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THE IMPACT OF DIGITAL GAMES IN HEALTH MANAGEMENT

Evren ÇAĞLARER*

1 Kırklareli University, Technology Faculty, 39100, Kırklareli, Turkey, evren@klu.edu.tr

** Correspondence: evren@klu.edu.tr*

Abstract: In the last period, digitization has also penetrated the medical field, thus game applications on mobile devices help to improve memory but also to slow down some neurodegenerative diseases. This case study aims to determine the behavior of adults as well as the compatibility of Smartphone game applications that have been developed for medical purposes. To carry out this study, a Turkish language questionnaire was applied to determine the interest of people over 50 years old in mobile applications and games. The questionnaire was applied online through social and personal networks e-mail, WhatsApp, Face book and Instagram. The number of questionnaires considered in the study was 310 respondents. The questionnaire was structure in two parts, in the first part was possible to identify the interest of the respondents for digital games and their demographic information. The second part identifies the types of games respondents chose, motives and why they chose specific games. The data base was investigated to determine the contributions of these games on issues such as focusing, processing skills, and their effects on adults' memory using computers and digital games. Respondents' motivations and expectations regarding games provided a detailed insight into the benefits and support for using them to improve memory.

Keywords: digital games, healthcare management, medical support, management change

1 INTRODUCTION

The elderly population continues to increase rapidly in Turkey and in the world. Today, there are 44 million dementia patients all over the world, increasing in proportion to the elderly population.

According to the data of the Turkish Statistical Institute, it is estimated that the proportion of the elderly population over the age of 65 will exceed 10% in 2023 and the frequency of dementia diseases will continue to increase rapidly at the same rate (https://data.tuik.gov.tr).

In 2021, 6 million 112 thousand 760 out of a total of 25 million 329 thousand 833 households in Turkey had at least one person aged 65 and over, defined as the elderly population, in other words, 24.1% of households had at least one elderly person (Anderson, 2016).

If this increasing trend continues, the number of patients is expected to increase to 135 million worldwide in 2050 (Gervasio et al, 2022). Current treatment protocols cannot provide treatment of dementia-related diseases so many methods are being developed to slow the progression of the disease. First of all, the

patient's life is organized with nutrition, physical activity and nutritional supplements.

These methods are followed by other holistic medicine techniques, aromatherapy, music therapy and painting therapy (https://remem.eu/, https://aile.gov.tr). Preservation of the grey matter in the hippocampus part of the brain is important for healthy cognition. It is observed that inactive regions of the brain are activated brain movements increase significantly and recall skills improve when elderly individuals play digital games. For this reason, there are studies suggesting that appropriate digital games can be developed for Alzheimer's and dementia disorders of elderly individuals.

Computer games were developed for hobby purposes by scientists in the world, especially in America and Japan.

The video game adventure that started in the 1970s became a sector with the emergence of console games. The period that started with the bankruptcy of game companies in America in the early 1980s returned as a giant game industry within two years. Today, the game industry is the largest of cinema and similar entertainment sectors.

Towards the middle of the 80s in Turkey, a video game curiosity started outside the house with Atari and inside the house with Commodore gaming computer. Turkey closely followed all game industry elements in the developing world. Today, e-sport competitions are organized in Turkey as in the world. Today, there is even an e-sports federation in Turkey (http://tesfed.gov.tr/).

The widespread use of the Internet and mobile device technologies such as Smartphone’s and tablets provide a huge market for the rapidly developing gaming industry.

This effect brings many social gains as well as economic gains. The gaming industry, which contributes greatly to social development in the fields of education and health, can also support dementia patients who do not yet have a cure.

However, diseases such as dementia and Alzheimer's disease progress in stages. Digital games (computer games, video games, console games, mobile phone games, etc.) have started to be used to delay the final stage, in other words to slow down the progression of the disease. Especially memory-enhancing games puzzle games, reminder games, word games are used for this purpose. Mobile applications are also being developed for patient relatives (Kapıkıran et al, 2022).

