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Research Article

The Effect of Mind and Intelligence Games on University Students' Perceived Stress and Psychological Well-Being Level

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Abstract

This study aims to examine whether mind and intelligence games that support cognitive, social, and emotional skills have an effect on university students' perceived stress and psychological well-being levels. The population of the study consists of students actively studying at Kastamonu University Tosya Vocational School in the 2021-2022 academic year. Two groups of students were included in the study. While one of the groups had mind and intelligence game activities, the other group did not have these activities. The obtained data were analyzed using the statistical package program. As a result of the analysis, it was concluded that the psychological well-being levels of those who participated in the mind and intelligence game workshops were significantly higher in the positive direction and the perceived stress level was significantly lower in the negative direction compared to those who did not participate. According to the results of the research, it can be said that mind and intelligence games are an important educational tool used to support the psychosocial development of students and individuals and reduce stress.

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Introduction

The individuals may encounter various problems throughout their lives, and these negative experiences may lead to negative reactions such as depression, anxiety, and stress. On the other hand, there may be limited time that the individual can allocate to solve the problems. Therefore, instead of wasting time by focusing on the problem, the individual can focus on the solution and produce solutions in line with his/her goals. The individual must have solution-oriented thinking to realize this. Mind and intelligence games involve games and activities that require individuals to realize their mental potential, make correct and quick decisions, and produce individual solutions to problems. Mind and intelligence games can positively affect the well-being of the individual, especially psychological well-being, and reduce stress levels.

The concept of psychological well-being emphasizes that the human being is a whole as a multidimensional structure and a lifestyle carrying its responsibility to protect, maintain and improve its well-being within this whole (Ryff & Keyes, 1995; Ryff & Singer, 2008). Stress is the physical, emotional, and behavioural reactions to the changes experienced by individuals. Stress has a negative effect on university students. The new surroundings, friends and material and moral problems experienced by students who start a new life with a university education cause stress. The stress arising in this situation negatively affects students' learning processes and reduces their success (Humphrey & McCarthy, 1998).

In the studies, it is stated that mind and intelligence games are tools that motivate individuals internally with features such as questioning, emotional attachment, competition, questioning, uncertainty, ambition, not giving up, motivation, empathy, enjoyment and stress control (Devecioğlu & Karadağ, 2014). Considering the studies conducted with the same sample group on their psychological well-being and stress levels; It has been observed that there is a positive relationship between solution-oriented thinking and psychological well-being and a negative relationship between stress levels (Karahan, 2016). In this context, this study aims to determine whether mind and intelligence games that support cognitive, social, and emotional skills have an effect on university students' psychological well-being and perceived stress levels.

Mind and Intelligence Games

Mind and intelligence are the most fundamental characteristics that distinguish human beings from all other living beings. Although the concepts of mind and intelligence are often used instead of each other, they have different meanings. Intelligence is the ability to make sense of beliefs, information, and intentions by observing the behaviour of others (Navarro, Goring & Condway, 2021). Mind is the set of competencies responsible for all mental phenomena. These competencies include sensation, will, memory, thought, and imagination. The mind stands for the power to think, understand and comprehend. In the study of the human mind, reason refers to the human mind's ability to reach correct conclusions about what is right and what is wrong (Colman, 2008). Intelligence, on the other hand, represents the ability of people to perceive, interpret and conclude information (Özel & Akça, 2022). Intelligence is the ability to learn mentally, benefit from what has been learned, adapt to changing conditions, and produce different solutions (Yörükoğlu, 2004).

The importance of mind and intelligence games in enabling people to make quick and correct decisions, to produce solutions to problems, and to realize their potential. Mind and intelligence games improve the cognitive functions of individuals by exercising the brain (Ott & Pozzi, 2012). Mind and intelligence games are one of the applications that develop imagination, memory, combination, logic and strategic judgments, relaxation, and development, original and constructive, and innovative thinking (Kula, 2020). Mind and intelligence games, contributing positively to people's cognitive and psychosocial development, are divided into six groups: "intelligence questions", "memory games", "geometric and mechanical games", "strategy games", "verbal games" and "reasoning and processing games" (Ministry of National Education [MoNE], 2018).

