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www.bidgeyayinlari.com.tr - bidgeyayinlari@gmail.com

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PREFACE

The book consists of four chapters containing studies on empathy, patient safety and childhood problems, and each chapter provides current information. In the study of first chapter, it was investigated that the attitudes and empathy levels of nursing students toward old people. The data was collected from nursing students by using affective and cognitive measure of empathy and attitudes toward old people scales. In the study of second chapter, it was investigated that the effect of childhood traumas on the tendency to violence. This study utilized a descriptive study design. The target population of the study included adults with various socio-economic levels who lived in this city. Childhood trauma is the neglect of children's rights and is an important public health problem. WHO reported that consequences of childhood traumas include impaired lifelong physical and mental health, and the social and occupational outcomes can ultimately slow a country's economic and social development. In the study of third chapter, it was explained that gaming addiction in adolescents. In the study, the positive and negative effects of game addiction were mentioned. Additionally, interventions that can be used to cope with game addiction in adolescents were explained. Adolescence period is the period in which digital technology is used the most. In the study of fourth chapter, it was explained that patient safety in the operating room.

Editor

Assoc Prof. Dr. Gülcan BAKAN

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CHAPTER I

Attitudes and Empathy Levels of Nursing Students towards the Elderly

Volkan KINA[1]
Zümrüt AKGÜN ŞAHİN[2]

Introduction

Old people are generally accepted by the society as individuals who impose economic, social, and cultural burdens on others. Negative behaviors and attitudes toward old people may occur depending on the fact that they face such problems (Gökbunar et al., 2016). The attitudes of the society toward the concepts of elderly, old age, and aging as well as the attitudes of healthcare professionals toward these concepts are of prime importance. The

[1] Öğr. Gör., Ardahan Üniversitesi , Sağlık Bakım Hizmetleri, Orcıd: 0000-0003-0190-0249
[2] Doç. Dr., Kafkas Üniversitesi, İç Hastalıkları Hemşireliği, Orcıd: 0000-0001-7141-273X

attitudes of the society toward old people, their socio-cultural structures, the individuals' perception on old age, the importance attached to the old people reflect on all healthcare and social services offered to these people in that society. Thereupon, care for old people in the field of healthcare services is regarded as an undesirable field of work as in many areas and cannot develop rapidly enough (Soyuer et al., 2010).

The nursing profession focuses on human. Therefore, it is crucial for student nurses studying at nursing education institutions to have advanced knowledge about the elderly care, old age, and aging (Uysal et al., 2020). Negative attitudes and approaches toward these subjects can adversely affect the attitudes and empathy levels of students toward the old people (Baysal et al., 2019). For this reason, it is primarily important to determine the attitudes and empathy levels of nursing students toward old people, so that the deficiencies in this subject can be eliminated and the old people can receive better care and treatment (Duru-Aşiret 2015). When nursing students have sufficient knowledge about old age and aging, this has a significant effect on the positive attitudes and behaviors they will exhibit in providing care and treatment to old people, enhances the quality of care and treatment for the elderly by elevating this level of knowledge, and indicates that nursing education institutions have an important place (Kulakçı 2010). For this reason, it is predicted that both working nurses and nurse candidates' attitudes, behaviors and empathy levels related to elderly care, old age and aging will be effective in the care and treatment of old people in their professional lives (Adıbelli et al., 2013).

Upon the literature review, a limited number of related studies have been determined. This study was conducted to examine the Attitudes and Empathy Levels of Nursing Students toward Old People.

Materials and Method

Study Design and Sample

The study was conducted with the students of the Faculty of Health Sciences, Department of Nursing at a university in Eastern Anatolia between 01.11.2020 and 01.06.2021. The population consisted of a total of 780 nursing students studying in the Nursing Departments of the Faculty of Health Sciences in the 2020-2021 academic year. The study aimed to reach all the students of the nursing department. For this reason, no sampling method was used. All students who were studying at the Faculty of Health Sciences, Department of Nursing and agreed to participate in the study were included in the study. Due to the COVID-19 pandemic, data collection forms were applied to the students attending the classes between the data collection dates through face-to-face interview, and to the students receiving online education through Microsoft Teams and online platforms (whatsapp). The participants filled out data collection forms via computer or smartphone over a website link. The online forms also included a section that informed potential respondents about purpose, anonymity, and confidentiality. They filled out the forms on the website and clicked the submit button so that they completed it. It took averagely 30-35 minutes for the students participating in the study to complete the data collection forms. 455 students who filled in the data collection forms incompletely or incorrectly, and were infected with COVID-19 during the pandemic were excluded from the study. The study was completed with 325 students. 41.1% of the population was reached.

Data Collection and Tools

Characteristics Questionnaire: This form, which was prepared upon the literature review, includes questions such as the students' age, gender, class, marital status, income status, their mothers and fathers' employment status and education level, presence of a person over the age of 65 in their family, the degree of affinity if any, how many years they has lived with this old person,

their satisfaction with living with this old person (Duyan and Gelbal 2013; Alkaya and Okuyan 2017; Adıbelli et al., 2013).

Kogan Attitudes Toward Old People Scale: This scale, developed by Nathan Kogan in 1961 to reveal the attitudes of individuals toward old people, is known as Kogan Attitudes Toward Old People Scale ("KOPS"). Although "KOPS" was originally developed to be applied to actively working healthcare professionals, it has been used in various studies to reveal the attitudes of all people in the society toward old people. This scale has a total of 34 items that can be understood by all segments of the society. The items in this 6-point Likert-type scale are rated with the following options; Strongly agree, Slightly agree, Agree, Disagree, Slightly disagree, Strongly disagree. The scale has 17 positive statements and 17 negative statements. The items in the scale are scored from 1 to 6 to reach the total score of the scale. The total score ranges between 34 and 204 points, and the higher the score, the higher the attitude toward old people (Kogan 1961). Numerous studies have been conducted on the validity and reliability of the Kogan Attitudes Toward Old People Scale. Kogan, the author of the scale, evaluated the positive and negative items of this scale as a separate scale. The first evaluation group of this scale, which was evaluated on two different groups, included psychology students. In the evaluation made on this group, it was found that the Cronbach's alpha values of the negative and positive subscales were 0.76 and 0.77, respectively. The second evaluation group included the employees of an elderly care institution. In the evaluation of this group, it was determined that the Cronbach's alpha values of the negative and positive subscales were 0.83 and 0.73, respectively (Kogan 1961). In the evaluation made by Hilt in 1999, the scale was not divided as positive and negative, but was assessed as a whole. As a result of the evaluation, the Cronbach's alpha value of the scale was found to be 0.81. In this study, the Cronbach's alpha value of the Kogan Attitudes Toward Old People Scale was determined as 0.76.

Affective and Cognitive Measure of Empathy: Affective and Cognitive Measure of Empathy (ACME) was developed by Vachon and Lynam in 2015 to determine the affective and cognitive empathy levels of individuals. In 2020, Yukay Yuksel et al., conducted Turkish validity and reliability study of this scale for the first time. ACME consists of 36 items including 12 items in each of 3 subscales. The items of the scale are rated using a 5-point Likert scale as I totally agree, agree, undecided, disagree, absolutely disagree. High scores obtained from each subscale of the scale signify that the level of related empathy is high. Total score of the subscales ranges between 12 and 60 points. In addition, the item 22 of the scale is scored reversely (Appendix-3). In this study, the Cronbach's alpha reliability coefficient was 0.936 for the overall Affective and Cognitive Measure of Empathy, 0.851 in the Cognitive Empathy subscale, 0.85 in the Affective Resonance subscale, and 0.918 in the Affective Dissonance subscale.

Data Analysis

The data were analyzed using the Statistical Package for the Social Science (SPSS) 22.0 software. The Kolmogorov-Smirnov test was used for the distribution of the data. Mann Whitney-U Test and Kruskal-Wallis Test were used in two groups to determine the differences between the variables. Spearman's Rank correlation analysis test was used to reveal the correlation between the scales. When examining the differences between groups, 0.05 was accepted as the level of significance and $p < 0.05$ was regarded as statistically significant.

Ethical Considerations

The approval was obtained from the Non-Interventional Research Ethics Committee (approval date: 30.10.2020; approval no. 2020/9). Verbal and written consent to participate in the study was obtained from each student.

Results

Table 1 shows the demographic characteristics of the nursing students. According to the table, 78.2% (254) of the students were female and 21.8% (71) were male. 90.1% (322) of the students were single. 23.1% (75) were the 1st-year students, 25.8% (84) were the 2nd-year students, 25.2% (82) were the 3rd -year students, and 25.8% (84) were the 4th-year students. 20.9% (68) of the students stated that they were residing in the village, 30.8% (100) in the district and 48.3% (157) in the city. When examining the income status of the family, 57.2% (186) of the students stated that their income was equal to their expenses, 14.5% (47) stated that their income was more than their expenses, and 28.3% (92) stated that their income was less than their expenses. 36.3% (118) of the students had 1-3 siblings and 63.7% (207) had 4 or more siblings. When examining the education level of the fathers of the students, it was determined that the fathers were mostly primary school (112) and secondary school (106) graduates. When examining the education level of their mothers, it was found that illiterate ones (121) and primary school (99) graduates were more. While the fathers of 64% (208) of the students were employed, only the mothers of 9.2% (30) were employed. While 79.4% (258) of the students stated that they had a relative aged 65 and over, 23.7% (77) of the students stated that they lived with an elderly person at home.

Table 2 shows the descriptive statistics of the participants for ACME and its subscales, and KOPS. As a result of the analysis, it was determined that the total mean score of ACME was 143.80±21.920, the mean score of the "Cognitive Empathy" subscale was 44.45±7.416, the mean score of the "Affective Resonance" subscale was 48.08±8.579 and the mean score of "Affective Dissonance" subscale was 51.27±9.639. This showed that the empathy levels of the students were high. The KOPS mean score was determined as 127.30±15.070. It can be asserted that students' attitudes toward old people were also at a high level.

Table 3 shows the distribution of the mean scores of ACME and its subscales and KOPS according to the demographic characteristics of the students. It was determined that the difference between the groups in terms of the variables of gender, mother's education level and class level was statistically significant in the total score of ACME (**p<0.05**). However, there was no statistically significant difference between the groups in terms of the variables of age, number of siblings, family income, mother and father employment status, father's education level, marital status, living with an old person, the presence of relatives aged 65 and over, and place of residence (p> 0.05). In the "Cognitive Empathy" subscale, the difference was statistically significant between the groups in terms of variables of gender, class level, family income, mother's education level, and the status of having a relative over the age of 65 years (**p<0.05**). However, there was no statistically significant difference between the groups in terms of variables of age, marital status, place of residence, number of siblings, father's education level, father's employment status, mother's employment status, and the status of living with an old person (p>0.05). It was determined that the difference between the groups in terms of the variables of gender, residence place, and mother's education level was statistically significant in the Affective Resonance subscale (**p<0.05**). However, there was no statistically significant difference between the groups in terms of the variables of age, marital status, number of siblings, class level, family income, father's education level, father's employment status, mother's employment status, the status of having a relative over the age of 65 years, and the status of living with the old person (p>0.05). In the "Affective Dissonance" subscale, there was a statistically significant difference between the groups in terms of the variables of gender, marital status, education level of the mother, employment status of the mother and the status of living with the old person (**p<0.05**). However, there was no statistically significant difference between the groups in terms of age, number of siblings, class level, family income, father's

education level, father's employment status, the status of having a relative over the age of 65 years, and residence place. ($p>0.05$).

As can be seen in Table 4, it was determined that the difference between the groups in terms of the variable of marital status was statistically significant in the total score of KOPS (**$p<0.05$**). However, there was no statistically significant difference between the groups in terms of the variables of age, gender, mother's education level, class level, number of siblings, family income, father's education level, father's employment status, mother's employment status, status of living with the old person, status of having a relative over the age of 65 years, and residence place ($p>0.05$).

In Table 5, Spearman's Rank correlation analysis was performed to determine the correlation between ACME and its subscales and KOPS. When considering the results of the analysis, a moderately significant positive correlation was found between the total score of ACME and KOPS [**$r_{(325)} = 0.339; p<0.05$**]. When considering the correlation between KOPS and the subscales of ACME, KOPS had positive moderate correlations with "Cognitive Empathy" **[$r_{(325)} =0.216; p<0.05$]**, "Affective Resonance" [**$r_{(325)} = 0.307; p<0.05$**], and "Affective Dissonance" subscales [**$r_{(325)} = 0.317; p<0.05$**].

Discussion

In this study, the mean score of KOPS was determined as 127.30±15.070. It can be asserted that students' attitudes toward the elderly are also at a high level. The reason for this positive attitude is related to the traditional values of our society (Ünalan et al., 2012). It has been stated that the attitudes of nurses toward old individuals are affected by the values and culture of the society they live in. Cultural and social changes that have occurred all over the world since the beginning of the 2000s have indicated that there is a negative trend in the attitudes of nurses and student nurses toward elderly individuals (Liu et al., 2013). Upon the increase in women's

participation in business life in Turkish society especially in recent years, the decrease in extended families, and the increase in nuclear families, people's attitudes toward elderly individuals has changed negatively. However, in Turkish society, special respect is given to the old people, their opinions are attached importance, and people see them as a kind of guide because of their experience with advancing age. For this reason, many people take care of an old family member and do not leave him until his death. The different studies on this subject have reported that the attitudes of nursing students toward old people are positive (Çelik et al., 2010, Ünalan et al., 2012, Liu et al., 2013).

In this study, it was found that the mean scores of male and female nursing students toward the old people were close to each other. There was no statistically significant difference in the total mean score of KOPS according to the gender of the students ($p>0.05$). Similar studies have found the same result as the present study (Lambrinou et al., 2009, Altay et al., 2015, Söderhamn et al., 2001,Türgay et al., 2015).

In this study, no statistically significant difference was found in the total mean score of KOPS according to the class levels of the students ($p>0.05$). Likewise, in their studies Salman et al., 2018; Hweidi and Al Obeisat 2006, Alkaya and Okuyan 2017, Dinçer et al., 2016, determined that although the students showed a positive attitude toward the old people with increasing class level, they could not find a statistically significant difference.

In this study, no statistically significant difference was found in the students' total mean score of KOPS according to their residence place ($p>0.05$). Likewise, Sarı et al., 2018, stated that residence place of the students did not affect their attitudes toward old people.

In this study, no statistically significant difference was found in the total mean score of KOPS according to the family income status of the students ($p>0.05$). Accordingly, it can be said that there

was a negative trend in the attitude toward old people as the income level increases.

In this study, no significant difference was found in the students' total mean score of KOPS according to their number of siblings ($p>0.05$). Similarly, Çilingir et al., (2017) also stated in their study that the number of siblings did not affect the attitude toward old people.

In this study, no statistically significant difference was found in the students' total mean score of KOPS according to the education level of the parents ($p>0.05$). When examining the education level of the fathers of the students, it was determined that 112 were primary school graduates and 106 were secondary school graduates. When the education level of mothers was examined, it was remarkable that 121 of them were illiterate and 99 were primary school graduates. According to Akbal's (2018) study, it was observed that as the education level of mothers increased, the attitude toward old people decreased, and as the education level of the mother decreased, there was an increase in the attitude toward old people. This was stated to be associated with the fact that mothers with higher education levels participated more in working life and spent less time with their elderly family members.

In this study, no statistically significant difference was found in the total mean score of KOPS according to the employment status of the fathers and mothers of the students ($p>0.05$). In Akbal's (2018) study, it was stated that the attitudes of the students with working fathers toward old people were more positive. In the same study, students with working mothers had lower attitudes toward old people. The number of students with working fathers (208) was higher. The students with unemployed mothers were more (295).