Playing 3D platform video games has previously been shown to support grey matter in the hippocampus in young adults. Greg L. Batı et al. (2017) tested the effect of platform video game training (e.g. Super Mario 64) on grey matter in the hippocampus, cerebellum, and dorso lateral prefrontal cortex (DLPFC) regions of older adults, and older adults aged 55 to 75 years were randomly assigned to three groups.

The video game experimental group received 3D platform video game training over a 6-month period in addition an active control group received a series of self-guided, computerized music (piano) lessons. A non-contact control group received no intervention. After training, a within-subject increase in grey matter within the hippocampus was recorded as significant only in the game training group, replicating the results observed in young adults.

However, active control music training led to a within-subject increase in the DLPFC, while both play and music training led to growth in the cerebellum. In contrast, the control group showed significant grey matter loss in the hippocampus, cerebellum and DLPFC (West et al.2017).

Briefly; 3D platform video game training resulted in positive grey matter increases in brain regions known to decline with age and associated with age-related cognitive decline.

The American AARP and the Entertainment Software Association (ESA) conducted a survey between 9 March and 17 March 2016 among a nationally representative sample of 2,964 adults

aged 50 years and older (gamers, n=1510; non-gamers, n=1454).

In a study to determine how video games can positively affect people over 50, the study commissioned a survey of Americans over 50 to uncover their gaming habits and answer questions about where they play video games, the types of games they play, their reasons for playing, and who they play with. In this survey, according to the findings those gamers identified according to questions about the ownership of various systems/devices.

Four in ten adults aged above 50 are gamers (38%), while 62% are not gamers. Gamers aged 50+ most commonly use computers/laptops (59%) and phones/other mobile devices (57%) to play video games.

Nearly six in ten gamers (59%) say they play online. 37% of 50-59 year olds and 43% of those over 60 say they play games every day. Card/pieces games (46%) and puzzle/logic games (44%), followed by remote knowledge/word/traditional board video games, top the list of respondents' three favorite video game genres. Half of online gamers report playing more online games today than they did five years ago.

The most important reason why gamers play video games is to have fun. 26% say this is an extremely important reason and 52% say it is very important (West et al (2017).

1.1 Literature review

Smirni et al(2021) in their research observed that an increasing number of children and adolescents play video games (VG) occupying them all the time. The pandemic period has significantly reduced outdoor activities and direct interpersonal relationships, so the use of video games (VGs) can become the response to stress and fear of illness. VGs and their practical implications have become an issue of increasing interest from a medical point of view and how to use them beneficially for health.

Primack et al. (2012) in their research mention that video games can be associated with many negative health consequences but at the same time can be useful for therapeutic purposes.

Lougheed (2019) shows the utility of using video games to teach clinical knowledge and skills, and the involvement of supporters in games is also a way in medical training by integrating solid principles of learning and skill acquisition.

Also Kato (2010) noted that video games have been used strategically to treat a number of health problems among patients, here they mentioned burns, asthma, cancer patients forgetting the pain by engaging in games. Another important role of games is the development of a mechanism of action and the ability of patients to increase motivation. Video games in health care offer innovative ways to use existing commercial health games surgical training or training. Personalized games help patients to be more receptive to treatment.

The benefits consist of the combination of patient focus and neurotransmitters increases when playing games help strengthen neural circuits, giving the brain a real workout. Video games can also improve mental skills such as: logic problems, coordination of movement eye-hands, motor coordination.

Last but not least, nowadays society suffers from a new epidemic of loneliness, and games can be a way of socializing or keeping in touch with family. Another example would be communicating with autistic children, who may have challenges with traditional ways of communicating (https://www.health.harvard.edu/blog/the-health-effects-of-too-much-gaming-2020122221645).

Griffiths (2002), Li (2011), Primack (2013), Jones (2014) and later Pallavicini et al (2018) emphasized in their research the role of video games which, unlike TV shows and movies, are

interactive and require attention to details and task management.

