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Use of Non-steroid anti-inflammatory drugs (NSAID) by mothers before birth and the risk of neurodevelopmental disorder in offspring: A discussion on community health, scientific evidence and the responsibilities of policy governors

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Non-steroidal anti-inflammatory drugs (NSAID) are one of the most commonly used classes of drugs worldwide due to their positive effects on pain, fever, and inflammation, and are included in the list of essential medicines regularly updated by the World Health Organization (WHO) (1,2). Most of these drugs, including acetaminophen (paracetamol), which is included in NSAIDs, can be sold without a prescription, and it is estimated that NSAIDs are used by approximately 30 million individuals worldwide every day (3). NSAIDs exert their effects by inhibiting prostaglandin synthesis and are estimated to be used in approximately 70.0% of all pregnancies. However, prostaglandins are also known to play a critical role in fetal development (1,4). The United States Food and Drug Administration (FDA) reported in 2020 that NSAID use after the 20th week of pregnancy may increase the risks of oligohydramnios, renal dysfunction in the fetus, and premature closure of the ductus arteriosus. It recommended that drug use be planned on an individual basis, weighing the benefits and risks, and based on a joint decision between the patient and clinician (5). In recent years, conflicting data obtained from studies focusing on the possible relationship between NSAID use during pregnancy and neurodevelopmental disorders, and the interpretation of this data by public officials and society outside of its context, have necessitated urgent and balanced consideration of the issue (6-8).

In studies, the odds ratios (OR) for attention deficit hyperactivity disorder (ADHD), autism spectrum disorders (ASD), and cognitive developmental delay in children of mothers who used NSAIDs during pregnancy were found to be 1.1-1.3, 1.1-1.2, and 1.1, respectively (9,10). A recent meta-analysis evaluating the results of 16 studies involving over two million children, conducted by Bérard and colleagues, found that NSAID use during pregnancy may only increase the risk for ADHD (OR= 1.2, 95% Confidence Interval= 1.1-1.3), this risk may also be dependent on confounding variables, and that the risk for other neurodevelopmental disorders is not increased (11). A review by Sheikh and colleagues also supports that NSAID use by mothers during pregnancy does not increase the risk of neurodevelopmental disorders in their children when other confounding variables, including the development of other siblings, are controlled (12). It should be noted that even in studies reporting an increase in risk, the increase is modest (13). OR is influenced by factors such as study design, effect size, and the prevalence of the disorder in the population, but in general, values of 2.0-3.0 and above are considered significant in epi-

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demiological studies (13). On the other hand, the relationships identified in observational studies do not indicate causality (14). It has been frequently observed that public administrators and the general public express the view that relationships observed at the group level are also valid at the individual level. These views are referred to as the “ecological fallacy” in epidemiology, and it is accepted that aggregate statistics cannot be directly applied to individual risks (15). Therefore, a meta-analysis reporting that NSAID use during pregnancy increases the risk of ADHD or ASD in children cannot be interpreted at the individual level as “every mother who uses NSAIDs increases the risk of ADHD or ASD in her child.” Relationships at the group level may not hold at the individual level due to different factors (genetic, environmental factors, etc.) (15). On the other hand, relationships observed at the individual level cannot be generalized to the group level, and such generalizations are called the “atomistic fallacy” (16). For example, the fact that some individuals have a relationship between their mothers' use of NSAIDs and their own ADHD or ASD diagnoses cannot be interpreted at the community level as “mothers' use of NSAIDs during pregnancy increases the risk of ADHD or ASD in their children.” The effect of NSAID doses and duration of use during pregnancy on children has also not been sufficiently evaluated (9-12). Therefore, it can be said that additional studies are needed in this area, controlling for confounding variables such as family history, birth weight, sibling development, and genetic predisposition (17). Current evidence, as emphasized by the Turkish Society of Gynecology and Obstetrics, suggests that the use of NSAIDs during pregnancy is safe and that these drugs can be used at the lowest effective dose, for the shortest duration, and under a doctor's recommendation. Ongoing debates do not provide scientific evidence sufficient to change existing clinical practices (7).

The ongoing debate regarding the use of NSAIDs during pregnancy can be evaluated in terms of limited scientific data, stakeholders' emotional investment in this issue, and public policies (8,18). The ongoing debate highlights the importance of developing scientific literacy among the general public and public administrators, planning public policies based on scientific data, and the need for independent, unbiased scientific rigor (8,17,18). From this perspective, inquiry-based, learner-centered learning, scientific methods, causal reasoning, probability, uncertainty, cognitive errors and biases, and critical thinking should be included among the fundamental steps of basic social education (19). Public administrators should align their policies with scientific principles and avoid the trap of populism (20). Scientists, on the other hand, can add their research protocols and analysis plans to pre-registration platforms, increase data sharing with their peers, and support the dissemination of their scientific findings through various platforms by summarizing them in a way that the public can understand (8, 18). The ability of scientists to conduct scientific research independently of political direction and pressure will increase the reliability of the data obtained (8). It should also be noted that the listed recommendations can be replicated and their effects can only be evaluated in the medium to long term.