In this study, no statistically significant difference was found in students' total mean score of KOPS according to the status of having a relative over the age of 65 years ($p>0.05$). The majority of the students (258) had relatives aged 65 and over. Upon the effect of technological developments in health care and treatment

opportunities, the elderly population is increasing all over the world (Vefikuluçay and Terzioğlu 2011; Yılmaz and Özkan 2010). As a result of numerous studies, it is estimated that the ratio of elderly individuals, which was 12% in the total population in 2013, will increase to 15% in the total population in 2050 (Dedeli et al., 2013). According to these data, the number of old people is increasing every passing day along with the developing technology and it can be predicted that there would be an increase in the number of those having relatives aged 65 and over.

In this study, no statistically significant difference was found in the students' total mean score of KOPS according to the status of living with an old family member ($p>0.05$). Yılmaz and Özkan (2010) and Çilingir et al., (2010) determined that the attitudes of students who did not live with older individuals were more positive.

In this study, it was determined that there was a statistically significant difference in the total mean score of ACME and in the mean scores of "Cognitive Empathy", "Affective Resonance" and "Affective Dissonance" subscales, according to the gender of the students **($p<0.05$).** This statistically significant difference in the total mean score of the scale and in all three subscales indicated that female students exhibited more empathetic behaviors than their male counterparts. Although the results of the related studies (Baysal et al., 2019, Sağır and Özkaptan, 2016, Çaka et al., 2018) support the present study, there are studies (Arpacı and Özmen 2014) reporting that there is no significant gender-related difference in the empathy levels of nursing students toward old people. It has been determined that women exhibited more empathetic behaviors than men since women have more emotional intelligence and have social roles (Arpacı and Özmen 2014, Çaka et al., 2018).

In this study, it was determined that there was a statistically significant difference in the total mean score of ACME and the mean score of the "Cognitive Empathy" subscale according to the class level of the students (**$p<0.05$**). This difference was found to be associated with the fact that first-year students exhibited more

empathetic behaviors than students studying in other classes. When examined in the literature, there are studies reporting that as class level increases, empathic behaviors also increase (Mete and Gerçek 2005, Çınar and Cevahir 2007, Arifoğlu and Razı 2011).

In this study, it was not determined that there was a statistically significant difference between the total mean score of ACME and the mean scores of the "Cognitive Empathy" subscale and the "Affective Dissonance" subscale according to the residence place ($p>0.05$). However, a statistically significant difference was found in the "Affective Resonance" subscale according to the students' residence place (**$p<0.05$**). There was a statistically significant difference between the students residing in the village and the district and those residing in the city. The students residing in the village and the district exhibited more empathetic behaviors than those residing in the city. Considering that individuals residing in settlements such as villages and districts spend more time with older individuals and there is a more traditional lifestyle in these settlements, it is an expected result that students residing in these settlements exhibited more empathetic behaviors.

In this study, no statistical significant difference was determined in total mean score of ACME ($p>0.05$), mean score of "Affective Resonance" subscale ($p>0.05$), and mean score of "Affective Dissonance" subscale ($p>0.05$) according to the family income of the students. However, there was a statistically significant difference in the mean score of the "Cognitive Empathy" subscale according to the family income of the students (**$p<0.05$**). This difference was caused with the fact that students whose families' income was less than and equal to their expenses exhibited more empathetic behaviors toward old people than students whose income was more than their expenses. Similar results were found with the study by Çaka et al., 2018.

In this study, it was determined that there was no statistically significant difference between the students' total mean score of ACME and mean scores of "Cognitive Empathy", "Affective

Resonance", and "Affective Dissonance" subscales compared to the number of siblings (p>0.05). Çaka et al., 2018 obtained similar results.

In this study, it was determined that there was a statistically significantly difference between the total mean score of ACME and the mean scores of the "Cognitive Empathy", "Affective Resonance", and “Affective Dissonance” subscales according to the education level of the students’ fathers (p>0.05). However, a statistically significant difference was determined according to their mother's education level **(p<0.05)**. According to the data, it was determined that students whose mothers had at least a bachelor's degree in all subscales exhibited less empathetic behaviors. In addition, in the mean score of "Affective Resonance" subscale, the students whose mothers were illiterate exhibited less empathetic behaviors toward old people than the students whose mothers were literate.

In this study, there was a statistically significant difference between the total mean score of ACME and the mean scores of the "Cognitive Empathy", "Affective Resonance" and "Affective Dissonance" subscales according to the employment status of the fathers and mothers (p>0.05). However, a statistically significant difference was found in the "Affective Dissonance" subscale mean score of students whose mothers were employed (**p<0.05**). Students with unemployed mothers exhibited more empathetic behaviors than those with employed mothers.

In this study, a statistically significant difference was not found between the total mean score of the ACME and mean scores of "Affective Resonance" and "Affective Dissonance" subscales according to the status of having a relative aged 65 and over (p>0.05). However, a statistically significant difference was found in the mean score of "Cognitive Empathy" subscale according to the status of having a relative aged 65 and over (**p<0.05**). It was found that students having relatives aged 65 and over exhibited more empathetic behaviors toward old people. In the study by Çaka et al.,

2018, no difference was found in the empathic behaviors of students aged 65 and over.

In this study, no statistically significant difference was found between the total mean score of ACME and mean scores of "Cognitive Empathy" and "Affective Resonance" subscales according to the status of living with an old person ($p>0.05$). However, it was determined that there was a statistically significant difference in the mean score of "Affective Dissonance" subscale according to the status of living with an old person (**$p<0.05$**). It was determined that students who did not live with an old person exhibited more empathetic behaviors. In their study, Çaka et al., (2018) stated that there was no difference between the empathy levels of nursing students toward old people according to the status of living with an old family member at home.

The correlation between the two scales used in this study was examined. A moderately positive significant correlation was found between the total mean score of ACME and the total mean score of KOPS. When the curriculum of the faculty where this study was conducted was examined, it can be said that nursing students exhibited positive attitudes toward old people and their empathy levels were high due to the presence of courses for the elderly. As a result of this study, it was concluded that nursing students had high attitudes and empathy levels toward old people. In addition, as the students' empathy scores increased, they displayed positive attitudes toward old people. In line with these results, it is suggested to involve further content on the subjects related to old individual, old age and aging in the education curricula for nursing students, to ensure nursing students to participate more actively in the care and treatment given to old individuals, and to prepare curricula for old people while creating course contents for nursing students.

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CHAPTER II

Effect of Childhood Traumas on Tendency to Violence: Mediating Role of Gender and Attitudes towards Domestic Violence

Nevin USLU
Merve ÇAMLIBEL
Firdevs SAVİ ÇAKAR

Introduction

Traumatic events are common in childhood, and more than one-third of individuals in the general population experience a traumatic event at least once during childhood (Copeland et al, 2007). Most traumas experienced during childhood are associated with all kinds of abuse and neglect (McCoy et al., 2013) and miscellaneous negative outcomes that have important contributions to the global disease burden in adulthood (Norman et al., 2012). The World Health Organization reports that 1 billion children aged 2-17 were exposed to some kind of violence within the last year and three out of four children were regularly abused physically and/or

psychologically by their parents and carers. Besides, 1 in every 4 children aged below 5 lived with a mother who was exposed to intimate partner violence (World Health Organization, 2020).

Childhood traumas also cause risks for the development of various mental, emotional, cognitive, behavioral, and psychological health problems as well as acute and chronic physical injuries and diseases. Individuals exposed to childhood trauma experience physical problems such as asthma, chronic bronchitis, emphysema, COAH, hypertension, heart attack, diabetes, obesity, migraine, headache, psychogenic seizures, chronic pain, fibromyalgia, and chronic fatigue problems and have a shorter length of life (Cunningham et al., 2014; Kalmakis & Chandler, 2015; Huffhines et al., 2016; Dye, 2018; Bryan, 2019). The trauma experienced at an early period could cause permanent changes in brain structure and functions as well as physiological, neurochemical, and hormonal changes. Decreases are reported particularly in the prefrontal cortex, anterior cingulate cortex, hippocampus, corpus callosum, cerebellum, and amygdala volumes in the brain. On the other hand, changes are observed in three main response systems to neurobiological stress including the serotonin system, sympathetic nervous system, and hypothalamic-hypophysis adrenal (HPA) axis as well as DNA structure (Cicchetti et al., 2016, Jin et al., 2018, Tian et al., 2021; Begeman et al., 2021; Li et al., 2022). These neurophysiological changes, by causing decreases and changes in brain functions, cause some problems in psycho-social and behavioral areas in children. Children are reported to have problems with learning, memory, attention, personality, regulation of emotion and behaviors, fear, empathy, impulse control, motivation, and cognitive abilities. This condition could cause the development of depression, anxiety, attention deficit, hyperactivity disorder, eating and sleep disorders, obsessions, hurting self and others, suicide, posttraumatic stress disorder, anti-social behaviors, substance use, and gender identity disorders during childhood or adulthood (Dye, 2018; McKay et al., 2020; Ayres, 2021).

Childhood traumas are an important problem that could cause lifelong or even intergenerational effects. Understanding intergenerational transmission mechanisms of violence requires considering both direct and indirect transmission processes (Widom&Wilson, 2015; Guedes et al., 2016; Fitton et al., 2020). Although children are exposed to violence in different places and forms by different people, a great majority of them are abused within the family and by the family. They even become invisible victims of this process by directly witnessing or being exposed to violent cases within the family (Population Science Association and United Nations Population, 2013). The literature reports that the attitudes towards violence use are learned in the family and that individuals are more inclined to tolerate violent behaviors in their own relationships during adulthood when they witness or are exposed to violence within the family (Franklin&Kercher, 2012; Lansford et al., 2014; Costa et al., 2015; Sardinha & Catalán, 2018; Copp et al., 2019; Gracia et al., 2020). Besides, studies show that adolescents and adults who experience childhood trauma have a higher probability of committing violent behaviors (Milaniak &Widom, 2015; Fitton & Fazel, 2020; Craig & Zettler, 2021), yet although the relationship between childhood trauma and violence has been investigated in the literature, this relationship is complicated and unclear. Previous studies on this issue focus on the effects of childhood traumas on general antisocial behaviors, criminal offenses, and intergenerational continuity of childhood traumas. On the other hand, the majority of the studies focus on violence types such as intimate partner violence and sexual violence. Studies that focused on general violence behaviors have evaluated the outcomes of childhood traumas in adolescence and young adulthood (Denaro, Watt & Hasan, 2016; Sui et al., 2020; Coid et al., 2021). On the other hand, except for the professionals working with children and women who are susceptible to domestic violence, no studies were found to have investigated the effect of individuals' childhood traumas on their domestic violence attitudes (Yoshihama & Mills, 2003; Saunders et al., 2011; Prost et al., 2020).

The purpose of this study is to investigate the mediating role of gender and attitudes towards domestic violence in the effects of childhood traumas on the tendency to violence by seeking answers to the following research questions: 1) Does gender have a mediating role in the effects of childhood traumas on the tendency to violence? 2) Does attitudes towards domestic violence have a mediating role in the effect of childhood traumas on the tendency to violence?

Method

Study design and sampling

This study utilized a descriptive study design and was conducted in a city located in the Mediterranean Region of Turkey between the 13th of January and the 4th of May 2020. The target population of the study included adults with various socio-economic levels who lived in this city. There is a need to exclude the effects of 12 variables in the Personal Information Form which are considered to be confounding variables to determine whether the Childhood Traumas Questionnaire scores had effects on the Attitudes towards Domestic Violence Scale and Tendency to Violence Scale scores. Therefore, considering that 12 variables could affect the dependent variable, the sample size was calculated in G*Power 3.1.9.2 program for a multiple linear regression model with a fixed effect. With f^2 =0.04 effect size, type 1 error =0.05, and statistical power of 95%, the study was conducted with 327 individuals. Individuals who met the research criteria were included in the study, which included being aged 19-65, having received no chronic physical and psychiatric medical diagnosis, having a criminal history, and agreeing to participate in the study.

Data collection

Before data were collected, the participants were verbally given information about the purpose of the study, and their written consent was received. Data were collected face-to-face, and data collection took about 20-25 minutes.

Data collection tools

Data were collected through the Personal Information Form, the Childhood Traumas Questionnaire, the Tendency to Violence Scale, and the Attitudes towards Domestic Violence Scale.

***The personal information form*.** This form was composed of 10 questions about socio-demographic characteristics such as age, gender, education level, financial condition, marital status, type of family where the individual grew up, number of children in the family where the individual grew up, having a disability, etc.

***The childhood traumas questionnaire* (CTQ).** Turkish reliability and validity of the questionnaire developed by Bernstein et al. (1994) were performed by Şar et al. (2012). The easily-applied, self-report questionnaire is a measurement tool that enables the assessment of abuse and neglect experienced before the age of 20 retrospectively and quantitatively. The scale is composed of 28 items responded on a 5-point Likert scale (1- never, 2- rarely, 3- sometimes, 4-often, 5-very often) and has 5 sub-scales that include emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. While the total trauma score ranges from 5 to 125, the sub-scale scores range between 5 and 25. Higher scores indicate more exposure to childhood trauma. Scores of over 5 for sexual and physical abuse, over 7 for physical neglect and emotional abuse, over 12 for emotional neglect, and over 35 for the total score are accepted as trauma (Bernstein et al., 1994; Sar et al., 2012).

***The tendency to violence scale* (TVS).** The Tendency to Violence Scale developed by Gökağ, Bayat, and Türkçapar aims to determine individuals' tendency to aggression and violence. The scale was readapted in the study entitled "Violence in the Family and Social Sphere" by the T.R. Family Research Institute of the Prime Ministry without changing its basic structure, and its content validity was enhanced. The reliability coefficient of the scale was found 0.78-0.87. The single-factor scale was composed of 20 questions. Higher scores indicate a higher tendency to violence. According to the scores obtained from the scale, scores between 1 and 20 indicate

a "very little" tendency to violence, scores between 21 and 40 indicate "little" tendency to violence, scores between 41 and 60 indicate a "high" tendency to violence, and scores between 61 and 80 indicate a "very high" tendency to violence (T.C. Başbakanlık Aile Araştırma Kurumu, 1998).

The attitudes towards domestic violence (ATDV). The scale developed by Şahin and Dişsiz was composed of 13 items and 4 sub-scales, which included Normalizing Domestic Violence (NDV), Generalizing Domestic Violence (GDV), Making Domestic Violence Causal (MDVC), and Hiding Domestic Violence (HDV). The items in the 5-point Likert scale are coded as 1-I strongly disagree, 2-I disagree, 3-I am not sure, 4-I agree, and 5-I strongly agree. The scores to be obtained from the scale range between 13 and 65. Higher scores obtained from the scale indicate supporting domestic violence, and a decrease in the score indicates attitudes that do not support domestic violence (Sahin and Dissiz, 2009).

Ethical considerations

Before the study was conducted, ethics committee approval was obtained from the university's ethics committee (meeting number: 2020/1, decision number: 2020/2). In addition, the participants were verbally informed about the study, and their written consent was received through the Informed Consent Form.