Another plus was shown by the fact that each task that the patient/player completes will be rewarded with experience points and a measurement of the improvement of the user's skills, who is also awarded with imaginary trophies symbolizing his achievement. This is what makes video games incredibly stimulating.

Baranowski et al (2019), Romanelli et al (2020), Stenseng et al (2020) paid attention to another impact of video games, but this time on childhood and childhood obesity.

Huang and Cheng (2020) presents the benefits of video games on cognitive function have been proven by increasing evidence. The activation of brain function in association with video games has an effect on the attention capacity and the visual and spatial capacity of the brain, but more attention must be paid to the types of video games that must be classified carefully.

Zhao et al (2022) demonstrated that active video games are even beneficial for elderly and physically inactive people. Aging is often associated with a decline in physical fitness and cognitive function, and active video games have been shown to be beneficial for the physical health of older adults, showing changes in behavior and fitness and cognitive function in older adults.

van der Schyff et al. (2023) considered the unique perspectives of digitally connected people regarding the provision of mental health services, but interventions must be designed to meet their needs with a greater likelihood of success.

Klasnja et al. (2022) studied reaction time in both sports and video games, as participants' movements are conditioned by different visual, acoustic and somatic sensory signals.

Damaševičius, et al. (2023) considered the concept of serious game, they consider it a type of game designed for a main purpose, other than entertainment. In contrast, serious games are intended to achieve specific goals, such as education, training, or health promotion. The purpose of serious games is to engage players in a way that is both enjoyable and effective in achieving intended learning or behavior change outcomes. Their study found that serious games and gamification techniques are increasingly being used for a wide range of health conditions, and the focus is shifting to using mobile and digital platforms, virtual reality and machine learning to personalize and adapt interventions.

Existing research gaps include lack of standardization in development and evaluation, insufficient understanding of mechanisms of action. These research gaps highlight the need for further research to fully understand the potential and limitations of serious games and gamification for health and how to apply them effectively.

Video games have a use in medicine but in different specialized fields. Comeras-Chueca et al. (2022) studied the connection between effort and physical illiteracy and motor skills in overweight or obese children.

Boj et al. (2018) paid attention to the elderly and digital free time, especially the development of games and applications that link the gaming experience with beneficial effects for the user. Some of these benefits occur at the cognitive level, stimulating the intellectual activity of adults through playful experiences that combine audio-visual entertainment with brain training. Technologies for the elderly are intended to transform playgrounds into scenarios for a set of interactive digital games.

2 RESEARCH CONTEXT

Alzheimer's disease is one of the health conditions being targeted by mobile application developers. Indeed, the efficacy of using digital tools and mobile phone applications in fighting Alzheimer's has been demonstrated the results proved that a mobile application could improve cognitive function in elderly patients.

The partners Identify the non-academic categories of mobile application used until now and summary of non-academic applications it is presented in the table below:

Application	Features	Added technology
Backup Memory	Helps patients to remember quickly by showing them related pictures; defines patient location	Bluetooth ; GPS
Tweri	Tracks the location of Alzheimer's patients	GPS
Test Memory Game	Improves memory by exercises	Just Android application
Prevent Alzheimer	Improves and trains memory through games	Just Android application

The partners identify a nich on the actual application in use of the brain games and other computer-based stimulation therapy has given new light to healthcare professionals, caregivers, and the patients themselves. Also another target establish was the Family members because they often play a key caregiving role, especially in the initial stages of what is typically a slow decline. The staggering numbers of home health care are on top of an already struggling health care system, one that has not made the strides necessary to address this inevitable future.

Taking in consideration the scientists researchs the partners are agree that new and effective prevention strategies need to be developed following the three direction of the project like in Figure 1:

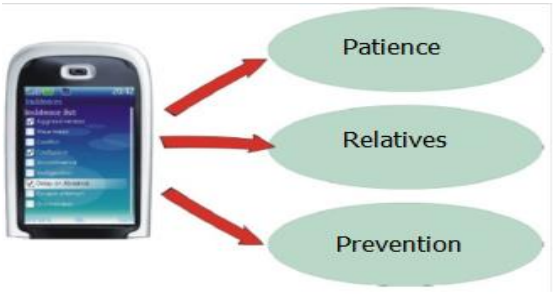

Figure 1. Direction of project development and Implementation

The project proposes an innovative methodology based on the creative use of digitalization and its tools in the context of caring for people with Alzheimer's disease. This project has as final product the application for mobile telephone as well as the questionnaire that was piloted in: Romania, Italy and Turkey.