Stress

The Latin term stress, which is one of the most basic health problems of individuals, encountered at every stage of life, was used in the 17th century to mean distress, difficulty, or suffering (Oxford Dictionary, 1933). Although the concept of stress is a commonly used term today, it is often used interchangeably with various other terms such as stress, anxiety, pressure, and tension. Therefore, stress is a broad concept with different meanings. Stress can be broadly defined as an organism's response to an emergency, in response to a perceived or real stressor, in response to homeostasis (Daviu, Bruchas, Moghaddam, Sandi & Beyeler, 2019). During this situation, the organism initiates an integrated reaction that includes physiological and behavioral responses (Daviu et al., 2019). Stress can cause various alcohol, and tobacco use, etc. behavior, burnout, family problems, sleep disorders, etc. psychological and heart disease, back pain, peptic ulcer disease, headache, diabetes, etc. medical disorders in individuals (Akça & Özel, 2022). As seen stress causes behavioural disorders and psychological disorders in individuals and seriously affects human health. The best solution to avoid the negative consequences of stress is to manage stress effectively (Özel & Karabulut, 2018).

Psychological Well-Being

The concept of well-being is a complex and multifactorial structure. Well-being is divided into psychological well-being, which examines the psychological, social, and spiritual aspects of individuals, and subjective well-being, which is based on cognitive and emotional judgments made by individuals about their lives (Schulte, et al., 2015). Psychological well-being is expressed as the level of psychological happiness and health,

which includes positive emotions such as life satisfaction and success (Berger & Tobar, 2007). Well-being is achieved by reaching a state of balance that is influenced by both motivating and challenging life events (Dodge, Daly, Huyton, & Sanders, 2012).

Psychological well-being is a multidimensional structure that emphasizes a lifestyle that carries its responsibility to develop, maintain and protect the well-being of the individual as a whole (Ryff & Keyes, 1995). The "Six Factor Model of Psychological Well-being" was developed by Carol Ryff, which contributes to the individual's psychological well-being, satisfaction, and happiness (Ryff & Singer, 2008). The Model consists of six factors:

- Autonomy: The individual is independent and regulates their behaviour independently of social pressures.
- Environmental Mastery: The individual uses opportunities effectively and has a sense of mastery in managing environmental factors and activities, including managing daily tasks and creating situations that benefit personal needs.
- Personal Growth: The individual continues to develop, is open to new experiences, and recognises improved behaviour and self over time.
- Positive Relationships with Others: The individual engages in meaningful relationships with others that involve mutual empathy, closeness and compassion.
- Purpose in Life: Refers to the individual's strong goal orientation and belief that life has meaning.
- Self-acceptance: The individual's positive attitude about themself (Ryff, 1989).

The Relationship between Mind and Intelligence Games, Perceived Stress and Psychological Well-Being

When the studies on mind and intelligence games in the literature are examined, it was reported in a study conducted by Demirel (2015) that mind and intelligence games activity had positive effects on individuals' problem-solving skills and academic achievement. As a result of a study by Baki (2018), it was stated that mind and intelligence games affect academic self-efficacy and problem-solving skills. As a result of the research conducted by Marangoz and Demirtaş (2017) using mechanical intelligence games, it is seen that the games contribute to strategic thinking, the concentration of attention, establishing the part-whole relationship, analysis, visual perception, and clue utilisation skills among cognitive skills scientists investigating the effects of games have found that games can

change negative moods, increase certain visuospatial skills, and provide healthy social interactions (Kowal et al., 2021). Studies have emphasized that solution-oriented thinking has a positive relationship with psychological well-being (Yavuz & Yavuz, 2018) and a negative relationship with stress level (Karahan, 2016). Based on the researches in the literature, it is thought that while mind and intelligence games affect stress negatively, they will affect psychological well-being positively. The research hypotheses formed in this direction are as follows.