Data analysis

Descriptive statistics were presented as (n), percentage (%), mean±standard deviation ($\bar{x} \pm sd$), and median (M), 25%-75% percentile values. The normal distribution of the data about numeric variables was tested using the Shapiro Wilk normality test. Determining the confounding factors was performed using univariate analyses between the Attitudes towards Domestic Violence Scale, the Tendency to Violence Scale, and the Childhood Traumas Questionnaire scores and variables in the Personal Information Form. The scale scores were compared using the Mann-Whitney U test for dichotomous variables and the Kruskal Kruskal-

Wallis test for more than two variables. Dunn-Bonferroni test was utilized as a multiple comparison test when the Kruskal Wallis test was found significant. The comparison of scale scores with each other was done using the Spearman correlation analysis.

Linear regression analysis was performed to determine whether childhood traumas had effects on the tendency to violence and attitudes towards domestic violence. In univariate analyses, variables with a significance level of $p<0.10$ in the comparisons done with scale scores were taken as confounding factors. Categorical variables were obtained using dummy coding in the model. The effect of the CTQ scores on the tendency to violence and attitudes towards domestic violence was investigated by correcting it according to confounding variables. Hypotheses for the linear regression analysis were controlled using normality of residuals, tolerance, and Variance Inflation Factor (VIF). Statistical significance was accepted $p<0.10$ for regression analyses and $p<0.05$ for other analyses.

Results

Socio-demographic characteristics

The study was conducted with 327 individuals. The average age of the participants was 38.2±7.1 years, 56.0% of the participants were males, 17.1% graduated from primary school, and 96.4% did not have any disability. As for the families of the participants, 81.3% were married, 88.7% lived in a nuclear family, and 36.7% had two children (Table 1).

Childhood traumas

Table 1 presents the participants' CTQ total and sub-scale scores. The participants' scale score was found 79.0 (72.0-83.0). As for the sub-scale scores, emotional abuse sub-scale score was 12.0 (10.0-13.0), physical abuse sub-scale score was 13.0 (11.0-14.0), sexual abuse sub-scale score was 12.0 (11.0-13.0), physical neglect sub-scale score was 19.0 (17.0-20.0), and emotional neglect sub-scale score was 25.0 (23.0-25.0) (Table 1).

CTQ total and sub-scale scores did not demonstrate statistically significant differences in marital status, disability, and the number of children ($p>0.05$). When the CTQ total and sub-scale scores were analyzed by gender, females were found to have higher physical abuse sub-scale scores in comparison to males ($p<0.05$). When the participants' scores were analyzed by their education level, CTQ total and sub-scale scores were found to be higher in university graduates than in others. When analyses were done by family type, only emotional neglect scores were found to demonstrate statistically significant differences between the groups. The emotional neglect score was found to be higher in nuclear families (Table 1). Finally, the Physical Abuse sub-scale and CTQ total score were found to demonstrate a statistically significant difference by income level ($p<0.05$).

Findings about tendency to violence

Table 2 demonstrates the participants' TVS scores. The total TVS scores were found 31.0 (26.0-36.0). The TVS scores were found to show no statistically significant differences between the groups according to marital status, education level, family type, number of children, and income level. However, according to a disability, disabled individuals were found to have a higher tendency to violence ($p<0.05$). Table 3 demonstrates the correlation between CTQ and TVS, which indicated a negative and weak relationship between the CTQ and TVS scores (rho= -0.118, p= 0.032).

Attitudes towards domestic violence and related findings

The participants' Attitudes towards Domestic Violence scores according to their socio-demographic characteristics are demonstrated in Table 2. While the total ADVS score was found 21.0 (17.0-27.0), NDV, GDV, MDVC and HDV sub-scale scores were found 6.0 (5.0-9.0), 4.0 (3.0-6.0), 7.0 (6.0-8.0) and 4.0 (2.0-5.0), respectively.

The total and sub-scale scores of ADVS did not demonstrate a significant difference between the groups according to marital status, family type, and disability variables ($p>0.05$). The

participants' NDV, HDV, and ADVS total scale scores were found to demonstrate significant differences between the groups according to gender ($p<0.05$). These sub-scales and ADVS total scale scores were found to be lower in females in comparison to males, and males were found to have attitudes towards supporting domestic violence more than females.

ADVS total and sub-scale scores showed statistically significant differences according to education level. University graduates were found to have lower ADVS total and sub-scale scores compared to others. MDVC, HDV sub-scale, and ADVS scores were found to differ significantly by the number of children. Analysis of the number of children showed that the participants who had three and more children had higher MDVC, HDV sub-scale and ADVS scores, and they were found to have attitudes that support domestic violence ($p<0.05$). All the sub-scales except for the MDVC sub-scale as well as ADVS scores were found to demonstrate statistically significant differences according to income level ($p<0.05$). Table 3 presents the correlation between CTQ and ADVS and sub-scales. A weak and negative relationship was detected between CTQ and ADVS and their sub-scales. A positive and moderate-level relationship was found between TVS and ADVS, NDV and HDV sub-scales, and a positive and weak relationship was found between TVS and GDV and MDVC sub-scales (Table 3).

Effect of childhood traumas on tendency to violence scale and attitudes towards domestic violence

According to Model 1, the effect of CTQ total scores on the tendency to violence was analyzed using multiple regression analysis. According to the multiple regression analysis results, the tendency to violence scores decrease as CTQ total scores increase (Table 4).

In Model 2, corrections were made between the tendency to violence scores and CTQ total scores according to the variables that were considered to be confounding, and the effect of CTQ total scores on the tendency to violence was analyzed. According to

Model 2, CTQ total scores have no significant effects on the tendency to violence (Table 4).

As is shown in Figure 1, since no corrections were done between CTQ total scores and tendency to violence, there is a statistically significant negative, and weak correlation between the two variables (r=-0.116, p=0,035). While there was a statistically significant, positive, and weak correlation between the CTQ total scores and Attitudes towards Domestic Violence scores (r=0.247, p<0.001), there was a statistically significant, positive, and weak correlation between attitudes towards domestic violence and the tendency to violence (r=-0.370, p<0.001). The relationship detected between CTQ and tendency to violence (Model 1) loses its statistical significance when the attitudes towards domestic violence variable is controlled. In this regard, the real cause of the increase in the tendency to violence seems to be attitudes towards domestic violence. This finding suggests that attitudes towards domestic violence play an important mediating role between CTQ and the tendency to violence.

Discussion

This study aimed to investigate the mediating role of gender and attitudes towards domestic violence in the effects of childhood traumas on the tendency to violence and found that there was a relationship between CTQ and tendency to violence, and attitudes towards domestic violence had an important mediating role between the CTQ and tendency to violence. Different from the findings of this study, the literature reports high risks of committing violence in adolescents and adults who experienced childhood trauma (Milaniak & Widom, 2015; Fitton & Fazel, 2020; Craig & Zettler, 2021). The World Health Organization reported that individuals who were exposed to childhood trauma four times or more during childhood were seven times more at risk of being involved in interpersonal violence as a victim or perpetrator (World Health Organization, 2020). Different findings of this study from the related literature could be caused by different methodologies of the studies in the

literature, different geographical regions and times, adolescents and adults of different ages and genders, different definitions of maltreatment of children, and different analysis methods.

On the other hand, in the mediation test conducted, having positive attitudes towards domestic violence was found to be the real cause of the increase in the tendency to violence in adults who had been exposed to childhood trauma. This finding indicates that adults who have been exposed to childhood trauma and who have negative attitudes towards violence could have decreased tendency to violence. Although the literature includes studies indicating that childhood trauma increased the probability of being involved in violence in adulthood, some other studies demonstrated that these children could be against domestic violence in adulthood with the empathy they developed (Yoshihama & Mills, 2003; Saunders et al., 2011; Prost et al., 2020). Studies conducted with professionals working with women and children reported that individuals who witness violence and who experience personal victimization tend to have a higher probability of responding to and supporting domestic violence and intimate partner victims in comparison to others (Yoshihama & Mills, 2003; Saunders et al., 2011; Prost et al., 2020).

This study found that individuals with high childhood traumas had negative attitudes towards violence and had a decrease in their tendency to violence. This finding could be considered to be associated with post-traumatic growth/development experienced as another effect of childhood traumas. An analysis of the related literature indicates that around two-thirds of individuals who encountered a traumatic event had positive changes; that although traumatic experiences caused many problems, these problems could be considered as an opportunity for personal development; and that individuals reached a better functionality level in comparison to pre-traumatic experience period (Tedeschi& Calhoun, 2004; Bayraktar, 2012). In this regard, this finding is considered to be in line with the literature, and it seems to explain the negative attitudes of adult individuals who experienced childhood trauma. Future studies could

investigate the mediating role of post-traumatic recovery in the effect of childhood trauma on the tendency to violence.

Another finding of this study is that childhood traumas did not demonstrate differences according to gender in the total score, yet in the physical abuse dimension, women were reported to be exposed to more physical abuse than men in the childhood period. This finding could be associated with higher exposure of women to physical violence and the patriarchal structure of Turkish society as well as social acceptance that normalizes violence and supports gender inequality through sayings such as "Spare the rod and spoil the child", "Beating came from heaven", "Roses sprout up in the place where mothers/teachers/fathers beat", causing to see physical violence as a discipline tool in raising children (Arslan et al., 2011; Bedel and Güler, 2020). On the other hand, the literature has documented that women are exposed to childhood traumas more than men (Metzler et al., 2017; Merrick et al., 2018; Winstanley et al. 2020; Smith et al., 2021) and they are exposed to more emotional and sexual abuse in their childhood (Merrick et al., 2018; Curran et al., 2018; Winstanley et al. 2020; Fitton, Yu, & Fazel, 2020; Haahr-Pedersen et al., 2021).

This study also found that men tended to have attitudes towards normalizing and hiding domestic violence and supporting domestic violence. In this regard, men's attitudes towards violence as a factor increasing domestic violence are considered important, indicating that this case has the potential to contribute to committing physical violence to their spouse/partners and children and transmitting violence from generation to generation. Besides, gender roles of men representing them as strong and aggressive in a patriarchal society also bring gender inequality (Global Gender Gap Report, 2021), which is considered to be a factor that continues to make men become perpetrators of both childhood traumas and domestic violence. A study in the literature reported that a one-unit increase in accepting the use of violence in relationships increases the probability of committing physical violence in relationships 2.85 times more (Franklin& Kercher, 2012). In this regard, the evidence

level could be increased by developing intervention programs, particularly for perpetrators, for the prevention of domestic violence.

Another important finding of this study is the family structure that has a special meaning in Turkish society. Emotional abuse scores were found to be higher in nuclear families. According to the Turkish Statistical Institute Family Statistics (2020), while the proportion of nuclear families was 65.2%, that of extended families was 14.0% in Turkey in the year 2020. Each year, there is a decrease in the proportion of extended families and nuclear families in Turkey, and the number of single-parent families has been increasing (9.7%) (Turkish Statistical Institute Family Statistics, 2020). Although discussions on the advantages and disadvantages of nuclear families still continue in the literature, the effect of family structure on childhood traumas, particularly emotional neglect is not clear yet. A study conducted by Uslu et al. in Turkey reported that the probability of families noticing the emotional abuse of their children decreased as the family size increased (Uslu, Kapci, Yildirim & Oney, 2010). A study conducted in the United States of America reported that the ratios of child neglect were higher in extended families (Brown, Cohen, Johnson & Salzinger, 1998). A study conducted in India reported that the family structure had no effects on emotional neglect (Charak & Koot, 2014).

Although abuse and neglect in childhood are associated with various factors, the literature reports that the probability of exposure to abuse and neglect increased with the increase in the number of children (World Health Organization, 2002; Logan-Greene & Semanchin Jones, 2018). Various studies conducted in Turkey in recent years report that abuse and neglect are higher in families with one or two children (Karasu & Bilgen, 2017; Çalışkan et al., 2019). This study found that the number of children in families where children grew up did not affect childhood traumas.

Childhood trauma is a phenomenon that affects a child's whole life. Trauma could have negative effects on the child’s cognitive functions, planning, and problem-solving and could cause

consequences such as attention attention deficit, impulsivity, low social competence, and low emotional intelligence. All of these are associated with intellectual and academic consequences such as low education level (Hardaway et al., 2014; Romano et al., 2015; Clouston et al., 2015; Stikkelbroek et al., 2016). Individuals with low education levels are more likely to encounter stressors such as unemployment, economic difficulties, and low-paid and non-prestigious occupations (Clouston et al., 2015; Sheikh, 2018). However, different from the literature, a notable finding of this study is that individuals who had a university education and those who had high-income levels were exposed to childhood traumas more than others who did not have these characteristics. This finding could be associated with higher knowledge and awareness of individuals with higher education and income level about childhood traumas.

Limitations

Although this study was conducted with healthy individuals, it was surprising to see that the majority of the individuals who are considered healthy had been exposed to more than one type of childhood trauma. These results indicate the importance of screenings for childhood traumas. On the other hand, this study has some limitations. One of the limitations is that since the study sample was selected from a healthy population, no comparisons of the results were made with a patient population who had medical diagnoses. Besides, the majority of the participants had high education and income levels; therefore, particularly illiterate groups could not be compared with others with other education levels. Another limitation of the study is that in the data collection process, the participants were not asked if they had received any education, consultancy, diagnosis, psychotherapy or treatment services about childhood traumas. Studies to be conducted in the future could consider this. The study did not evaluate the effect of childhood traumas on the tendency to violence according to the type of childhood traumas, which is considered to be another limitation.

Conclusion

This study, which investigated the effect of childhood traumas on the tendency to violence, showed that gender did not have a mediating role in the tendency to violence. However, women were found to support domestic violence less than men and their attitudes towards hiding violence indicate their awareness about seeing violence as unacceptable. Another important point of this study is that attitudes towards domestic violence have a mediating role between childhood traumas and the tendency to violence. An important way of coping with childhood traumas and domestic violence is sharing it with others and reporting it without hiding it. Therefore, professionals working with children should be aware of this condition experienced especially by female children and develop awareness-raising programs so that they would not internalize it and learn the channels where they can receive help. Breaking the violence cycle in the future and changing individuals' attitudes towards domestic violence could be possible by teaching children and adolescents that violence should not be a deserved behavior, receiving help is very important in case of exposure to violence, and establishing a rights-based communication system is the right thing. Professionals could have a role in and defend the development of laws and policies that maintain all these.

Implications for Practice

Childhood trauma is a fundamental neglect of children's rights. Therefore, preventing it and supporting children who experience it is a moral duty. Childhood trauma is also an important preventable risk factor for psychopathology. When the increasing evidence in recent years is taken into consideration, experts need strategies to decrease the harmful effects of childhood traumas and encourage endurance in children and families. Trauma-informed care provides a regulatory principle that increases the awareness of trauma-related symptoms for pediatric practice, supports an emotionally safe care environment, and provides special interventions to decrease the effects of exposure to trauma (Bartlett

& Smith, 2019; Duffee et al., 2021). Today, trauma-informed and trauma-sensitive approaches have gained importance at schools in terms of accessing more people (Chafouleaset al., 2016; Dorsey et al., 2017; Chafouleaset al., 2019). Prevention and early intervention programs could be developed within the framework of this approach. The amount of evidence for the effects of these prevention and intervention programs could be increased.

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Disclosure statement

The authors report there are no competing interests to declare.