A set of tools is also proposed to improve communication between people and people with Alzheimer's, using role play and the art of storytelling.

In recent years, international research has focused on families caring for the elderly with dementia (Zarit et al. 1985, Crespo (2005); Aneshensel et al. 1995; 2000).

The role identity theory of Montgomery and Kosloski has also been fundamental to my own research, as it makes the often dramatic role changes in the caregiver family measurable (Montgomery-Kosloski 2013).

When evaluating the results of the examination, we can identify different factors of housing in residential housing: caring family members, as a result of dementia, face a number of behavioral problems and ongoing losses; they have no experience or support, while they face daily helplessness and often loss of hope.

Technology has enormous potential to benefit the lives of the elderly, enabling them to live independently and providing support in the

implementation of preventive health care, health education.

During the project, improvements in communication skills, social functionality and patient autonomy were observed.

This project had the ability to facilitate the therapeutic relationship between patients and the caregiver, to help patients to adapt, to remember and to better understand their own life using the new technology.

3 APPLICATIVE RESEARCH

In this study, randomized research was conducted on the gaming habits of individuals over the age of 50's from Turkey.

In the study, a two-stage questionnaire form was used. Firstly, the interest of the individuals in digital games was questioned, and for those who were not interested in digital games the questionnaire stops.

Also in the first part of the questionnaire, it was questioned whether the respondents played computer games and their demographic information was evaluated. In the second part of questionnaire the respondents answer to the questions regarding the types of games they chose, motives and why they chose these games were investigated, and the contributions of these games on issues such as focusing, processing skills, and their effects on memory were investigated.

The participants participated in the study on a voluntary basis, identity information and other data of the participants were not stored.

The target group was selected especially from adults over 50 years old, taking in consideration that they are not using too much digital technology.

This study was conducted to determine the interest of individuals over the age of 50's in mobile applications and games.

Ethics committee approval for the survey study was obtained from Kırklareli University with the decision dated 22.03.2021 with number: E-35523585-199-7110.

The questionnaire forms consisting of two parts in Turkish and prepared with the help of Google Forms were distributed through social and personal networks such as WhatsApp, e-mail, Face book and Instagram. The number of questionnaires evaluated in the study was 310 respondents. In the first part, 166 questionnaires were included in the evaluation and 144 questionnaires were included in the second part. The data were evaluated using SPSS software. The study's proposal also aimed to identify the factors that influence access to the use of digital technology but also the barriers that stop informing people.

Figure 2 shows a schematic working model adapted after Boca and Kara (2020) model of research.

The questionnaire was structured in several parts:

Part1: Individual characteristics gender (female, male); age of respondents; marital status; residence;

Part 2: to identify the level of education;

Part3: frequency of using digital technology, identify the time frame that respondents use on the internet;

Part 4: factors affecting respondents when they choose video games;

A Likert scale were used from 1 to 5 where 1= not effective at all, 2= not effective, 3= can't decide, 4= effective and 5= very effective.