Hypothesis 1: Mind and intelligence games negatively affect perceived stress.

Hypothesis 2: Mind and intelligence games positively affect psychological well-being.

Method

In this section of the study, information about the purpose and model of the research, population and sample, data collection tool, and process are given.

Purpose and Model of the Research

This study aims to examine whether mind and intelligence games that support cognitive, social and emotional skills have an effect on university students' perceived stress and psychological well-being levels. The research model created in this context is shown in Figure 1 below.

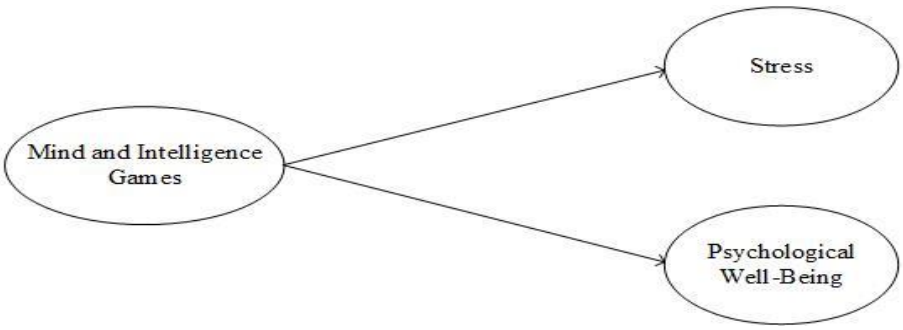

Figure 1. Model of the research

Population and Sample of the Study

The population of the study consists of students actively studying at Kastamonu University in the 2021-2022 academic year. Two groups, experimental and control, were included in this study, which was conducted to examine the effects of mind and intelligence games on university students' perceived stress and psychological well-being levels. One of the groups was included in the mind and intelligence game activities, the other group was not included in these activities. In the study, pre-test and post-test perceived stress and psychological well-being inventory were applied to both groups. The study was carried out

with a minimum of 20 individuals in each group and a total of a minimum of 40 students as a result of a minimum of 95% power and a maximum of 5% type 1 error with G-power analysis.

The mean age of the participants was 20.18 ± 1.03. All of the participants stated that they liked playing games and played computer or physical games. When the participants were asked whether playing games reduce stress, 70% of the experimental group and 80% of the control group stated that it reduces stress. While 45% of the participants in the experimental group stated that they play games every day between 30 minutes and 1 hour and 5% between 1.5 hours and 2 hours, 35% of the participants in the control group stated that they spend less than 30 minutes and 10% between 1.5 hours and 2 hours every day.

Data Collection Tool

In the study, "questionnaire" with standardised questions was preferred as a data collection tool. In the first section of the questionnaire form, there are questions about demographic characteristics, while in the other sections; there are questions about perceived stress and psychological well-being. "Psychological Well-Being" scale developed by Diener, Scollon and Lucas (2009) and adapted into Turkish by Telef (2013) was used to measure the psychological well-being levels of the students. The Cronbach's Alpha Coefficient for the scale was determined as, .87. In this study The Cronbach's Alpha Coefficient for the scale was determined as, .791. To measure the perceived stress levels of the students, the "Perceived Stress" scale was developed by Cohen, Kamarck and Mermelstein (1983) and adapted into Turkish by Eskin et al. (2013). The Cronbach's Alpha Coefficient for the scale was determined as, .84. In this study The Cronbach's Alpha Coefficient for the scale was determined as, .785.

Data Collection Process

The data collection process was carried out in 2 stages. After the necessary intelligence games were provided in the first stage, which was the application stage, it was explained to the students that the tests were part of scientific research and their consent was obtained. "Perceived Stress" and "Psychological Well-Being" scales were applied to the students who were accepted to the study as a pre-test. The "Mind and Intelligence Games Workshop Programme", which was planned for 8 weeks in a way that 2 games would be played 2 hours a week for 2 hours each, was applied to the experimental group considering the academic calendar of the university (start of the courses, exam week, etc.), and No

intervention was made in the control group. The following Table 1 shows the Mind and Intelligence Games Workshop Programme.