Table 1. Individuals' Childhood Traumas Questionnaire Sub-Scale And Total Scores According To Their Socio-Demographic Characteristics

	n (%)	Emotional Abuse	Physical Abuse	Sexual Abuse	Physical Neglect	Emotional Neglect	Total
		M(25p-75p)	*M(25p-75p)*	*M(25p-75p)*	*M(25p-75p)*	*M(25p-75p)*	*M(25p-75p)*
Gender							
Female	144 (44.0)	12.0 (10.0-13.0)	13.0 (11.0-15.0)	12.0 (11.0-13.0)	19.0 (17.0-20.75)	25.0 (23.0-25.0)	80.0 (73.0-84.75)
Male	183 (56.0)	12.0 (11.0-13.0)	13.0 (11.0-14.0)	12.0 (11.0-13.0)	19.0 (16.0-20.0)	25.0 (23.0-25.0)	78.0 (72.0-82.0)
p*		0.389	0.029	0.510	0.632	0.452	0.252
Marital Status							
Married	266 (81.3)	12.0 (10.75-13.0)	13.0 (11.0-14.0)	12.0 (11.0-13.0)	19.0 (17.0-20.0)	25.0 (23.0-25.0)	78.0 (72.0-83.0)
Single	61 (18.7)	12.0 (10.0-13.0)	13.0 (11.0-15.0)	12.0 (11.0-13.0)	19.0 (16.0-21.0)	25.0 (22.0-25.0)	80.0 (73.5-85.0)
p*		0.923	0.099	0.423	0.569	0.919	0.313
Education Level							
Primary School	56 (17.1)	11.0 (9.0-13.0)^{a}	11.0 (10.0-13.0)^{a}	11.0 (9.0-12.0)^{a}	17.0 (14.25-19.0)^{a}	23.5 (21.0-25.0)^{a}	73.0 (66.0-79.0)^{a}
High School	85 (26.0)	12.0 (10.0-13.0)^{ab}	12.5 (10.0-14.0)^{b}	12.0 (10.0-13.0)^{b}	18.0 (16.0-20.0)^{ab}	25.0 (23.0-25.0)^{ab}	76.0 (70.0-83.0)^{b}
University	186 (56.9)	12.0 (11.0-13.0)^{b}	13.0 (12.0-15.0)^{c}	12.0 (11.0-13.0)^{b}	19.0 (17.0-21.0)^{b}	25.0 (23.0-25.0)^{b}	81.0 (75.75-85.0)^{c}
p*		0.026	<0.001	0.001	<0.001	0.038	<0.001
Family Type							
Nuclear	290 (88.7)	12.0 (10.0-13.0)	13.0 (11.0-14.0)	12.0 (11.0-13.0)	19.0 (17.0-20.0)	25.0 (23.0-25.0)	79.0 (73.0-83.0)
Extended	37 (11.3)	12.0 (11.0-13.0)	13.0 (10.0-14.0)	13.0 (11.0-13.0)	18.0 (16.0-20.0)	23.0 (20.0-25.0)	77.0 (68.0-81.0)
p*		0.658	0.300	0.220	0.322	0.003	0.143
Income level (TL)							
2000 and below	5 (1.5)	10.0 (7.0-13.0)	13.0 (8.0-13.0)^{a}	11.0 (5.5-13.0)^{ab}	18.0 (15.0-19.5)^{ab}	25.0 (21.0-25.0)	77.0 (59.5-80.5)^{ab}
2001-4000	155 (47.4)	12.0 (10.0-13.0)	12.0 (10.0-14.0)^{b}	10.5 (10.0-13.0)^{a}	17.5 (16.0-20.0)^{a}	25.0 (23.0-25.0)	76.0 (70.0-81.0)^{a}
4001-6000	77 (23.5)	12.0 (10.0-13.0)	13.0 (12.0-15.0)^{a}	11.0 (10.0-13.0)^{ab}	19.0 (16.5-21.0)^{ab}	25.0 (23.5-25.0)	80.0 (74.0-84.5)^{ab}
6001-8000	58 (17.8)	12.0 (11.0-13.0)	13.0 (12.0-15.0)^{a}	12.0 (11.0-13.0)^{ab}	19.0 (16.75-20.0)^{ab}	24.5 (21.0-25.0)	79.0 (73.0-85.0)^{ab}
8001-10000	22 (6.8)	13.0 (11.75-13.0)	13.0 (11.0-16.0)^{a}	12.0 (12.0-13.0)^{ab}	19.5 (18.75-21.0)^{ab}	25.0 (24.75-25.0)	81.5 (77.5-85.25)^{b}
10000 and over	10 (3.0)	13.0 (12.75-13.0)	13.0 (13.0-17.0)^{a}	13.0 (12.0-13.0)^{b}	21.0 (19.75-21.0)^{b}	25.0 (24.0-25.0)	86.0 (81.75-88.25)^{b}
p*		0.118	0.001	0.006	0.002	0.085	<0.001

Number of Children							
None	68 (20.8)	12.5 (11.0-13.0)	13.0 (12.0-15.0)	12.0 (11.0-13.0)	19.0 (16.25-20.0)	25.0 (23.0-25.0)	80.0 (74.0-85.0)
1	115 (35.2)	12.0 (11.0-13.0)	13.0 (11.0-14.0)	12.0 (11.0-13.0)	19.0 (16.0-20.0)	25.0 (23.0-25.0)	78.0 (73.0-82.0)
2	120 (36.7)	12.0 (10.0-13.0)	13.0 (11.0-14.0)	12.0 (10.25-13.0)	18.0 (16.25-21.0)	25.0 (22.0-25.0)	78.0 (69.25-83.0)
3 and more	24 (7.3)	12.0 (9.0-13.0)	13.0 (11.0-13.75)	11.5 (11.0-13.0)	19.0 (17.0-20.75)	23.5 (21.25-25.0)	79.0 (72.0-82.0)
p**		0.366	0.148	0.684	0.652	0.365	0.380
Disability							
Yes	10 (3.1)	11.5 (8.0-13.0)	12.5 (10.0-13.25)	11.0 (9.0-13.0)	19.0 (15.75-20.25)	25.0 (22.0-25.0)	75.0 (68.5-81.25)
No	317(96.9)	12.0 (10.5-13.0)	13.0 (11.0-14.0)	12.0 (11.0-13.0)	19.0 (17.0-20.0)	25.0 (23.0-25.0)	79.0 (72.0-83.0)
p*	0.328	0.474	0.742	0.974	0.668	0.391	
TOTAL	327 (100.0)	12.0 (10.0-13.0)	13.0 (11.0-14.0)	12.0 (11.0-13.0)	19.0 (17.0-20.0)	25.0 (23.0-25.0)	79.0 (72.0-83.0)

***** Mann-Whitney U test ** Kruskal-Wallis test a, b and c indicate groups that have differences.

Table 2. Individuals' Tendency to Violence and Attitudes Towards Domestic Violence Scores According to Their Socio-Demographic Characteristics

	TVS	**NDV Sub-scale**	**GDV Sub-scale**	**MDVC Sub-scale**	**HDV Sub-scale**	**ADVS**
	M(25p-75p)	*M(25p-75p)*	*M(25p-75p)*	*M(25p-75p)*	*M(25p-75p)*	*M(25p-75p)*
Gender						
Female	30.0 (25.0-36.0)	6.0 (5.0-8.75)	3.0 (3.0-6.0)	7.0 (5.0-8.0)	3.0 (2.0-4.0)	20.0 (16.0-25.0)
Male	31.0 (26.0-36.0)	7.0 (5.0-10.0)	4.0 (3.0-6.0)	7.0 (6.0-8.0)	4.0 (2.0-6.0)	23.0 (18.0-28.0)
p*	0.216	0.009	0.160	0.229	0.001	0.005
Marital Status						
Married	30.0 (26.0-35.25)	6.0 (5.0-9.0)	4.0 (3.0-6.0)	7.0(5.0-8.0)	4.0 (2.0-5.0)	21.0 (17.0-27.0)
Single	31.0 (25.0-38.0)	6.0 (5.0-9.0)	3.0 (3.0-6.0)	7.0 (6.0-8.0)	3.0 (2.0-4.0)	21.0 (17.0-28.0)
p*	0.360	0.772	0.876	0.348	0.294	0.708
Education Level						
Primary School	30.0 (25.25-37.75)	7.0 (5.0-11.0)^{a}	4.5 (3.0-6.75)^{a}	7.0 (6.0-9.0)^{a}	4.0 (2.25-6.0)^{a}	25.0 (18.0-31.0)^{a}
High school	31.0 (25.5-38.0)	7.0 (5.0-10.0)^{a}	5.0 (3.0-6.5)^{a}	7.0 (6.0-9.0)^{a}	4.0 (2.0-6.0)^{a}	23.0 (19.0-30.0)^{a}
University	31.0 (26.0-35.25)	6.0 (5.0-8.0)^{b}	3.0 (3.0-5.0)^{b}	7.0 (5.0-8.0)^{b}	3.0 (2.0-4.0)^{b}	20.0 (16.0-24.0)^{b}
p**	0.891	0.001	0.001	0.008	<0.001	<0.001
Family Type						
Nuclear	31.0 (26.0-36.0)	6.0 (5.0-9.0)	4.0 (3.0-6.0)	7.0 (6.0-8.0)	4.0 (2.0-5.0)	21.0. (17.0-27.0)

Extended	30.0 (25.5-39.0)	6.0 (5.0-10.0)	4.0 (3.0-6.0)	7.0 (4.5-8.5)	4.0 (2.0-6.5)	23.0 (16.0-30.5)
p*	0.767	0.833	0.351	0.823	0.072	0.439
Income Level (TL)						
2000 and below	30.0 (23.0-38.5)	5.0 (5.0-11.5) [ab]	3.0 (3.0-3.5) [ab]	7.0 (3.0-9.5)	2.0 (2.0-4.0) [ab]	18.0 (13.0-28.0) [ab]
2001-4000	30.0 (25.0-37.0)	7.0 (5.0-10.0) [a]	5.0 (3.0-6.0) [a]	7.0 (6.0-9.0)	4.0 (2.0-6.0) [a]	24.0 (18.0-29.0) [a]
4001-6000	31.0 (26.0-35.5)	6.0 (5.0-9.0) [ab]	3.0 (3.0-6.0) [ab]	7.0 (6.0-8.0)	3.0 (2.0-5.0) [ab]	20.0 (17.0-27.5) [b]
6001-8000	32.0 (27.75-36.0)	5.0 (5.0-8.0) [ab]	4.0 (3.0-5.0) [ab]	7.0 (5.0-7.0)	3.0 (2.0-4.0) [ab]	20.0 (16.0-24.0) [b]
8001-10000	30.0 (24.0-33.5)	5.0 (5.0-7.5) [a]	3.0 (3.0-4.5) [ab]	6.0 (4.5-7.0)	2.0 (2.0-4.0) [b]	17.5 (15.75-24.0) [b]
10000 and over	27.0 (23.75-38.25)	5.5 (5.0-8.25) [ab]	3.0 (3.0-3.0) [b]	7.0 (4.0-7.25)	2.0 (2.0-3.0) [b]	17.0 (15.75-21.0) [b]
p	0.646	0.027	<0.001	0.187	0.001	0.004
Number of Children						
None	30.0 (26.0-35.7)	6.0 (5.0-8.0)	3.0 (3.0-5.75)	7.0 (6.0-8.0) [a]	3.0 (2.0-4.0) [a]	20.0 (17.0-24.0) [a]
1	30.0 (26.0-35.0)	6.0 (5.0-9.0)	4.0 (3.0-6.0)	7.0 (4.0-8.0) [a]	4.0 (2.0-5.0) [a]	20.0 (16.0-26.0) [a]
2	31.5 (26.0-37.0)	6.0 (5.0-10.0)	4.0 (3.0-6.0)	7.0 (5.25-9.0) [ab]	4.0 (2.0-5.75) [a]	22.5 (17.0-28.0) [ab]
3 and more	30.0 (25.25-34.5)	7.5 (6.0-11.75)	5.0 (3.0-6.75)	8.5 (6.0-10.0) [b]	6.0 (3.25-7.0) [b]	26.5 (19.25-34.75) [b]
p	0.391	0.097	0.087	0.014	0.004	0.006
Disability						
Yes	38.0 (33.75-44.25)	8.5 (5.75-11.25)	3.0 (3.0-7.0)	7.0 (4.75-9.25)	4.0 (3.5-5.25)	25.0 (17.25-30.0)
No	30.0 (26.0-36.0)	6.0 (5.0-9.0)	4.0 (3.0-6.0)	7.0 (6.0-8.0)	4.0 (2.0-5.0)	21.0 (17.0-27.0)
p*	0.001	0.137	0.576	0.792	0.285	0.407
TOTAL	31.0 (26.0-36.0)	6.0 (5.0-9.0)	4.0 (3.0-6.0)	7.0 (6.0-8.0)	4.0 (2.0-5.0)	21.0 (17.0-27.0)

*****Mann-Whitney U test ** Kruskal-Wallis test a, b indicate groups that have differences

*Table 3. Relationship Between Childhood Traumas Questionnaire and Tendency To Violence Scale and Attitudes Towards Domestic Violence **

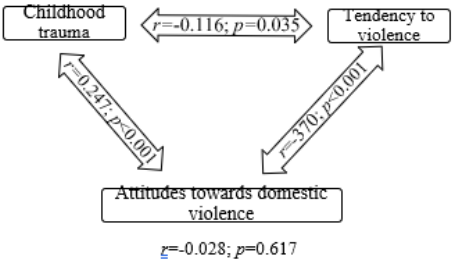
	CTQ	**TVS**	**NDV Sub-scale**	**GDV Sub-scale**	**MDVC Sub-scale**	**HDV Sub-scale**	**ADVS**
CTQ	-						
TVS	*rho*=-0.118 *p*=0.032	-					
NDV Sub-scale	*rho*=-0.248 *p*<0.001	*rho*=0.431 *p*<0.001	-				
NDV Sub-scale	*rho*=-0.236 *p*<0.001	*rho*=0.295 *p*<0.001	*rho*=0.678 *p*<0.001	-			
NDV Sub-scale	*rho*=-0.131 *p*=0.018	*rho*=0.248 *p*<0.001	*rho*=0.481 *p*<0.001	*rho*=0.500 *p*<0.001	-		
NDV Sub-scale	*rho*=-0.274 *p*<0.001	*rho*=0.304 *p*<0.001	*rho*=0.594 *p*<0.001	*rho*=0.629 *p*<0.001	*rho*=0.522 *p*<0.001	-	
NDV Sub-scale	*rho*=-0.243 *p*<0.001	*rho*=0.395 *p*<0.001	*rho*=0.840 *p*<0.001	*rho*=0.807 *p*<0.001	*rho*=0.783 *p*<0.001	*rho*=0.806 *p*<0.001	-

*Spearman correlation test

Table 4. Effect of the CTQ Total Score on Tendency to Violence

Model 1: Effect of the CTQ total score on Tendency to Violence (unadjusted)							
	Regression Coefficients					**Multiple Linear Regression Statistics**	
	β	*se*	*zβ*	*t*	*p*	*Tolerance*	*VIF*
Tendency to Violence							
Fixed	38.939	3.584		10.865	<0.001		
CTQ Total Score	-0.098	0.046	-0.116	-2.112	0.035	1.000	1.000
Model Summary: F=4.462; p=0.035; R^2=0.014; *Adj* R^2=0.011, Partial η^2 for CTQ =0.014, power for CTQ =0.558							
Model 2: Effect of the CTQ total score on Tendency to Violence (adjusted)							
	Regression Coefficients					**Multiple Linear Regression Statistics**	
	β	*se*	*zβ*	*t*	*p*	*Tolerance*	*VIF*
Tendency to Violence							
Fixed	50.229	4.798		13.226	<0.001		
CTQ Total Score	-0.034	0.046	-0.041	-0.753	0.452	0.868	1.152
Adjusted for Education Level, Disability, Attitudes towards Domestic Violence Model Summary: F=13.694; p<0.001; R^2=0.176; *Adj* R^2=0.163, Partial η^2 for CTQ =0.002, power for CTQ =0.110							

Figure 1. *Correlations Between the Variables*



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CHAPTER III

Gaming Addiction in Adolescents Via Perspective of Child Health

Aslı AKDENİZ KUDUBEŞ[1]

Introduction

Adolescents are the group that uses digital technology the most and is also the most sensitive group affected by digital technology. Today, computers and the internet, which provide convenience in many areas of life, are also rapidly spreading for gaming and entertainment purposes (Thunberg & Arnell, 2022).With urbanization, green playgrounds have decreased and outdoor games have been replaced by digital media games. As a result, young people who follow technology closely have become more attached to games. The term gaming addiction has emerged as

[1] Assoc. Dr., Bilecik Şeyh Edebali University, Faculty of Health Sciences, Department of Nursing, Department of Child Health and Diseases Nursing

a result of excessive and uncontrolled gaming use (Cabeza-Ramírez et al., 2021).