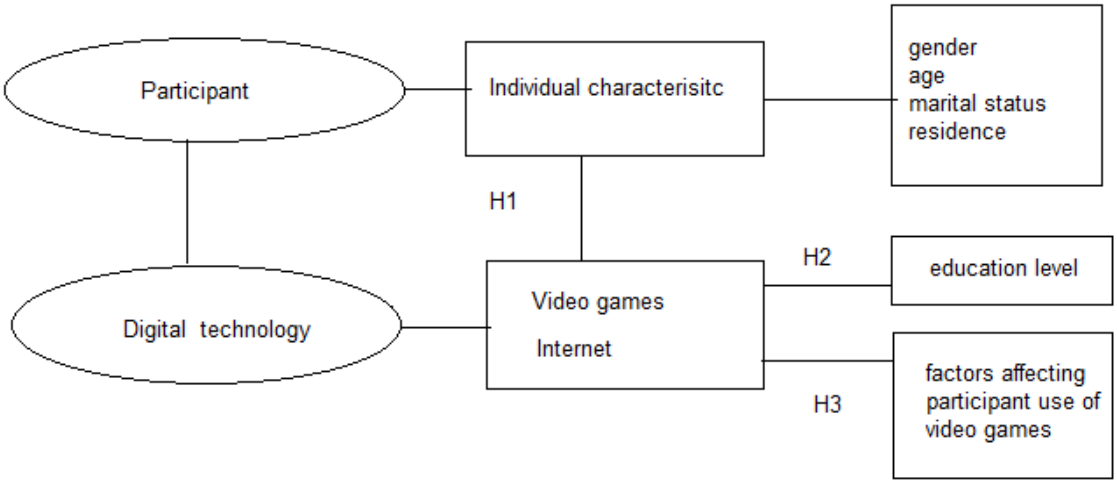

Figure 2. Research model adapted after Boca and Kara (2020)

Hypothesis of study:
H1: participants' characteristics effect their behavior towards video games;
H2: participants' education level effects their used of video games;
H3; participants' using of video games are effect by external factors.
All hypothesis were demonstrated.

4 RESEARCH RESULTS AND DEBATES

The study, which was carried out with the participation of 310 respondents over the age of 50, consisted of two parts.

The selection of participants was done in the first part, in addition to the demographic information of all participants who participated in the survey, they were asked if they are playing digital games, those who declared that they did not play digital games ended the survey.

In the second part, the respondents who declared that they are playing digital games were questioned about the frequency of playing games, the age at which they first played digital games, and the reasons for playing games.

Among the individuals aged 50 years and over, the findings regarding the personal information of those who do not play computer games are given in Table 1.

When Table 1 is analyzed, it is seen that more than 40% of the individuals over the age of 50 who do not play computer games are between the ages of 50-55.

One fifth is in the 56-60 age range. The rate of those aged 61-65 is around 10%. It is seen that those aged 66 and over are around 25%.

Accordingly, it can be said that there is a great density between the ages of 50-55 in terms of age distribution. From this point of view, it can be interpreted that the majority of the participants are in the end of adulthood and the first stage of old age.

In terms of gender, it can be interpreted that the participants have almost equal gender distribution.

More than 45% of the participants are retired. Approximately one fifth of the respondents stated that they were employed in a salaried job. The rate of self-employed is 15.7%. Nearly 20% of the participants stated that they were unemployed. In terms of education level, it was observed that almost 40% of the participants were university (associate and bachelor's degree) graduates. Primary school, middle school and high school graduates are close to half of the total number of participants who do not play games.

Table 1. Information on Demographic Characteristics of Individuals Who Do Not Play Computer and Puzzle Games

Variable	Category	Frequency f	Percentage %
Age	Between 50-55	72	43,4
	Between 56-60	34	20,5
	Between 61-65	18	10,8
	Between 66-70	26	15,7
	Between 71-75	9	5,4
	76 or above	7	4,2
	Total	**166**	**100**
Gender	Woman	86	51,8
	Man	80	48,2
	Total	166	100
Employment Status	Retired	76	45,8
	Unemployed	30	18,1
	Self-employed	26	15,7
	Salaried Employee	34	20,5
	Total	**166**	**100**
Education Level	Primary School	43	25,9
	Middle School	12	7,2
	High School	25	15,1
	Bachelor's Degree	66	39,8
	Postgraduate Degree	10	6,0
	PhD	10	6,0
	Total	**166**	**100**
Marital Status	Married	143	86,1
	Single	23	13,9
	Total	**166**	**100**
Residence	Lives with his/her family	141	84,9
	Lives alone	25	15,1
	Total	**166**	**100**

Accordingly, it can be interpreted that the rate of playing games decreases as the level of education decreases.