Table 1. Mind and Intelligence Games Workshop Programme

Week	Game Name	Game Type
1	Sudoku	Reasoning and Operation Game
	Abbalone	Strategy Game
2	Scrabble	Reasoning and Operation Game
	Finding a difference	Memory games
3	Q-Bitz	Geometric and Mechanical Games
	Corridor	Reasoning and Operation Game
4	Intelligence question 1	Intelligence games
	Reversi	Strategy Game
5	Look Look	Memory Games
	Scrabble	Reasoning and Operation Game
6	Mangala	Strategy Games
	Kakuro	Reasoning and Operation Game
7	Intelligence question 2	Intelligence games
	Skippity	Strategy Game
8	Ninestone	Strategy Game
	Tangram	Geometric and Mechanical Games

As can be seen in Table 1, the distribution of 20 mind and intelligence games in total; 5 reasoning and operation games, 2 geometric and mechanical games, 2 memory games, 5 strategy games, and 3 intelligence questions. While determining the intelligence games used in the research, the researches in the related field and the teaching materials of the MONE mind and intelligence games were used. Care was taken to ensure that the mind and intelligence games such as mangala and reversi were suitable for the age group of the students.

In the second stage, which is the Termination Stage, after the completion of the Mind and Intelligence Games Workshop Programme, "Perceived Stress" and "Psychological Well-Being" scales were applied to the experimental and control groups as a post-test, and the data collection process was terminated with this stage.

Findings

Correlation analysis was used to determine the relationships between mind and intelligence games, which are the independent variables of the research, and psychological well-being and perceived stress, which are the dependent variables of our research**.** The relationship levels between the variables are shown in Table 2. below.

Table 2. Examination of the relationship between the pre-test and post-test scores of the scales (n=40)

		Perceived Stress Scale Pre-Test	Psychological Well-Being Scale Post-Test	Psychological Well-Being Scale Pre-Test
Perceived Stress Scale Post-Test	r	0,01		
	p	0,95		
Psychological Well-Being Scale Pre-Test	r	-0,165	0,338	
	p	0,308	**0,033**	
Psychological Well-Being Scale Post-Test	r	-0,003	-0,066	0,541
	p	0,986	0,686	**<0,001**

Spearman's rho Correlation Coefficient

Table 2 shows the analyses of the relationship between the pre-test and post-test scores of the scales. A statistically positive weak relationship was obtained between the mean pre-test score of the psychological well-being scale and the post-test score of the perceived stress scale (r=0,338; p=.033). A statistically positive high correlation was obtained between the psychological well-being scale pre-test score and post-test score (r=0,541; p<.001). No statistically significant relationship was found between the other scores (p>.05).

Table 3. Comparison of pre-test and post-test scores of the scales between and within groups

	Group				Test Sta.	p
	Experimental		Control			
	Mean ± sd	Median (min -max)	Mean ± sd	Median (min max)		
Perceived Stress Scale Pre-Test	48,25 ± 4,56	48 (42 - 61)	47,60 ± 3,45	48 (42 - 55)	t= 0,508	0,615
Perceived Stress Scale Post-Test	36,30 ± 5,39	37 (24 - 49)	45,70 ± 4,46	45 (38 - 56)	t= -6,007	**<0,001**
Test Sta.	t= 9,183		t= 1,297			
p	**<0,001**		0,21			
Psychological Well-Being Scale Pre-Test	40,80 ± 6,70	39,50 (30 - 50)	42,25 ± 6,47	44 (33 - 55)	t= 0,696	0,491
Psychological Well-Being Scale Post-Test	46,05 ± 6,28	45 (35 - 56)	42,15 ± 5,22	43 (30 - 51)	t= 2,134	**0,039**
Test Sta.	t = -3,519		t= 0,102			
p	**0,002**		0,92			

t: Independent Samples t Test; Mean ± standard deviation; Median (minimum - maximum)