Digital games are games that create a visual environment for players who participate in the game through electronic platforms such as desktops, laptops, game consoles, phones and tablets, by user login (Lérida-Ayala et al., 2023). Digital games started via computers; With the developing technology, it seems that game consoles that were first connected to televisions have extended to personal smartphones. Digital games; As online or offline games, they can also be classified as adventure, action, sports, strategy, simulation, role playing, puzzle, tactics, depending on the preferences of the players (Lérida-Ayala et al., 2023).

Game Addiction

For digital game addiction; different terminological concepts such as “excessive gaming”, “obsessive gaming”, “digital gaming addiction”, “pathological gaming behaviors”, “problematic gaming behaviors” are used. The stages of this process, which is also defined as the individual's inability to stop playing a digital game for a long time, thus disrupting his duties and responsibilities, include salience, mood changes, tolerance, withdrawal symptoms, conflict, and relapse (Kuss, 2013).

Game addiction is a condition defined as individuals' inability to stop playing games for a long time, associating the game with their real lives, neglecting their responsibilities due to the game, and preferring the game to other activities (Kuss, 2013). Lemmens et al. (2009) defined game addiction as "the person's excessive and compulsive use of computer or video games, even though it causes social and/or emotional problems, and the player is unable to control the excessive use." Studies show that especially adolescents between the ages of 10 and 19 have a higher tendency to play excessive games and use problematic games than other age groups (Lemmens et al., 2009).

It is stated that children who do not have a healthy and safe family environment see digital games as an escape, and behavioral addiction occurs due to reasons such as the feeling of superiority they get when they can win the race and being successful in the game, and these children are the group that suffers the most from the digital game industry (D. Griffiths et al., 2012). Adolescents learn to be happy with the pleasure and sense of superiority they gain through playing and close themselves off to different ways of being happy. During this period, children who leave home under the excuse of going to school spend time in internet cafes. Relationships with family and friends in real life deteriorate, interest in social activities decreases, spends most of the time playing games, spends the time not playing games thinking about playing, loses sleep at night due to time spent playing games, decreases in academic success, spends time spent playing games. It is stated that attention should be paid to children who begin to feel the need to lie about themselves (Kuss & Griffiths, 2012).

Digital games, which continue to be an integral part of societies and cultures, have serious economic, social and cultural impacts. All individuals who play games may face game addiction in the normal course of time. However, prevalence is more common in male adolescents. Unlike other media, computer games have a communication aspect, enable people to realize their dreams that they cannot realize in real life, and give them the feeling of winning and success, causing adolescents to be more interested in games (D. Griffiths et al., 2012; Kuss & Griffiths, 2012).

In the data of the Turkish Statistical Institute (TUIK) Household Information Technologies Usage Survey; It is stated that the proportion of households with access to the internet from home in 2023 will increase by 1.4 points compared to the previous year, reaching 95.5% (Türkiye İstatistik Kurumu (TÜİK), 2023). According to the 2021 data of the Information Technologies Usage Research in Children, the child declares that at least one of the computer (desktop/laptop/tablet), mobile phone/smart phone, TV/smart TV, smart watch and game console technology products is

for his/her own use only. The rate of children in the 6-15 age group who were 66.6% in 2021. 94.7% of children in the 6-15 age group who stated that they play digital games declared that they play digital games regularly, almost every day or at least once a week (Türkiye İstatistik Kurumu (TÜİK), 2021). In the same report, it was seen that the rate of boys and girls in the 6-15 age group who stated that they played digital games regularly was 96.2% and 91.8%. Boys, who stated that they play digital games regularly, stated that they play digital games for an average of 3 hours and 2 minutes on weekdays, girls for 2 hours and 18 minutes, and boys for 2 hours and 59 minutes, and girls for 2 hours and 11 minutes on weekends. As a result of these data, it is seen that internet and game addiction is a serious child health problem in our country (Türkiye İstatistik Kurumu (TÜİK), 2021).

Although the number of scientific articles on game addiction in Turkey is limited, no epidemiological data showing the seriousness of the situation has been found(Çakır & Turan, 2021; Caner & Evgin, 2021; Kurt et al., 2018). Although there is no prevalence indicator at the national level, Irmak's (2019) study on 865 adolescents found the rate of addicted gamers to be 28.8% (Irmak & Erdoğan, 2019). In the study conducted by Karaca et al. in 2020 with 1019 students, it was determined that 46.7% of the students were problem users and 5.6% were computer game addicts (Karaca et al., 2020)These rates emphasize the importance of combating gaming addiction in adolescents.

Positive Effects of Digital Games on Adolescents

It is known that digital games affect the psychological, social and physical health of adolescents in many ways. Adolescents find it easier to have intimate relationships with others in an imaginary game world than to communicate face to face. Thus, interactions in the game may represent a way of coping with real interpersonal problems. On the other hand, well-established gaming skills can be used by adolescents to gain respect and have a reputation among

other players. Thus, they fulfill their self-actualization needs (Adachi & Willoughby, 2012; Sublette & Mullan, 2012).

It is normal to play games as a part of a healthy life, and these games even provide emotional release/relaxation, increase in problem-solving skills and game-based learning, use of free time, get rid of stress, improve behaviors such as cooperation and sharing, improve eye-hand coordination and visual acuity. It has been shown that it has positive effects such as increasing spatial skills and. Computer games are very effective in acquiring computer literacy. In addition to literacy, games also have benefits such as improving spatial abilities, imagination, explaining the reasons for shapes, visualizing objects related to chemistry and physics, and ensuring the integration of shapes in space (Adachi & Willoughby, 2012; Sublette & Mullan, 2012).

Another area where computer games have an impact on students is their circle of friends. It is stated that individuals' playing games with their circle of friends has an important role in the development of their social relations, communication and language skills, and in their ability to express themselves and acquire the phenomenon of sharing (Seo et al., 2012). Virtual friendships have also increased as a result of communicating with hundreds of people in these games. In the literature, games have been found to be effective in learning a new language. It has also been found that playing games increases imagination. It has been determined that some games have positive effects on mental deveLopment, stimulate mental processes, increase concentration and help cope with stress. In addition, computer games are used to control aspects of hyperactive behavior, such as hastiness and impatience, and to maintain control patiently. There are computer games created to teach children with asthma and diabetes the necessary skills to take care of themselves (Adachi & Willoughby, 2012; Sublette & Mullan, 2012).

Negative Effects of Gaming Addiction on Adolescents' Health

Physical Effects

It has been determined that excessive playing of certain types of video games can cause negative health problems such as epileptic seizures, blood circulation and heart diseases. Computer games; Learning disorders, decrease in academic success, not doing homework, lying about playing games, poor interpersonal relationships, etc. It was emphasized that there were negative reasons. Adolescents who constantly play games may experience deformities in the appearance of hands, shoulders, and spine due to decreased activity, psychomotor skill disorders, headaches, dry eyes, being constantly tired and sleepy, weight and vision loss, and problems resulting from not paying attention to personal hygiene(Aziz et al., 2021; Coyne et al., 2015; Männikkö et al., 2015).

As with all kinds of addictions, game addiction poses a risk for healthy lifestyle behaviors. Adolescents who spend most of their time inactively playing games, avoiding all kinds of responsibilities may cause them to avoid health responsibilities and adopt negative behaviors. Early preventive studies protect adolescents against the dangerous consequences of gaming addiction. Developing healthier ways to cope with daily life stresses is effective in preventing game addiction(Aziz et al., 2021; Männikkö et al., 2015).

Psychosocial Effects

When game use turns into addiction; It has been stated that it causes low life satisfaction, aggression, violent tendencies, hostility and an increase in hyperactivity. Individuals can try to relieve their loneliness with games. As a result, aggressive behavior, personality changes, psychomotor disorders, antisocial behavior, free thinking, loss of desire/desire, harmful social relationships and communication problems, and high anxiety levels occur (Kaya et al., 2023). It is stated that individuals who spend excessive time playing computer games have a negative impact on their relationships with

their friends and that these games can replace the individual's friends. It has been revealed that excessive online gaming is significantly associated with depression, anxiety, loss of appetite, sleep disturbance, limited physical activity and aggressive behavior (Brunborg et al., 2013; Van Rooij et al., 2014).

Game addiction causes a decrease in the time spent with the family, postponement of priorities, remaining inactive, moving away from real life and getting closer to game addict candidates, and skipping responsibilities. Studies show that game addiction reduces academic success and that there is a significant negative relationship between academic success and game addiction (Brunborg et al., 2013; Van Rooij et al., 2014).

Interventions to be Implemented to Cope with Game Addiction in Adolescents

The education should be given to health professionals, teachers and parents on game addiction and problems caused by game addiction, screening criteria, preventing and combating game addiction in the early stages. In case of addiction, they should be directed to receive support and counseling. The most important element in controlling gaming use in adolescents is; These are family environments where communication is strong, mutual trust, supportive, democratic and positive parent-child relationships exist (Kaya et al., 2023). This situation reveals the importance of programs aimed at improving individuals' lifestyles. The most ideal environment for planning and carrying out these programs is schools where adolescents gather together; Pediatric nurses, who are important members of the healthcare team providing service, have a great responsibility in this regard (Purwaningsih & Nurmala, 2021).

In order for health promotion programs to be successful, students' problems must be identified early by the pediatric nurse and solutions must be sought. In this sense, the nurse is the key human force in problem solving. Pediatric nurse; It conducts regular screenings to identify problems in adolescents, prioritizes the

problems and takes initiatives in cooperation with school staff and family members to solve them. Nurses also have an important role and opportunity to identify gaming addiction, healthy and risky lifestyle behaviors in adolescents, and to identify the relationship between them and the affecting factors (Jo & Bang, 2022; Purwaningsih & Nurmala, 2021).

Problematic digital game playing in adolescents causes many psychosocial and mental problems along with basic needs such as nutrition, sleep and physical activity. Nurses help ensure and maintain the physiological, psychological and mental development of adolescents by fulfilling their protective, defensive, educational and consultancy roles. Schools are one of the most effective places where nurses can perform their educational and consultative role in controlling play and gaining healthy lifestyle behaviors (Anttila et al., 2020; Xu et al., 2020).

Digital game addiction is becoming a bigger and more important problem day by day and causes many negative situations in individuals such as inactivity, obesity, dexterity, eye disorder, headache, aggressiveness, antisocial behavior and tendency to violence is happening. When we look at the literature, it is seen that spending time with technological devices distracts children from activities such as sports and playing games. Another study found that there was a significant negative relationship between the motivation to participate in physical activity and the motivation to play digital games in high school students (Anttila et al., 2020; Xu et al., 2020).

Adolescents spending inactive time with technological devices for a long time negatively affects their gross and fine motor development, such as large and small muscle skills, hand and eye coordination. For this reason, it has been reported that playing with toys should be encouraged instead of using technological devices in order to minimize potential musculoskeletal disorders and sedentary lifestyle in adolescents (Aziz et al., 2021; Brunborg et al., 2013). It has been reported that adolescents are at greater risk than adults in terms of musculoskeletal system problems because they have been

introduced to technological devices from an early age and technological products are designed for adults. For this reason, adolescents with game addiction are likely to experience musculoskeletal problems due to long term use of technological devices. It is very important for adolescent children to be more active and minimize the time they spend with digital games for their healthy development (Aziz et al., 2021; Männikkö et al., 2015).

Schools ensure that the physical, cognitive and social development of adolescents is at the fastest stage, cooperation can be made with families and educators, more willing participation in educational programs with the peer group is ensured, peer-based education programs are successful, they are more economical than other educational methods. Since they are nomic, they are thought to be the most suitable areas for detecting health risks and teaching positive health behaviors (Coyne et al., 2015; Xu et al., 2020). School health nurse; is a member of the school health team that protects and improves the health of students, teachers and staff, and provides care, education and consultancy services. The school health nurse, in order to create a healthy society with healthy children at its core; It has an effective role in identifying and preventing adolescent groups at risk for digital game addiction and the relationship between digital game addiction and healthy lifestyle behaviors. In this direction; In order to prevent digital game addiction and the comorbid conditions it creates, school administration should plan and implement educational programs that provide healthy gaming and positive life behaviors in cooperation with teachers and families. Guidance programs such as restricting the hours of playing digital games, spending active time with family and friends, directing the adolescent to physical activity (sports, football, swimming, etc.) that interest him or her are among the roles of the school nurse. (Anttila et al., 2020; Xu et al., 2020)

To summarize the interventions to combat gaming addiction in adolescents;

- Conducting screenings to detect game addiction in schools,

- Students who are male and are in the 12th grade, studying in vocational high schools, are considered as a risk group and are given priority in prevention programs.
- Providing sleep hygiene training to students with sleep problems and directing them to sports activities to increase their physical activity levels,
- Conducting interviews with adolescents and their families explaining the importance of positive social relationships for a healthy lifestyle,
- Providing counseling to adolescents on how to turn their spare time into effective and useful activities,
- Giving seminars to parents about game addiction and its negative effects,
- Organizing training for adolescents on regular nutrition and weight control, and effective methods of coping with stress,
- Creating the necessary infrastructure to increase physical activity in schools and organizing educational programs that will encourage physical activity,
- Interventional studies showing the relationship between game addiction and a healthy lifestyle should be planned.

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Van Rooij, A. J., Kuss, D. J., Griffiths, M. D., Shorter, G. W., Schoenmakers, T. M., & Van De Mheen, D. (2014). The (co-)occurrence of problematic video gaming, substance use, and psychosocial problems in adolescents. *Journal of Behavioral Addictions*, *3*(3), 157–165. https://doi.org/10.1556/JBA.3.2014.013

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CHAPTER IV

Patient Safety in the Operating Room: A Bibliometric Analysis

Hülya SARAY KILIÇ[1]

Introduction

Science mapping is a powerful tool used for analyzing and visualizing relationships and trends in scientific literature through big data analysis. When applied to the topic of Patient Safety in the Operating Room, it can help us better understand how studies on the safety of surgical procedures and hospital environments have evolved. Analyses conducted using science mapping to identify the main themes, important subtopics, and leading researchers in this field can provide valuable insights for developing patient safety strategies and reducing risks in the operating room.

Patient Safety in the operating room aims to identify potential risks during surgical procedures, address communication deficiencies, and minimize procedural errors. The Science Mapping

[1] Assistant Professor, Bilecik Şeyh Edebali University

approach can help visualize the focus areas of research in this field and emerging subtopics, providing insights into which areas are prioritized and where more research is needed. It can also reveal the contributions of different countries and institutions to patient safety in the operating room and uncover collaboration potentials.