It is noteworthy that 12% of the participants are postgraduate graduates.

As a result of these findings, it can be interpreted that the education level of the participants is relatively low. It is seen that approximately 86% of the participants are married and the rate of singles is low.

Similarly, the rate of participants living with their families is close to 85%. The rate of participants living alone is around 15%.

The second part of the questionnaire consists of the information of those who declared that they play games.

Table 2 presents the findings regarding the personal information of the individuals aged 50 and over who play computer and puzzle games.

When Table 2 is analyzed, it is seen that approximately half of those who play computer games are between the ages of 50-55. One fifth is in the 56-60 age range.

Table 2. Information on Demographic Characteristics of Computer and Puzzle Game Playing Participants

Variable	Category	Frequency f	Percentage %
Age	Between 50-55	73	50,7
	Between 56-60	29	20,1
	Between 61-65	22	15,3
	Between 66-70	13	9,0
	Between 71-75	3	2,1
	Between 76 or above	4	2,8
	Total	**144**	**100**
Gender	Woman	71	49,3
	Man	73	50,7
	Total	**144**	**100**
Employment Status	Retired	63	43,8
	Unemployed	6	4,2
	Self-employed	32	22,2
	Salaried Employee	43	29,9
	Total	**144**	**100**
Education Level	Primary School	6	4,2
	Middle School	7	4,9
	High School	19	13,2
	Bachelor's Degree	78	54,2
	Postgraduate Degree	22	15,3
	PhD	12	8,3
	Total	**144**	**100**
Marital Status	Married	121	84
	Single	23	16
	Total	**144**	**100**
Residence	Lives with his/her family	122	84,7
	Lives alone	22	15,3
	Total	**144**	**100**

The rate of those between the ages of 61-65 is around 15%. The percentage of those aged 66 and over is very low. Accordingly, it can be said that there is a great density between the ages of 50-55 in terms of age distribution.

From this point of view, it can be interpreted that the majority of the participants are in the end of adulthood and the first stage of old age.

In terms of gender, it can be interpreted that the participants have almost equal gender distribution. More than 40% of the participants are retired. Approximately one third of the participants stated that they were employed in a salaried job.

The rate of self-employed is 22.20%. Very few of the participants (4.2%) stated that they

were unemployed. In terms of education level, it was observed that more than 50% of the participants were university (associate and bachelor's degree) graduates. Primary, middle and high school graduates are around 10%. It is noteworthy that more than 20% of the participants are postgraduate graduates.

In total, more than 70% of the participants have a university degree or higher. As a result of these findings, it can be interpreted that the educational level of the participants is relatively high. It is seen that 84% of the participants are married and the rate of singles is low. Similarly, the rate of participants living with their families is close to 85%.

The rate of participants living alone is around 15%. The findings on how often the participants play games are given in Table 3.

Table 3. Findings Regarding the Frequency of Playing Games

Variable	**Category**	**Frequency f**	**Percentage %**
Game Playing Frequency	Once a week	44	30,6
	Everyday	85	59
	Once a month	15	10,4
	Total	144	100

The rate of those who play games once a week is around 30%. From this point of view, it can be interpreted that the participants play games frequently. The rate of those who play games once a month is around 10%.

The answers of the participants to the question "Have you played games with computers and computer equipment (including same consoles, portable gaming devices, computers, laptops, mobile phones, tablets, cable TV) in the last month?" are given in Table 4.

Table 4. Findings Regarding the Frequency of Game Playing in the Last One Month

Variable	**Category**	**Frequency f**	**Percentage %**
Game Playing Frequency in the Last Month	Always	36	25
	Occasionally	108	75
	Total	**144**	**100**

When Table 4 was analyzed, it was seen that 75% of the participants played games frequently in the last month. One fourth of the participants stated that they always played games in the last month. Based on this point of view, it can be said that playing games is a popular activity among the participants.

