23, p<.01), and hopelessness (r=.28, p<.01). On the other hand, internet addiction was positively related to psychological inflexibility (r=.46, p<.01) and hopelessness (r=.30, p<.01) at a statistically significant medium level. There was a positive relationship between hopelessness and psychological inflexibility at a statistically significant medium level (r=.53, p<.01).

Findings about Predicting Internet Gaming Disorder

As is seen in Table 6, internet addiction, psychological inflexibility, and hopelessness predicted 12% of IGD in university students (R=.346, R^2=.12, p<.01).

Table 3. Result of t-test as to the differences in the scores of the internet gaming disorder scale according to gender

	Variables	Groups	n	$\bar{X}$	Ss	Sd	t	p	d
IGD	Gender	Female	464	10.98	3.30	640	-10.370	.000**	0.99
		Male	178	15.37	5.26				

p<.05*, p<.001**

Table 4. Results of one-way analysis of variance as to the differences in the university students' mean scores of the internet gaming disorder scale according to different variables

	Variable	Groups	N	$\bar{X}$	Ss	F	p	Df	η2	Difference (Tamhane T2)
IGD	Game Playing Time during the Week	I don't play (1)	371	10.07	2.11	134.469	.000**	3-638	.387	1-2, 1-3,1-4, 2-3, 2-4
		Less than an hour (2)	124	13.27	4.47					
		1-3 hours (3)	105	16.46	4.73					
		More than 3 hours (4)	42	17.26	5.32					
	Game Playing Time at the Weekend	I don't play (1)	355	9.90	1.89	153.440	.000**	3-638	.419	1-2, 1-3,1-4, 2-3, 2-4, 3-4
		Less than an hour (2)	116	12.96	4.29					
		1-3 hours (3)	106	15.65	4.66					
		More than 3 hours (4)	65	17.76	4.89					
	Type of the Device Preferred to Play Games	Not playing games (1)	329	9.64	1.52	211.263	.000**	2-639	.398	1-2, 1-3, 2-3
		Desktop/Laptop (2)	136	16.36	5.36					
		Smartphone/Tablet/ Game console (3)	177	13.76	4.00					
	Type of the Preferred Game	Not playing games (1)	376	10.01	2.25	93.415	.000**	4-637	.370	1-2, 1-3,1-4, 1-5, 3-5, 4-5
		Battle Royale (2)	69	14.85	4.88					
		FPS (3)	78	16.12	4.86					
		MOBA/MMORPG (4)	59	16.23	5.16					
		Other (5)	60	13.80	3.98					

p<.05*, p<.001**

Table 5. Results of pearson product-moment correlation coefficient as to the correlations among university students' level of internet gaming disorder, internet addiction, psychological inflexibility and hopelessness

Variables	Internet Gaming Disorder	Internet Addiction	Psychological Inflexibility	Hopelessness
Internet Gaming Disorder	1	.274**	.238**	.283**
Internet Addiction		1	.463**	.305**
Psychological Inflexibility			1	.533**
Hopelessness				1

p<.05*, p<.001**

Table 6. Results of multiple regression analysis as to predicting internet gaming disorder

Variables	B	Standard Error	β	t	r^2	F	R^2
Fixed	8.119	.558		14.546		28.925	.12
Internet Addiction	.100	.022	.193	4.601	.274		
Psychological Inflexibility	.017	.020	.041	.862	.238		
Hopelessness	.179	.039	.202	4.582	.283		

p<.01**, R=.346

Discussion

In this study, male university students had a higher level of IGD than female students. This result is parallel with the literature, and previous studies which concluded that males could be more sensitive to game-related rewards than females, and males could be more willing to play games than females. This is said to have the potential to lead males to have less control over limiting their gaming activities (Dong & Potenza, 2022). There are also studies in the literature which indicate that the competitive nature of games attracts men more than women (Wartberg et al., 2017). According to the literature, some other reasons might be that men are not supervised by the society as much as women are, and so they do not feel pressure, they have easier access to technological devices, and women do not prefer playing games as they are more sociable than men

(Çelik, 2021). In the light of all these factors, it is possible to explain the reason why men have higher levels of IGD than women by biological tendencies, some other risk factors that are a result of sociocultural attitudes, and the fact that men are more familiar with the dynamics of video games.

The current study reveals that the longer university students played games during the week/at the weekend, the higher the level of IGD was. There are many studies in the literature that support the current study finding (Brailovskaia et al., 2022; Rho et al., 2018; Yu et al., 2022) This might be because individuals continue to play games for the feeling of achieving success through internet games as they develop a tolerance towards playing games. According to a study, as the perceived social support decreased, weekly gaming time increased, which in turn increased internet gaming addiction (Yavuz & Erden Çınar, 2022). Considering online games, it is assumed that individuals have the opportunity to socialize in the chatrooms of online games. Therefore, we believe that individuals spare much time to play games in order to receive social support from people they meet through games. Moreover, we also think that the type of game is also a factor that increases the time people spend playing games. For example, some internet games require players to follow the game for a long time. In this case, it is an expected result that individuals spend more time playing games.