The application of science mapping to patient safety in the operating room is useful for assessing progress in the field, observing interactions between different disciplines, and identifying future research directions. This approach can help us understand the impact and effectiveness of research to improve patient and healthcare professional safety, and provide a knowledge-based approach to making decisions to improve patient safety standards in the operating room.

Bibliometric analysis is one of the most important techniques that allows a macroscopic study of the literature and provides the reader with a projection. For this reason, those who want to follow the characteristics and development process of scientific outputs within a particular research area can apply this method of analysis (Kurutkan, Orhan, 2018). The study framework we have determined for our study on Patient Safety in the Operating Room is shown in Figure 1.

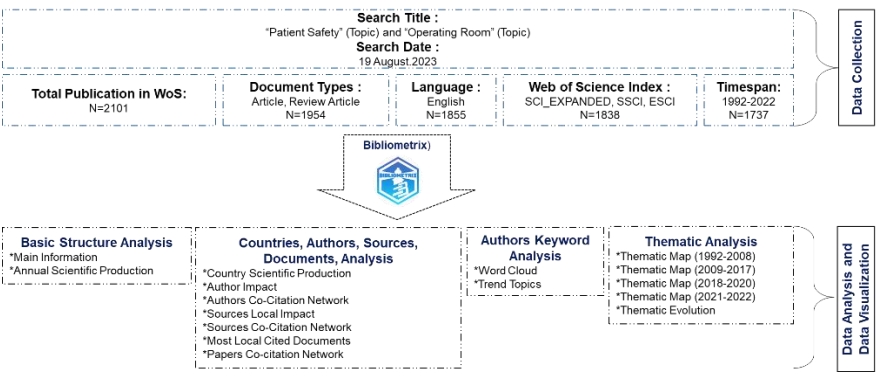


Figure 1. Flowchart of Data Collection, Data Analysis, and Data Visualization

Web of Science (WoS) database, which is widely preferred for bibliometric analysis or literature searches, was used in our study (Leydesdorff, 2012). The data screening was carried out in the WoS database on 19.08.2023. The next step was to extract and filter the data retrieved from the database. When publications on ["Patient Safety" (Subject) and "Operating Room" (Subject)] were searched in WoS database, 2101 articles were identified. When "Article, Review Article" was selected as the publication type, 1954 articles were found. Selecting "English" as the publication language returned 1855 articles, and selecting "SCI_EXPANDED, SSCI, ESCI" as the WoS index returned 1838 articles. Since new publications are still entering the database, articles from 2023 were excluded and a total of 1737 articles were included in the study.

The Bibliometrix program was used to analyze the data obtained. The Bibliometrix program is one of the latest open source software for scientific mapping based on R (Aria, Cuccurullo, 2017). There are many packages and libraries written in R, and R Studio provides the ability to easily manage and use these packages. Users can use these packages to perform the analytical tasks they want and make the data analysis process more effective.

In our review, 1737 articles were analyzed in four sections. The first part was the basic structure analysis of the articles in the field of patient safety in the operating room, the second part was the country, author, journal and article analysis, the third part was the author keyword analysis and the fourth part was the thematic analysis. No word combinations were used in the analysis.

Basic Structure Analysis

Basic information on patient safety in the operating room is presented in Table 1. A total of 1737 documents were analyzed in a period between 1992 and 2022. These documents were obtained from 600 different sources (journals, books, etc.). According to the data, the annual growth rate of the documents is calculated as 18.7%. The average age of the documents is 7.13 years and the average

number of citations per document is 25.76. In addition, a total of 39,661 reference sources were included.

Table 1. Main Information

Description	Results	Description	Results
MAIN INFORMATION ABOUT DATA		Single-authored docs	93
Timespan	1992:2022	Co-Authors per Doc	5.4
Sources (Journals, Books, etc)	600	International co-authorships %	15.03
Documents	1737	DOCUMENT TYPES	
Annual Growth Rate %	18.7	article	1371
Document Average Age	7.13	article; book chapter	1
Average citations per doc	25.76	article; early access	8
References	39661	article; proceedings paper	72
DOCUMENT CONTENTS		review	282
Keywords Plus (ID)	2500	review; book chapter	2
Author's Keywords (DE)	3068	review; early access	1
AUTHORS			
Authors	7315		
Authors of single-authored docs	87		

According to the analysis, 15.03% of the documents were created in international cooperation. The number of authors of the documents is 7315, of which 87 are single-author documents. On average, there are 5.4 co-authors in the documents. The most common type of documents are articles (78.87%). In terms of keywords, 2500 "Keywords Plus (ID)" and 3068 "Author's Keywords (DE)" were identified. According to these data, there has been a significant publication activity on patient safety in the operating room over a period of 30 years. The fact that international collaboration in the studies is over 15% shows that the topic is of global importance. In addition, the low average age of the documents indicates that research in this area is still current. The high average number of citations indicates that the topic attracts considerable attention in the academic world and that the studies in this field are followed by a wide audience.

The annual number of scientific publications produced in the field of patient safety in the operating room between 1992 and 2022 was obtained using Bibliometrix, as shown in Figure 2. This figure, which shows the scientific production in the field of Patient Safety in the Operating Room by year, clearly shows the level of interest in the subject over time and the increase in research activity. Starting in 1992, the data show a clear upward trend in the following years. In particular, there has been a significant increase in production since the 2010s.

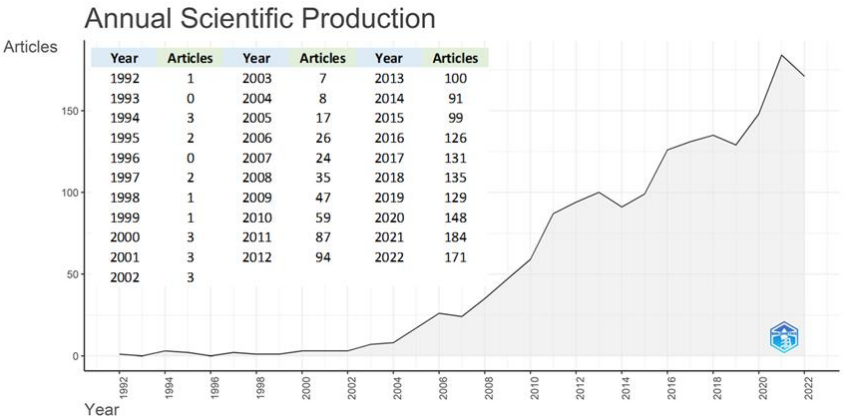


Figure 2. Annual Scientific Production

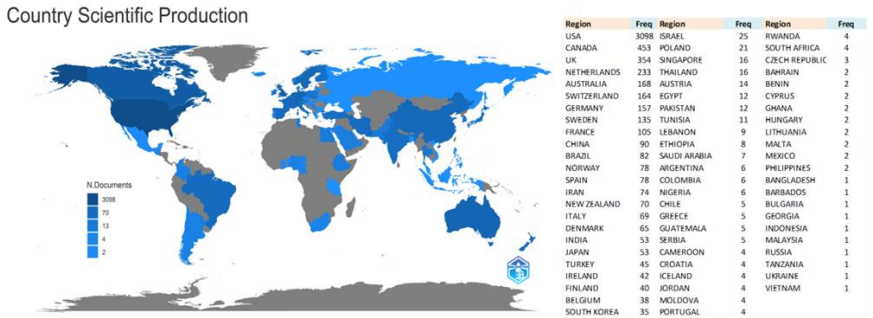
Scientific production, which started at a low level in the early years, increased steadily towards the mid-2000s. In particular, since 2010, production has increased rapidly and reached its peak. This increase shows that the issue of patient safety in the operating room is becoming more and more important in the field of health care and that researchers are focusing on this area.

The number of studies conducted in recent years is quite high and shows an increasing trend. This shows that patient safety in the operating room is perceived as a priority issue in the health sector and has aroused great interest in the research field. The rapid increase, especially in recent years, is also important in terms of understanding how studies on this topic are reflected in clinical practice and patient safety policies.

Countries, Authors, Sources, Documents Analysis

The countries and the number of articles on patient safety in the operating room are shown in Figure 3. According to these data, it is clear that there are great differences in the production of scientific publications between countries. The USA, the country with the highest number of publications, tops the list with 3098 publications, while Bangladesh, Barbados, Bulgaria, Georgia, Indonesia, Malaysia, Russia, Tanzania, Ukraine, and Vietnam, the

countries with the lowest number of publications, are represented with only 1 publication. This situation shows that there are large disparities in scientific productivity among countries. Turkey ranks 20th out of 70 countries with 45 articles.



Region	Freq	Region	Freq	Region	Freq
USA	3098	ISRAEL	25	RWANDA	4
CANADA	453	POLAND	21	SOUTH AFRICA	4
UK	354	SINGAPORE	16	CZECH REPUBLIC	3
NETHERLANDS	233	THAILAND	16	BAHRAIN	2
AUSTRALIA	168	AUSTRIA	14	BENIN	2
SWITZERLAND	164	EGYPT	12	CYPRUS	2
GERMANY	157	PAKISTAN	12	GHANA	2
SWEDEN	135	TUNISIA	11	HUNGARY	2
FRANCE	105	LEBANON	9	LITHUANIA	2
CHINA	90	ETHIOPIA	8	MALTA	2
BRAZIL	82	SAUDI ARABIA	7	MEXICO	2
NORWAY	78	ARGENTINA	6	PHILIPPINES	2
SPAIN	78	COLOMBIA	6	BANGLADESH	1
IRAN	74	NIGERIA	6	BARBADOS	1
NEW ZEALAND	70	CHILE	5	BULGARIA	1
ITALY	69	GREECE	5	GEORGIA	1
DENMARK	65	GUATEMALA	5	INDONESIA	1
INDIA	53	SERBIA	5	MALAYSIA	1
JAPAN	53	CAMEROON	4	RUSSIA	1
TURKEY	45	CROATIA	4	TANZANIA	1
IRELAND	42	ICELAND	4	UKRAINE	1
FINLAND	40	JORDAN	4	VIETNAM	1
BELGIUM	38	MOLDOVA	4		
SOUTH KOREA	35	PORTUGAL	4		

Figure 3. Country Scientific Production

On a continental basis, North America (USA and Canada) generally has a high level of publishing production. European countries (UK, Netherlands, Switzerland, Germany, Sweden, France) also have significant broadcasting activity. In Asia, large countries such as China and India, as well as Japan, have some broadcasting production. In South America, only Brazil has a significant publishing output, while the number is lower in Africa.

It can be said that there is a relationship between the level of development of a country and the amount of articles produced. In general, developed countries tend to produce more scientific publications. This may be due to factors such as a more developed research infrastructure, funding opportunities, education system and scientific collaboration networks. In addition, researchers in these countries have access to a broader academic environment and resources, which may contribute to the production of more publications.

The h-index, g-index, m-index, total citations (TC), total number of publications (NP), and year of first publication (PY-Start)

of the top 20 authors who contributed the most to the field of patient safety in the operating room are presented in Table 2.

Table 2. Author Impact

Author	h_index	g_index	m_index	TC	NP	PY_start
SEVDALIS N	19	30	1,118	2056	30	2007
ARORA S	14	16	0,933	1331	16	2009
PRONOVOST PJ	14	18	0,737	1840	18	2005
DARZI A	13	17	0,929	1175	17	2010
CATCHPOLE K	12	22	0,75	712	22	2008
GAWANDE AA	11	11	0,688	898	11	2008
MILLS PD	11	14	0,647	408	14	2007
NEILY J	10	13	0,588	480	13	2007
OSTERGAARD D	10	12	0,714	374	12	2010
SEXTON JB	10	10	0,556	2300	10	2006
VINCENT C	10	12	0,714	858	12	2010
AGGARWAL R	9	11	0,643	884	11	2010
GILLESPIE BM	9	12	0,643	359	12	2010
HULL L	9	9	0,643	562	9	2010
LEE J	9	10	0,474	405	10	2005
MAKARY MA	9	9	0,474	1206	9	2005
MANSER T	9	10	0,6	1344	10	2009
WEINGER MB	9	11	0,429	314	11	2003
BAGIAN JP	8	9	0,471	349	9	2007
BERRY WR	8	9	0,533	675	9	2009

NP = Number of publications, TC = Total citations, PY_start = Publication year starting.

When we evaluate the authors according to the given h-index ranking, different metrics such as h-index, g-index, m-index, total number of citations and total number of publications are used to measure the scientific impact of each author. These values help us to evaluate the scientific achievements and impact of the authors from different aspects.

The H-index (Hirsch index) refers to a situation where at least h articles of an author have at least h citations (Hirsch, 2005) (Kamdem, Duarte et al., 2019). This metric measures the scholarly impact of an author by reflecting how often his or her publications are cited. In this context, authors such as Sevdalis N, Arora S, and Pronovost PJ have H-indexes ranging from 14 to 19, while their high number of citations and number of articles indicate that their academic impact is high.

The G-index is a metric calculated by taking into account the number of citations of publications and the number of articles. This metric attempts to measure impact by better reflecting the citation distribution of an author's publications (Egghe, 2006). Again, it can be seen that the G-index values of authors such as Sevdalis N, Catchpole K and Pronovost PJ are high compared to other authors.

One way to compare academics with academic careers in different time periods is to divide the h-index by the number of years of academic activity. This index is defined as the m-index (Harzing, 2012). It is noteworthy that authors such as Sevdalis N, Arora S and Darzi A have high m-index values.

Total citations and total publications reflect how many citations an author has received and how many articles they have produced over the course of their career. These metrics can help assess an author's overall scholarly impact and productivity. The author with the highest number of citations is Sevdalis N with 2056 citations. Sevdalis N also has the highest number of publications with 30.

The authors who are in the top 20 most influential authors and who started publishing closest to the present are Darzi A (2010), Ostergaard D (2010), Vincent C (2010), Aggarwal R (2010), Gillespie BM (2010) and Hull L (2010). These authors have quickly become influential in the field of patient safety in the operating room.

The author co-citation network analysis was performed to examine the co-citations of the authors of the Patient Safety in the Operating Room articles. As shown in Figure 4, the co-citation network is divided into three node clusters consisting of circles. The first 30 authors were analyzed. The Louvain algorithm was used.

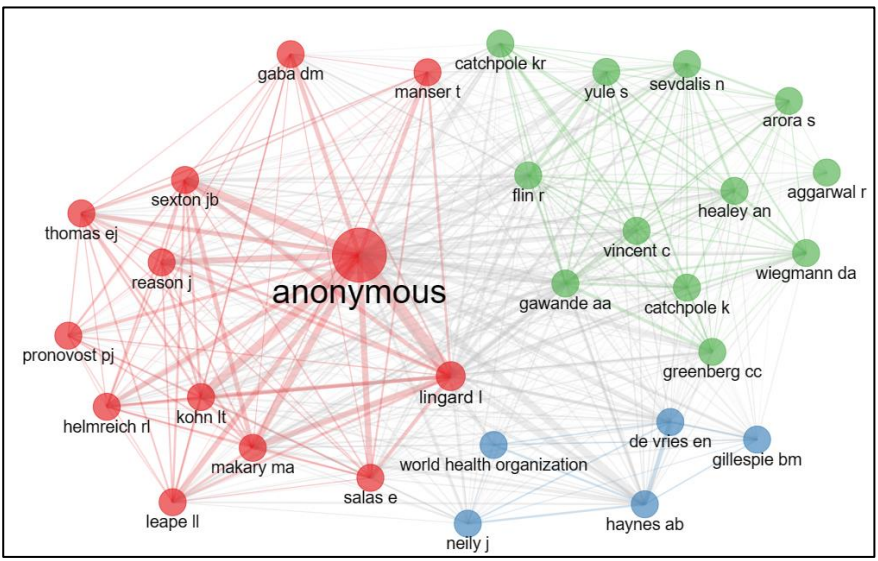


Figure 4. Authors Co-Citation Network

The red cluster was the largest cluster. The red cluster consisted of 13 authors, the green cluster of 12 authors and the blue cluster of 5 authors. In the red cluster, Anonymous, which represents publications from official institutions without a central author, is the most cited author. When the WOS database was examined, it was found that the authors of publications whose author names were not listed in the bibliography were listed as Anonymous. Except for the

anonymous author in the red cluster, there are no prominent authors in the blue and green clusters. However, when analyzing the line thickness between them and the most cited authors, Anonymous - Lingard L, Anonymous - Sexton JB, Anonymous - Kohn LT, Anonymous - Makary MA, Anonymous - Reason J, Anonymous - Salas E in the red cluster, Anonymous - Haynes AB in the red and blue clusters are the author duos most cited by subsequent authors.