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The impact of the pandemic on completed suicides: A psychological autopsy study

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SUMMARY

Objective: The aim of this study was to examine the impact of the COVID-19 pandemic on completed suicides in Konya, Türkiye, using the psychological autopsy method, and to compare pre- and pandemic cases across demographics, risk factors, and associated causes.

Method: This cross-sectional, retrospective case-control study included all completed suicides in Konya, Türkiye, between March 11, 2018, and March 11, 2022. Cases after March 11, 2020, were classified as pandemic. Within the scope of the psychological autopsy method, data were collected from autopsy reports, prosecutor investigation files, medical records, suicide notes, and structured interviews with relatives the deceased. Statistical analyses were conducted using R software (version 4.4.2).

Results: During the pandemic, the incidence rate of completed suicides increased by 25%. No significant differences in age or gender distribution were identified; however, the proportion of university graduates was higher in the pandemic group. The overall prevalence of psychiatric disorders and untreated cases increased significantly during the pandemic. Gambling-related debts and substance-related and addictive disorders were found to be more frequent. Firearm suicides showed a non-significant upward trend. Help-seeking before suicide decreased significantly. Most pandemic cases had sleep disturbances (56.93%) and financial loss (44.93%).

Discussion: The pandemic period increased the risks associated with suicidal behavior and accentuated context-specific vulnerabilities. The findings indicate that psychiatric patients may be more vulnerable during crises and underscore the importance of support services. Accordingly, strengthening financial support, restricting access to online gambling, and expanding psychoeducational interventions are recommended as priority preventive strategies.

Key Words: Pandemic, Psychological Autopsy, Completed Suicide, COVID-19, Suicide

INTRODUCTION

The COVID-19 pandemic was a global crisis that profoundly affected not only physical but also mental health (1). Quarantine, social distancing, and economic uncertainty undermined psychological well-being (2,3). During this period, socially disadvantaged individuals were particularly vulnerable, as social isolation, contagion fears, unemployment, and difficulty accessing basic needs created fertile ground for mental disorders (4,5).

Numerous studies reported substantial increases in depression, anxiety, post-traumatic stress, obsessive-compulsive symptoms, and sleep disturbances during the pandemic (6,7). According to the World Health Organization (WHO), the global prevalence of depression and anxiety rose by approximately 25% during this period (1). This increase was pronounced among young adults, attributed to prolonged isolation, economic uncertainty, and concerns about health and safety (8). Reports indicate that in 2020 alone, the prevalence of anxiety disorders rose by 26%, largely driven by fear of infection, financial strain, and decreased social support systems (9). Vulnerable groups—women, people with low socioeconomic status, and those with prior psychiatric illness—were disproportionately affected (10,11). A study in Türkiye found that 44.6% of pregnant women attending antenatal services during the pandemic showed significant

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anxiety, mainly due to childbirth fears and COVID-19 mortality concerns (12). Furthermore, pandemic-related stressors were associated with a 25% increase in schizophrenia cases (13). The psychological effects of COVID-19 extended beyond the acute phase, with ongoing depression, anxiety, suicidal ideation, persistent fatigue, and cognitive disturbances (14,15).

Suicide is a serious but largely preventable public health issue worldwide. According to the WHO, approximately 720,000 people die by suicide each year, accounting for 1.3% of global mortality (1,16,17). Suicidal behavior is not solely linked to biological or psychiatric factors but is associated with a wide range of risk factors, including social isolation, economic hardship, trauma, substance use, and lack of social support (18,19). Psychiatric disorders are among the primary determinants of suicide, with depression, bipolar disorder, and substance use disorders constituting the highest-risk groups (20,21). The COVID-19 pandemic introduced new and complex risk factors for suicidal behavior. Thus, in addition to stressors such as social isolation, financial uncertainty, unemployment, and fear of illness and death, disruptions in healthcare access and insufficient psychosocial support negatively impacted resilience (22,23). Stigmatization, marginalization, and blame directed toward those perceived as infected also emerged as additional risk factors (24,25).

Studies from various countries have yielded conflicting findings on whether there was any increase in suicide rates during the pandemic. Thus, increased suicide rates were reported in countries such as Japan, South Korea, and the United States, while no significant change was reported in countries like Canada, Germany, and Chile (26,27,28). These discrepancies suggest that the impact of the pandemic on suicide may vary across countries depending on structural factors such as the capacity of the healthcare system, level of social support, and financial security.