The findings regarding the age at which the participants played their first computer games are given in Table 5. When table is analyzed, it can be interpreted that the age of the participants' first computer game is distributed very diversely.

Table 5. Findings Regarding the Age of First Computer Game Playing

Variable	Category	Frequency f	Percentage %
Age of First Computer Play	12-15 years old	12	8,3
	16-20 years old	16	11,1
	21-25 years old	12	8,3
	26-30 years old	19	13,2
	31-35 years old	24	16,7
	36-40 years old	21	14,6
	41-45 years old	12	8,3
	46 or above	28	19,4
	Total	**144**	**100**

Participants who stated that they played their first computer game between the ages of 12-15, 21-25 and 41-45 are around 8%.

The rate of those who played their first computer game between the ages of 16-20 is around 10%.

The rate of those who stated that they played their first computer game in the 26-30 age range is 13.2%.

The rates of those between the ages of 31-35 and 36-40 are close to each other.

The rate of those who stated that they played their first computer game after the age of 46 is around 20%.

According to these findings, it can be interpreted that the participants met computer games at a very late age.

The factors affecting the participants' playing computer games and the response frequencies of these factors are shown in Table 6.

As can be seen in Table 6, the factors affecting the participants' playing games differ according to each questionnaire item.

When the arithmetic mean of the answers given to the first item of the questionnaire, "Learning something new", is analyzed $\overline{X}$ =3.55, it can be said that the participants' desire to learn something new on playing games is at a medium level.

When the answers given to this item were analyzed in detail, the most frequently selected option was "very effective" with 30.6%.

When the arithmetic mean of the answers given to the second item of the questionnaire, "Keeping the memory strong" $\overline{X}$ =3.97, it can be concluded that keeping the memory strong is highly effective in the participants' playing games.

As the age increases, engaging in activities that improve memory has an important place especially in preventing the progression of Alzheimer's disease.

Table 6. Factors Affecting the Participants' Game Playing

Articles	Answer Choices											
	Not effective at all		Not effective		Can't decide		Effective		Very effective			
	f	%	F	%	f	%	f	%	f	%	$\overline{X}$	S
1. Learn something new	13	9	17	11,8	35	24,3	35	24,3	44	30,6	3,55	1,28
2. Keeping memory strong	8	5,6	10	6,9	24	16,7	37	25,7	65	45,1	3,97	1,18
3. Having fun	4	2,8	5	3,5	18	12,5	39	27,1	78	54,2	4,26	,99
4. Problem solving	15	10,4	16	11,1	33	22,9	36	25	44	30,6	3,54	1,31
5. Develop new ideas and skills	10	6,9	27	18,8	35	24,3	27	18,8	45	31,3	3,48	1,29
6. Spending time with family	37	25,7	29	20,1	31	21,5	17	11,8	30	20,8	2,82	1,47
7. Spending time with friends	39	27,1	28	19,4	30	20,8	21	14,6	26	18,1	2,77	1,45
8. Socializing	33	22,9	32	22,2	36	25	19	13,2	24	16,7	2,78	1,38
9. Stress relief	8	5,6	8	5,6	14	9,7	47	32,6	67	46,5	4,09	1,13

The fact that 45.1% of the participants chose the option "Very effective" can also be evaluated in this respect.

When the arithmetic mean of the answers given to the third item of the questionnaire, "Having fun", is analyzed $\overline{X}$ =4.26 it is seen that fun is an important factor on the participants' playing games.

As a matter of fact, it is seen that the item with the highest average among all items in the questionnaire is the item "Having Fun". In this respect, the primary motivation for playing games is due to the fact that it is an entertaining activity.

When the answers given to this item were analyzed in detail, it was seen that the participants marked "effective" and "very effective" options at a rate exceeding 75%. When the arithmetic mean of the answers given to the fourth item of the questionnaire, "Problem solving" $\overline{X}$ =3.54, it can be interpreted that the desire for problem solving is moderately effective in the participants' motivation to play games.