Table 3 shows the top 20 journals ranked by h-index (Source Local Impact). These top 20 journals publish 26.65% (467/1752) of the total articles. The journal with the highest H-index is Annals of Surgery (25). This journal stands out as a highly influential and reputable publication in its field. The journal with the highest G-index is also Annals of Surgery (38). The journal with the highest M-index is BMJ Quality & Safety (1,692). TC and NP show how often journals are cited and how many articles they have published. The journal with the highest citation value is Annals of Surgery (2846) and the journal with the highest number of publications is Anesthesia And Analgesia (46).

Table 3. Source Local Impact

Source	H-Index	G-Index	M-Index	TC	NP	TC/NP	PY start
ANNALS OF SURGERY	25	38	1,042	2846	38	74,89	2000
BMJ QUALITY & SAFETY	22	35	1,692	1809	35	51,69	2011
ANESTHESIA AND ANALGESIA	19	36	0,731	1378	46	29,96	1998
SURGICAL ENDOSCOPY AND OTHER INTERVENTIONAL TECHNIQUES	18	30	0,667	996	44	22,64	1997
AMERICAN JOURNAL OF SURGERY	16	29	0,696	1193	29	41,14	2001
JOURNAL OF THE AMERICAN COLLEGE OF SURGEONS	16	21	0,889	1573	21	74,90	2006
QUALITY & SAFETY IN HEALTH CARE	15	15	0,75	1897	15	126,47	2004
SURGERY	14	20	0,778	1053	20	52,65	2006
WORLD JOURNAL OF SURGERY	13	19	0,765	565	19	29,74	2007
ANESTHESIOLOGY	11	12	0,367	682	12	56,83	1994
BMC HEALTH SERVICES RESEARCH	11	18	0,611	1317	18	73,17	2006
BRITISH JOURNAL OF ANAESTHESIA	11	19	0,579	710	19	37,37	2005
CURRENT OPINION IN ANESTHESIOLOGY	10	17	0,556	355	35	10,14	2006
INTERNATIONAL JOURNAL FOR QUALITY IN HEALTH CARE	10	15	0,769	289	15	19,27	2011

JOURNAL OF SURGICAL EDUCATION	10	19	0,769	393	28	14,04	2011
PATIENT SAFETY IN SURGERY	10	15	0,625	257	18	14,28	2008
SURGICAL CLINICS OF NORTH AMERICA	10	16	0,526	469	16	29,31	2005
AMERICAN JOURNAL OF MEDICAL QUALITY	9	13	0,643	288	13	22,15	2010
BMJ OPEN	9	15	0,818	243	16	15,19	2013
JAMA SURGERY	9	10	0,9	1886	10	188,60	2014

NP = Number of publications, TC = Total citations, TC/NP = Citations per paper, PY_start = Publication year starting

TC/NP (citations per paper) shows how many times an average article in a journal is cited. JAMA Surgery stands out in this evaluation as it receives a very high number of citations per article. PY_start (Publication Year Starting) indicates when the journal started publishing. Older journals may have the opportunity to be cited for a longer period of time. Older journals such as Anesthesiology (1994) and Annals of Surgery (2000) have been influential in the field for a longer period of time. However, Jama Surgery (2014), which started publishing more recently, has become influential in the field in a short period of time. In general, journals such as Annals of Surgery, BMJ Quality & Safety, Anesthesia And Analgesia, Jama Surgery seem to have high impact factors in the area of patient safety in the operating room.

Sources Co-citation Network analysis was performed to examine the co-citation of sources of articles on patient safety in the operating room. The Louvain algorithm was used and the first 30 articles were analyzed. As seen in Figure 5, the co-citation network is divided into two clusters of nodes consisting of circles. Each circle in the clusters represents one source.

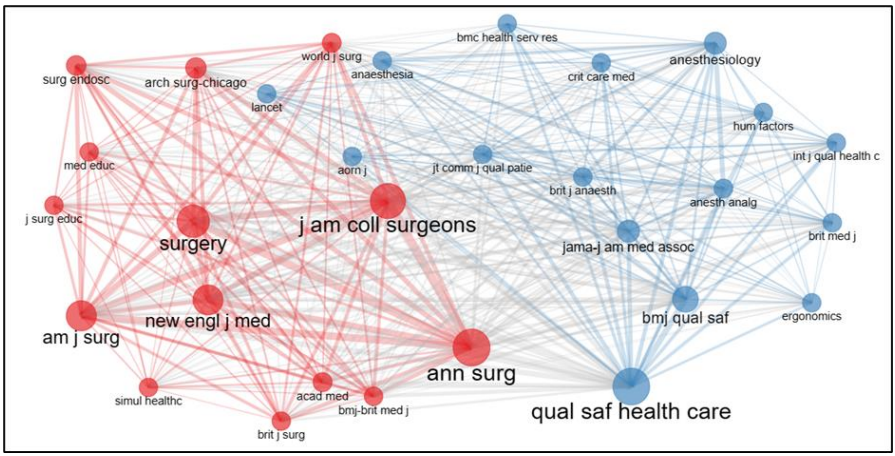


Figure 5. Sources Co-Citation Network

The blue cluster is the central cluster with high centrality and has 16 journals. The journal Qual Saf Health Care is located in the middle. Other journals in the blue cluster that are influential in the co-citation network are BMJ Qual Saf, Anesthesiology, Jama-J Am Med Assoc. Ann Surg is in the center of the red cluster. Other journals in the red cluster that are influential in the co-citation network are J Am Coll Surgeons, Surgery, Am J Surg, New Engl J Med.

The thickness of the line between them shows that Ann Surg - Ann Surg - Surgery, Ann Surg - New Engl J Med, Ann Surg - J Am Coll Surgeons - Surgery, J Am Coll Surgeons - Am J Surg, J Am Coll Surgeons - New Engl J Med, Am J Surg - Surgery, received the highest number of co-citations.

A citation analysis was performed to identify the most cited articles and the links between these articles in the field of patient safety in the operating room. Citation analysis is commonly used to investigate the underlying intellectual structure and developmental dynamics of a review area. The 20 most cited publications in the review area of Harvest Safety in the Operating Room are presented in Table 4 in descending order of the number of local citations (LC). The articles in this table were published between 2004 and 2015.

This indicates that the topic of patient safety in the operating room has become increasingly important, especially since the early 2000s.

Table 4. Most Local Cited Documents

Document	YP	LC	LC/YYP	GC	GC/ YYP	LC/GC Ratio%
LINGARD L, 2004, QUAL SAF HEALTH CARE	2004	19 8 10	10,421	786	41,368	25,19
CHRISTIAN CK, 2006, SURGERY	2006	7	6,294	314	18,471	34,08
MAKARY MA, 2006, J AM COLL SURGEONS	2006	10 4	6,118	401	23,588	25,94
SEXTON JB, 2006, BMC HEALTH SERV RES	2006	87	5,118	1045	61,471	8,33
HAYNES AB, 2011, BMJ QUAL SAF	2011	67	5,583	304	25,333	22,04
MANSER T, 2009, ACTA ANAESTH SCAND	2009	66	4,714	697	49,786	9,47
AWAD SS, 2005, AM J SURG	2005	65	3,611	227	12,611	28,63
SEXTON JB, 2006, ANESTHESIOLOGY	2006	64	3,765	201	11,824	31,84
CATCHPOLE K, 2008, ANN SURG	2008	63	4,200	247	16,467	25,51
CATCHPOLE KR, 2007, SURGERY	2007	56	3,500	169	10,563	33,14
WAHR JA, 2013, CIRCULATION	2013	50	5,000	171	17,100	29,24
WEAVER SJ, 2010, JT COMM J QUAL PATIE	2010	42	3,231	182	14,000	23,08
WHEELOCK A, 2015, ANN SURG	2015	40	5,000	133	16,625	30,08
LINGARD L, 2005, QUAL SAF HEALTH CARE	2005	39	2,167	149	8,278	26,17
RUSS S, 2013, ANN SURG	2013	39	3,900	187	18,700	20,86
UNDRE S, 2007, WORLD J SURG	2007	36	2,250	138	8,625	26,09
PIAN-SMITH MCM, 2009, SIMUL HEALTHC	2009	36	2,571	149	10,643	24,16
WOLF FA, 2010, ANN SURG	2010	34	2,615	96	7,385	35,42
ARORA S, 2010, AM J SURG	2010	33	2,538	117	9,000	28,21
HULL L, 2011, J AM COLL SURGEONS	2011	33	2,750	137	11,417	24,09

Year of Publication (YP), YYP= Year 2023-Year of Publication, Global Citations (GC), Local Citations (LC).

The article by Lingard L, 2004, has 198 local citations and a total of 786 global citations. The number of local citations per year of publication is quite high (10,421). The ratio of the total number of local citations to the total number of global citations (25.19%) shows that the global citations of the article have an impact that exceeds the local citations. The article Christian CK, 2006 has LC=107 and

LC/CYP = 6,294. Considering the other data, it can be said that the article had a long-lasting impact. Makary MA, 2006 article has a significant value in terms of both local and global citations. Both LC/CRP = 6,118 and GC/CRP = 23,588 are high. This shows that the article is frequently cited both locally and globally. The article Sexton JB 2006 has a very high GC/GC Ratio = 61,471. The LC/GC Ratio% is low at 8.33%. It can be seen that it is cited more in the global area. Wheelock A 2015, which is the closest to the present, has become influential in the field in a short time. The most influential articles in this field are Lingard L, 2004, Christian CK, 2006, Makary MA, 2006, Sexton JB, 2006. The fact that they address seminal questions, conduct comprehensive studies, and have long been used as references in the field can be considered among the reasons for their influence.

A paper co-citation network analysis was performed by examining the co-citations of publications in the patient safety in the operating room literature. The Louvain algorithm was used and the first 30 papers were analyzed. As seen in Figure 6, the co-citation network is divided into four node clusters consisting of circles. Each circle in the clusters represents one article. The presence of a connecting line between the circles indicates that there is a relationship between them. The thicker the line, the more related they are.

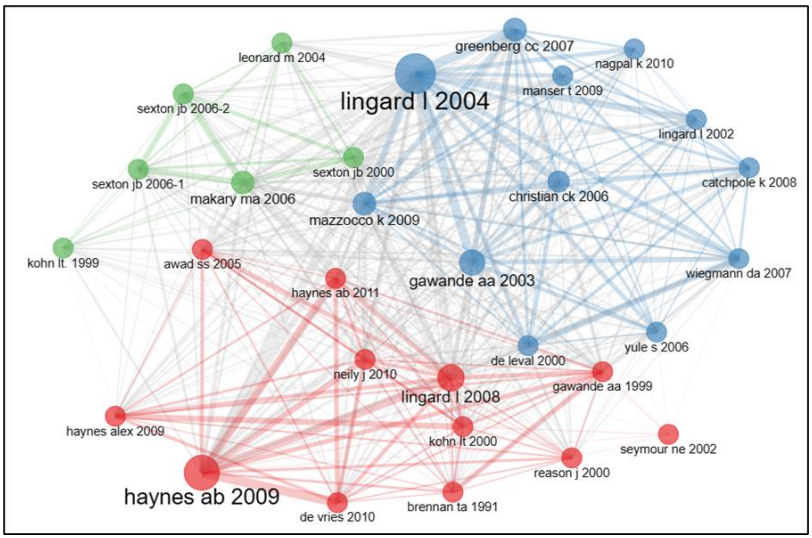


Figure 6. Papers Co-Citation Network

The blue cluster consists of 12 articles, the red cluster of 12 articles and the green cluster of 6 articles. Lingard L 2004 in the blue cluster is the most co-cited article. The other most cited articles are Haynes AB 2009, Lingard L 2008 in the red cluster, Gawande AA 2003, Greeberg CC 2007 in the blue cluster and Makary MA 2006 in the green cluster.

In terms of the thickness of the line between them, the most cited article pairs are Lingard L 2004 - Gawande AA 2003, Lingard L 2004 - Christian CK 2006, Lingard L 2004 - Greenberg CC 2007, Lingard L 2004 - Haynes AB 2009, Lingard L 2004 - Makary Ma 2006, HAynes AB 2009 - Haynes AB 2011, Haynes AB 2009 - Lingard L 2008, Haynes AB 2009 - De Vries 2010.

Authors Keyword Analysis

Keywords are determined by the authors to define the article. Considering that these keywords represent the article, it is considered noteworthy to analyze with these words and identify the current topics and themes of the field of study (Zheng, Le et al., 2016). Through the word cloud, it becomes easier to identify

intertwined fields and analyze the words that have been on the agenda of these fields over the years (Orimoloye, Ololade, 2020). The larger the keywords appear, the more frequently they were used in the data set. The most frequent keywords identified by the authors and the top 50 keywords used by the bibliographies are shown in Figure 7 as a word cloud and the top 20 as a frequency table. No word merging was performed to analyze all author keywords. The first five words with the highest frequency in the author keywords are patient safety, operating room, teamwork, surgery, communication, while the keywords used in the bibliographies are operating room, patient safety, performance, care, surgery.

Terms	Frequency
patient safety	547
operating room	145
teamwork	127
surgery	126
communication	106
simulation	78
quality improvement	73
safety	64
human factors	57
checklist	53
training	45
education	44
operating rooms	42
adverse events	34
anesthesia	34
non-technical skills	33
surgical education	32
medical errors	28
safety culture	28
surgical training	27

Terms	Frequency
operating-room	571
patient safety	349
performance	262
care	215
surgery	210
communication	180
safety	150
teamwork	150
impact	146
adverse events	125
implementation	122
health-care	118
quality	114
mortality	102
errors	93
management	89
skills	83
outcomes	80
checklist	76
system	76

Figure 7. Word Cloud

The graph in Figure 8 shows which of the keywords identified by the authors became popular in which years. The first three keywords used at least five times in each year are visualized. While the keywords ICU, review, monitoring, literature review, safety checklist, residency were used more frequently in the study of operating room and patient safety between 2006 and 2012, the keywords cardiac surgery, flow disruption, airway management, nursing, qualitative research, speaking up became more trendy. Looking at the size of the circles, patient safety, and operating room

reached the highest usage volume in 2018, teamwork, surgery in 2017, and communication in 2016. Figure 8 shows which other words were trending in which years.