University students' level of IGD showed a statistically significant difference according to the type of device preferred to play games. It was found in a study that playing online computer games affected online game addiction more than mobile games, and that the duration of playing computer games increased men's tendency to be addicted, and the duration of mobile games increased women's tendency to be addicted (Lee & Kim, 2017). In the light of the findings in the literature, we believe that the type of device preferred for playing games is an important variable affecting IGD. It is thought that various factors such as computers having the necessary technical equipment to install games more than smartphones/tablets, the increase in the quality and efficiency of games with features such as widescreen and graphics settings, and easier game control on the computer all lead individuals to prefer computers for playing games.

University students' level of IGD showed a statistically significant difference according to the type of preferred games. Various study findings in the literature reveal that individuals who prefer MMORPG and FPS games have increased playing times and that these individuals exhibit problematic gaming behaviors (Dieris-Hirche et al., 2020), and the most preferred game type is FPS games, but MOBA games have more addictive effects (Orak et al., 2021). According to the results of this study, it is thought that FPS games are realistic in nature, usually deal with war themes, and require speed and coordination, requiring the player to pay attention and focus. Thus, the player is expected to increase the time spent in the game in order to improve himself/herself in the game. As a result, it is assumed that FPS games affect IGD.

According to another finding of the current study, there was a significant relationship between IGD, psychological inflexibility, internet addiction, and hopelessness. Internet addiction, hopelessness, and psychological inflexibility predicted 12% of the total variance in IGD. The value-oriented life levels of role-playing game players were lower than others (Kahraman, 2021). Internet addiction had a predictive effect on individuals' psychological inflexibility (Kabakcı & Traş, 2024). Individuals' inability to use stress coping strategies effectively increased the risk of internet addiction, and this was found to be associated with low levels of cognitive dissociation, experiential avoidance, and psychological inflexibility. Based on this result, it was emphasized that individuals may overuse the internet to get away from stressful events and situations (Chou et al., 2018). Furthermore, it was found in another study that depressive symptoms and hopelessness had a mediating role in the relationship between attention deficit and hyperactivity disorder, and IGD (Chen et al., 2021). In a study, it was found that the most prominent purpose for using the internet that predicted problematic internet use was to establish social relationships with people the users did not know (Ceyhan, 2010). In the light of all this information, it can be stated that individuals prefer to use the internet and play games as an alternative way to combat the difficulties they face in their lives and to receive the social support they need. It is thought that this attempt of individuals who try to overcome the difficulties they experience with these behaviors results in having more negative and repetitive thoughts and expectations about the future, which creates a psychological inflexibility by narrowing their behavioral patterns and preventing them from exhibiting value-oriented behaviors. Therefore, internet addiction, psychological inflexibility and hopelessness are thought to be the factors that affect IGD.

Limitations and Suggestions

Limitations of this study include the limited sample size and geographical area, and that it is a correlational study and a self-report assessment. In addition, the fact that the number of female participants is almost three times the number of male participants and that the preferred game genres are limited to the determined categories constitute a limitation for the research. With the development of technology and changes in the gaming industry, games address more masses and a wide range of age groups today. Researchers can carry out studies with larger and various groups. Future studies can focus on participants who have been diagnosed clinically or who only play games. It would also be beneficial to conduct experimental and qualitative studies.

Factors regarding the dynamics of games, time spent on playing games, type of game, and the device used for playing games have an effect on IGD. Psychoeducational training, individual and group psychological counselling, and guidance plans about time management can be conducted in order to help individuals decrease the time they spend playing games and to inform university students about IGD and various dynamics about gaming. Also, it is recommended that psychological counselling and guidance centers and units at universities should be activated so that they can take steps for

IGD. Further research can be conducted focusing on variables such as with whom university students live, whether they stay with their families or far away from them as a university student, whether they have an internet connection at home, their academic success, and different demographic variables such as in-game purchases, healthy life skills, and making friends while playing games.

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Author contributions

Conception and design: E.N.İ., Z.T.; Data acquisition: E.N.İ., Z.T.; Data interpretation: E.N.İ., Z.T.; Drafting of the manuscript: E.N.İ., Z.T.; Critical revision of the manuscript: E.N.İ., Z.T. All authors reviewed the results, approved the final version of the manuscript, and agreed to be accountable for all aspects of this study.

Ethical approval

This study was approved by the Necmettin Erbakan Üniversitesi Sosyal ve Beşeri Bilimler Bilimsel Araştırmalar Etik Kurulu (Date: April 16, 2021, Decision/Protocol No: 2021/212). Informed consent was obtained from all participants involved in this study.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of interest

The authors declare that this study 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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Generative AI statement

The authors declare that no generative AI or AI-assisted technologies were used in the writing or preparation of this study.

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