Table 3 shows the comparison of the pre-test and post-test scores of the scales between and within the groups. There was no statistically significant difference between the pre-test mean values of the perceived stress scale according to the groups (p=0,615). A statistically significant difference was found between the post-test mean scores of the perceived stress scale for the groups (p<0,001). While the scale score of the experimental group was 36,30 ± 5,39, this value was 45,70 ± 4,46 in the control group. There was no statistically significant difference between the pre-test mean scores of psychological well-

being according to the groups (p=0,491). A statistically significant difference was found between the posttest mean scores of psychological well-being according to the groups (p=0,039). In the experimental group, the post-test scale mean score was 46.05 ± 6.28, while this value was 42.15 ± 5.22 in the control group.

Discussion and Conclusion

The study aims to examine whether mind and intelligence games that support cognitive, social, and emotional skills have an effect on university students' perceived stress and psychological well-being levels. The reason why young people were chosen as the sample is that this age group enjoys playing mobile games. A total of 40 people between the ages of 18-22 years, 20 experimental and 20 control, participated in the study. The experimental group played reasoning, process, strategy, memory, geometric, and mechanical game types for 8 weeks, 2 days a week for 2 hours each, by an expert research team. The control group did not receive any intervention. The tested measurements were made before and after the application to both groups. Accordingly, it was concluded that the psychological well-being levels of those who participated in the mind and intelligence game workshops were significantly higher in the positive direction and the perceived stress level was significantly lower in the negative direction compared to those who did not participate.

When the results of the research hypotheses are examined;

It can be said that mind and intelligence games have a positive effect psychological well-being levels. The result supports the research hypothesis. Game-based interventions have been successfully applied in the field of mental health. In the literature, game scientists have found that games can change negative moods, increase certain visuospatial skills, and provide healthy social interactions (Kowal et al., 2021; Yavuz & Yavuz, 2018). It was observed that the results obtained were similar to our current research. Individuals with high levels of psychological well-being are aware of their own abilities, can struggle with the stresses that occur in their lives, and can contribute to society in line with their abilities.

According to the results of the analyses obtained from the tests applied it can be said that mind and intelligence games have a negative effect on perceived stress levels. The result supports the research hypothesis. Entertainment environments where games are played show potential for stress relief and positive recovery outcomes by increasing stress management skills (Collins & Cox, 2014). Stressed people, defined in the context of managing emergencies, often rely on different reasoning models to conclude non-stressed

people who rely on in-depth analysis of the situation. Mind and intelligence games are often categorized according to their application context or game type. In the present study, "Sudoku, Scrabble, Corridor, Kakuro" games that increase reasoning and processing skills were preferred. The results of our study show that mind and intelligence games have positive effects on stress management skills. There are no studies in the national literature in which stress management skills were tested using these games. Therefore, it is expected that the study will contribute to the national literature by eliminating the deficiency in the field.

In the study, it was concluded that the psychological well-being and stress management skills of the students in the intervention group included in the mind and intelligence games workshops increased in a positive linear direction. Stress is a situation that affects the individual in many ways. However, the way it is managed may vary individually. For this reason, for the result of our research to be generalizable, it is thought that it is important to conduct a re-experimental study of stress management and each type of game individually.

Ethical Committee Permission Information

Name of the board that carries out ethical assessment: Kastamonu University Social and Humanities Scientific Research and Publication Ethics Board

The date and number of the ethical assessment decision: 02.02.2022 -2/12

Author Contribution Statement

Coşkun AKÇA: *Conceptualization, literature review, methodology, implementation, data analysis, translation, and writing.*

Yasemin ÖZEL: *Conceptualization, literature review, methodology, data analysis, translation, and writing.*

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