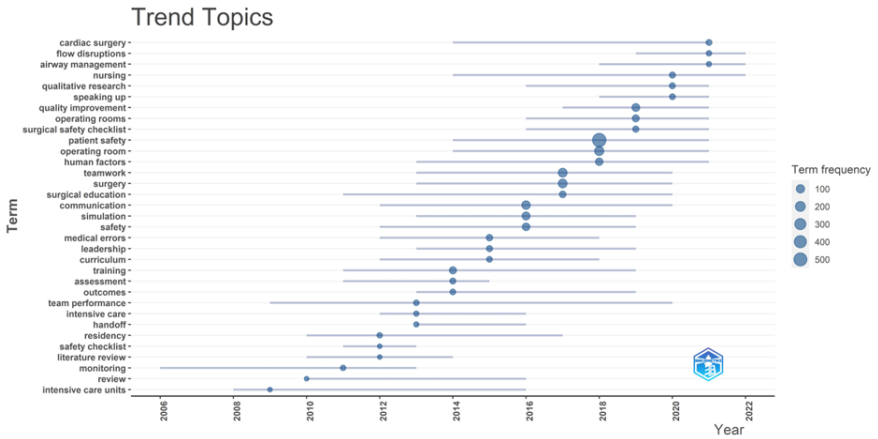


Figure 8. Trend Topics

Thematic Analysis

Using the first 250 author keywords that were repeated at least five to three times, the total period of patient safety in the operating room generated by Bibliometrix, 1992-2022, was divided into 4 subperiods. The most repeated keywords were grouped into subject clusters. Each cluster is represented by the top three most recurring words. The size of the circles is proportional to the frequency of use of the keyword representing the circle. In thematic mapping analyses, research themes are visualized through networks that are resolved over multiple time periods, allowing for the identification of their dynamics (Schöggl et al., 2020). A strategic diagram reflects the interactions of factors in a given research topic over time. This diagram is a static description of the network structure of a study area (Shaikevich, IM., 1973). The strategic diagram is divided into four disks that express the themes. Each slice is interpreted within itself. For this purpose, two parameters including centrality and intensity were determined. The intensity parameter represents the thematic map as the y-axis and the

centrality parameter as the x-axis. The more central the selected theme is, the more important it is, and the more intense it is, the more developed it is (Nasir, Shaukat et al., 2020).

The research period (1992-2022) was divided into four consecutive sub-periods, taking into account the number of documents and the time window. Although it is more common to define subperiods with equal time segmentation, the first subperiod is 17 years (1992-2008), the second subperiod is 9 years (2012009-2017), the third subperiod is 3 years (2018-2020), and the fourth subperiod is 2 years (2021-2022) due to limited publications in the early years.

"Engine Themes, representing the concepts of high density and high centrality that are developed and essential to the study area, are located in the upper right quadrant of the thematic map. "Niche Themes, representing highly developed but isolated high density and lower centrality, are located in the upper left quadrant of the theme map. Emerging or Declining Themes, representing emerging or declining low centrality and low density, are located in the lower left quadrant of the Theme Map. "Basic Themes," which have been extensively researched and have well-developed internal linkages with low density and high centrality, are located in the lower right quadrant of the thematic map (Cobo, López-Herrera et al., 2011).

Because motor themes have high centrality and intensity characteristics, important studies have been conducted on these themes and they have reached maturity. Niche themes are those with low centrality and high intensity, which have ceased to be the main field of study and are concentrated in specific areas, but outside the general research framework. Emerging or declining topics are those that have neither sufficient centrality nor intensity. These topics have been studied, but not given sufficient importance. Core themes are those with high centrality and low intensity. They are at the center of the study topic, but have not yet been sufficiently studied. Therefore, the focus of the research on patient safety in the operating room is on core themes.

The thematic map for the years 1992-2008 is shown in Figure 9. The themes that emerged in the period 1992-2008 are safety, simulation within the motor themes, communication within the niche themes, surgical education, intraoperative within the rising or falling themes, patient safety, adverse events within the core themes, monitoring theme at the intersection of all four quadrants, technology assessment theme between the motor theme and the niche theme, medical errors theme between the niche theme and the rising or falling themes. Accordingly, the theme consisting of the keywords patient safety, operating room of the future and the theme consisting of the keywords adverse events, human factors, errors have been the main research topics for the years 1992-2008.

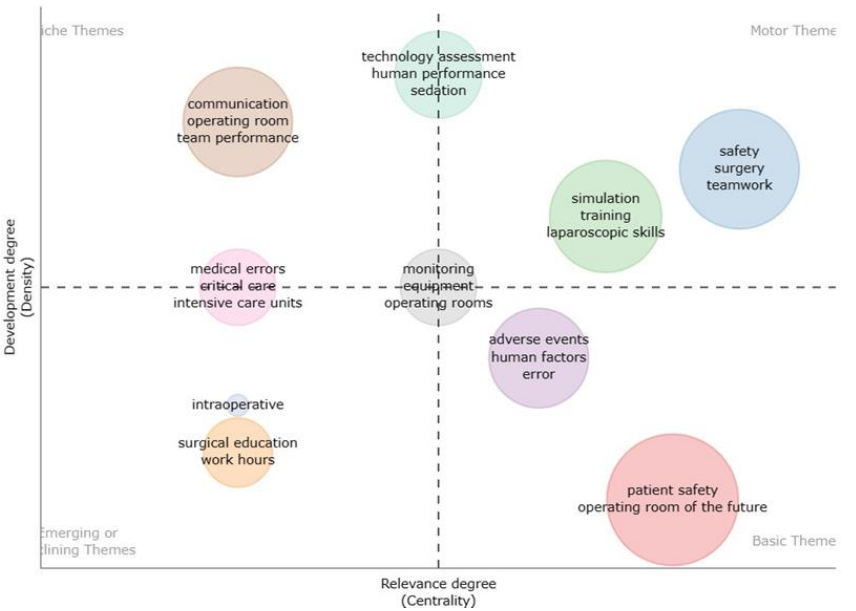


Figure 9. Thematic Map (1992-2008)

The thematic map for the years 2009-2017 is shown in Figure 10. Cost, workflow, anesthesia theme within niche themes, leadership theme within rising or falling themes, patient safety, safety, simulation themes within core themes, operating room theme

between motor theme and niche theme, surgery theme between motor theme and core themes are the themes that occurred in the period 2009-2017. Accordingly, the theme consisting of the keywords patient safety, checklist, quality improvement, the theme consisting of the keywords safety, checklists, outcomes and the theme consisting of the keywords simulation education, training have been the main research topics of the years 2009-2017.

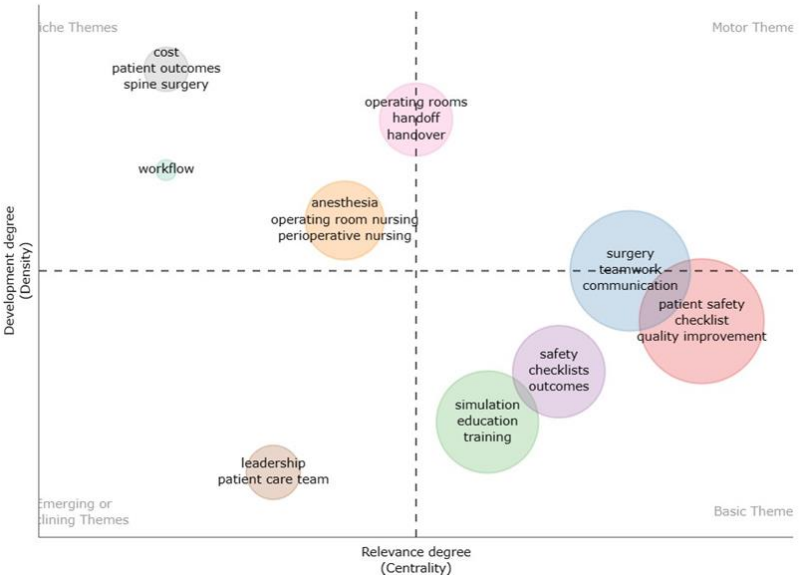


Figure 10. Thematic Map (2009-2017)

The 2018-2020 theme map is shown in Figure 11. Patient safety, anesthesia, checklist themes within motor themes, medical education theme within niche themes, teamwork, simulation, operating room themes within rising or falling themes, crew resource management theme within core themes are the themes that occur in the 2018-2020 period. Accordingly, the theme consisting of the keywords Crew Resource Management, Systematic Review, Anesthesiology within the main themes was the main research topic for 2018-2020.

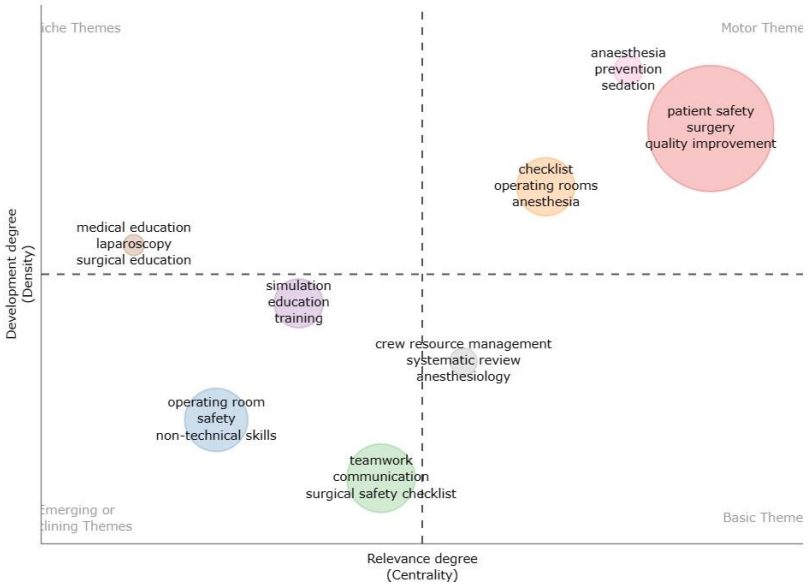


Figure 11. Thematic Map (2018-2020)

The theme map for 2021-2022 is shown in Figure 12. Simulation, Operating Room themes within the motor themes, Intraoperative Imaging, Speaking Up, Laparoscopy themes within the niche themes, Surgical Education, Surgery themes within the rising or falling themes, Patient Safety, Teamwork, Cardiac Surgery themes within the basic themes are the themes that occur in the 2021-2022 period. Accordingly, the theme consisting of the keywords patient safety, quality improvement, operating room within the basic themes, the theme consisting of the keywords teamwork, communication, human factors and the theme consisting of the keywords cardiac surgery, neurosurgery, mortality were the main research topics of 2021-2022.

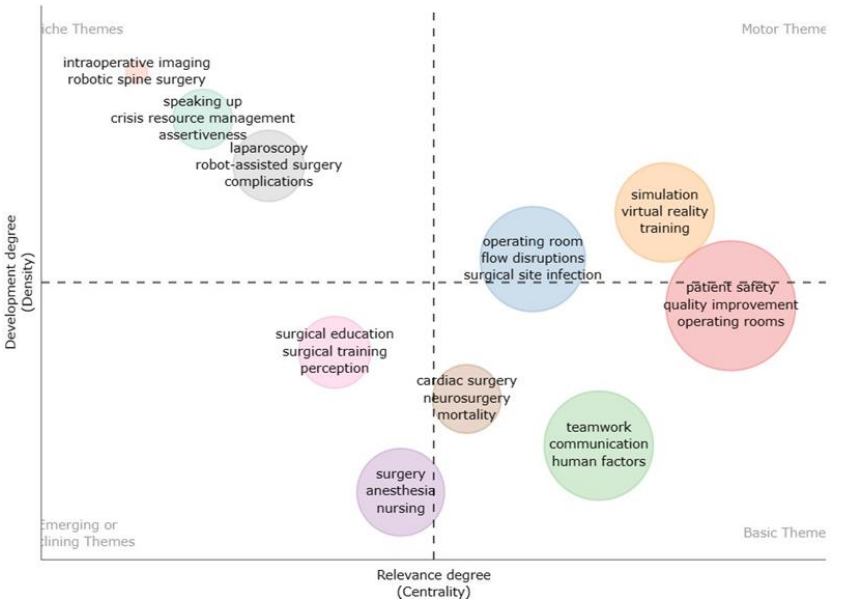


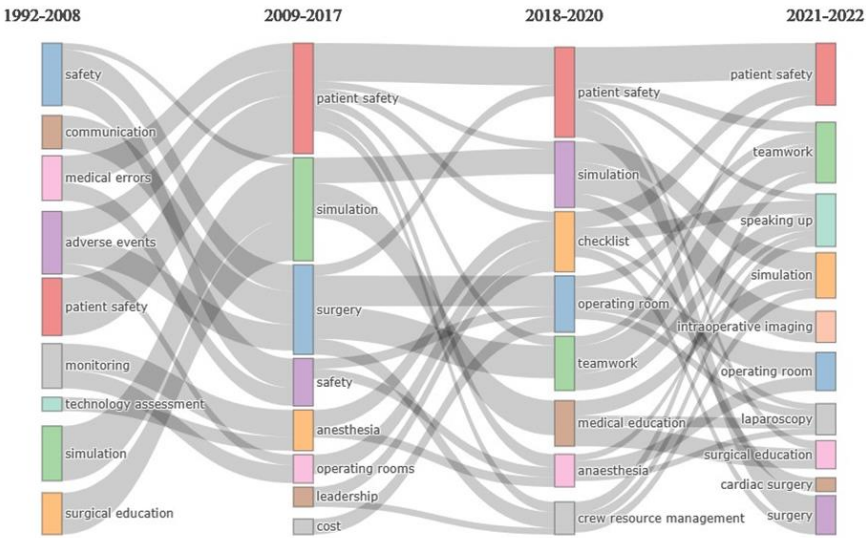
Figure 12. Thematic Map (2021-2022)

In addition to the four-period strategic diagrams, a four-period theme evolution mapping, visualized in Figure 13, was created to examine the change and evolution of the operating room and patient safety themes over the years. The size of the nodes indicates the number of keywords, and the flow lines between the nodes indicate the direction of evolution of the theme clusters over time. A theme that evolves over sub-periods can be considered a thematic area (Shi, Duan et al., 2020).

Analyzing the chart, there are 9 themes in the first period, 8 themes in the second period, 8 themes in the third period, and 10 themes in the fourth period. While patient safety was included in all four periods, the operating room theme was not included in the first period. The dominant theme of the 2009-2017 period, Patient Safety, was fed by the subthemes Medical Errors, Adverse Events, Patient Safety, while Patient Safety fed the themes Simulation, Checklist, Teamwork, Anesthesia, Crew Resource Management. The other theme, Operating Rooms, was fed by the Adverse Events and

Monitoring sub-themes and fed the Checklist theme. The Patient Safety theme, which is the dominant theme for 2018-2020, was fed by Patient Safety, Surgery sub-themes and fed the Patient Safety, Teamwork, Speaking up, Surgical Education, Surgery themes. The other theme, Operating Room, was fed by the sub-themes Surgery, Safety, Cost and fed the themes Teamwork, Operating Room, Laparoscopy. The dominant theme of the 2021-2022 period, Patient Safety, was fed by the sub-themes Patient Safety, Checklist, Teamwork, while the Operating Room theme was fed by the sub-themes Operating Room, Anesthesia. In the 2021-2022 period, the themes Teamwork, Speaking Up, Simulation, Intraoperative Imaging, Operating Room, Laparoscopy, Surgical Education, Cardiac Surgery, Surgery were formed together with the Patient Safety theme.

With these themes in mind, it is anticipated that topics such as technology integration and digital solutions, communication and team collaboration, patient education and information, staff training and skill development, risk management and error analysis will be explored in the coming years as they relate to patient safety in the OR.



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