When the answers given to this item were analyzed in detail, the most frequently selected option was "very effective" with 30.6%. Those who chose "not effective at all" and "not effective" were around 20%. When the arithmetic mean $\overline{X}$ =3.48 of the answers given to the fifth item of the questionnaire, "Developing new ideas and skills", is analyzed, it can be interpreted that the desire to develop new ideas and skills is moderately effective in the participants' motivation to play games.

More than 30% of the participants stated that acquiring new ideas and skills was very effective on their motivation to play games.

On the other hand, approximately 26% of the participants stated that acquiring new ideas and skills was not very effective on their motivation to play games.

When the arithmetic mean of the answers given to the sixth item of the questionnaire, "Spending time with family" $\overline{X}$ =2.82 it can be interpreted that spending time with family has a little effect on the participants' motivation to play games.

This may be due to the fact that the games are mostly played individually and are usually on social networks and the internet.

Similarly, the arithmetic mean of the answers given to the seventh item of the questionnaire, "Spending time with friends", is 2.77.

This situation can be explained in parallel with the above explanations. Because today's games are played on computers and mobile devices and as a result of this situation, it can be interpreted that individuals play more games when they are alone.

When the arithmetic mean of the answers given to the eighth item of the questionnaire, "Socializing", is examined $\overline{X}$ =2.78, it is seen that socializing is not a very important factor on the participants' game playing. Accordingly, it can be said that the primary purpose of games played on social networks and the internet is not socialization.

When the arithmetic mean of the answers given to the ninth item of the questionnaire, "relieving stress", is analyzed $\overline{X}$ =4.09, it is seen that stress relief is an important factor on the participants' playing games.

As a matter of fact, it is seen that the item with the second highest mean among all items in the questionnaire is "relieving stress".

In this respect, one of the primary motivation sources of playing games is that it is an entertaining and stress-relieving activity.

When the answers given to this item were analyzed in detail, it was seen that the participants marked "effective" and "very effective" options at a rate exceeding 75%.

5 CONCLUSION

The study, which was carried out with the participation of a total of 310 people over the age of 50, consisted of two parts. In the first part, in addition to the demographic information of all participants who participated in the survey, they were asked to play digital games, and those who declared that they did not play digital games ended the survey.

In the second part, the demographic structure of those who declared that they play digital games, the frequency of playing games, the age at which they first played digital games, and the reasons for playing games were questioned.

Accordingly, the rate of digital game playing in Turkey above the age of 50 is 54% for those who do not play digital games and 46% for those who play digital games, which can be expressed as half and half.

Approximately two thirds of the participants stated that they play games every day. The rate of those who play games once a week is around 3%. From this point of view, it can be interpreted that the participants play games frequently.

When the findings regarding the age at which the participants played their first computer games are analyzed, it can be interpreted that the age at which the participants played their first computer game varied widely. The rate of those who stated that they played their first computer game after the age of 46 is around 20%. This finding is actually a real finding when we look at the relationship between the history of computer games in the world and the age of the respondents.

When the factors that are effective in the participants' playing games and the response frequencies of these factors are analyzed; "having fun" ranks first with an arithmetic mean of 4,26, "relieving stress" ranks fifth with an arithmetic mean of 4,09, "keeping memory strong" ranks third with an arithmetic mean of 3,97, "learning something new" ranks third with an arithmetic mean of 3.55 and "solving problems" ranks fifth with an arithmetic mean of 3.54.

In our study, the results obtained in the context of the age range and game interests of the game players gave results proportional to the history of computers and digital games. The evaluation of people over 50 years of age in terms of the reasons for playing games and their expectations from the game is a clear indication that there is a readiness to support the players in terms of memory strengthening.

Turkish Statistical Institute (TUIK) predicts the ratio of the elderly population to the general population as 10% in 2023.

While diseases such as dementia and dementia-related Alzheimer's disease are also increasing due to the population, specially developed or not, it can contribute to the elderly population.

While terms such as tele-health, tele-medicine, tele-care enter our daily lives, we believe that game software, which has become an industry in the global world, can support dementia patient candidates and patients.

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