In Türkiye, there is still a lack of comprehensive, multidimensional research examining completed suicides during the COVID-19 period. Therefore, the present study aimed to evaluate the effects of the pandemic on suicide cases in Konya. We analyzed individuals aged 18 years and older who died by suicide during the two years following the first confirmed national case (March 11, 2020–March 11, 2022) and compared them with those from the preceding two years (March 11, 2018–March 11, 2020).

To achieve this, we employed the psychological autopsy method—an approach rarely used in Türkiye—which integrates interviews with relatives, and reviews of medical and legal records to investigate demographic and psychosocial factors related to suicide (29,30). This study offers novel insights by applying this method on a large scale to identify context-specific risk factors that emerged under pandemic conditions.

Based on previous literature and the multifactorial nature of suicidal behavior, we hypothesized that the incidence of completed suicides increased during the COVID-19 pandemic compared to the pre-pandemic period, that the prevalence of psychiatric disorders—particularly substance-related and addictive disorders—was higher among individuals who died by suicide during this time, and that pandemic-related psychosocial stressors such as financial loss, bereavement, and sleep disturbances were significantly associated with an elevated risk of suicide.

METHODS

Study Design and Sample

This cross-sectional, retrospective case-control study included all completed suicides among individuals aged ≥18 years in Konya between March 11, 2018, and March 11, 2022, categorized as pre-pandemic (March 11, 2018–March 10, 2020) and pandemic (March 11, 2020–March 11, 2022). Comparative analyses were conducted between these two periods for demographic, psychosocial, and suicide-related variables. The cases were assessed using autopsy reports, investigation files, medical records, forensic documents, and interviews with the available relatives. Exclusion criteria entailed deaths that occurred outside Konya province, non-suicidal deaths (e.g., accidents, natu-

ral causes, homicide), and suicides conducted by individuals who were aged below 18 years. Ethical approval was obtained from the institutional ethics committee (blinded), with additional permissions from forensic and legal authorities (blinded). Procedures complied with ethical standards and the Declaration of Helsinki.

Study Procedure

The study was conducted at the relevant academic department (blinded). Data were collected between November 2023 and October 2024. Comprehensive data on demographics, family history, suicide-related factors, and pandemic impact were collected for eligible cases. The suicide-related investigation files were reviewed, including any suicide notes, witness statements, and pre-death criminal investigation findings. Contact details of the identity witnesses listed in the autopsy reports were used to conduct structured telephone interviews. Before each interview, verbal informed consent was obtained from the first-degree relatives. Additionally, medical records, death certificates, and available suicide notes were examined in detail.

Data Collection Tools

Sociodemographic Data Forms – 1 and 2: Data on completed suicides before and during the pandemic were gathered via interviews with first-degree relatives using two semi-structured forms (pandemic: 30, pre-pandemic: 25 questions). Both forms covered sociodemographic data, personal and family psychiatric history, prior suicide attempts, and suicide-related variables (e.g., method, suicide note, help-seeking behavior, recent medical visits), as well as financial factors such as income level, financial difficulties, and outstanding debts. The pandemic-period form also included COVID-19-related variables (infection, financial losses, changes in sleep patterns, participation in remote work/education).

Secondary Data Sources: Additional data were gathered from official forensic and medical sources, including autopsy reports, prosecution files, and medical records, under appropriate institutional and legal permissions. Medical data were accessed through authorized hospital archives and official record systems, including information on chronic diseases, previously documented psychiatric conditions, treatment history, and hospitalizations. Autopsy reports provided the cause of death, toxicology results, and physical findings (e.g., scars, tattoos, signs of malignancy). Prosecutor's files detailed the incident (time, method, and location), suicide notes, physical evidence, and witness or family testimonies, along with criminal and psychiatric histories.

Analysis of Suicide Notes: All available suicide notes—handwritten, digital, or social media—were examined to identify reasons for suicide, life context, and emotional state. They also helped determine whether the act was premeditated or impulsive and reveal contributing psychological and social factors.

Statistical Analysis

Means and standard deviations were calculated for the continuous variables, while frequencies and percentages were determined for categorical variables. Chi-square and Fisher's exact tests were used for analyzing categorical variables, and t-tests were applied for continuous variables. All analyses were carried out using R software version 4.4.2 (R Core Team, 2024), and statistical significance was set at $p < 0.05$.

RESULTS

Among 178 pre-pandemic and 222 pandemic cases, exclusions of non-suicidal deaths (13 and 10) and those under 18 years (4 and 7) resulted in 161 and 205 cases, respectively. Based on Konya population data, suicide incidence rose from 7.26 to 9.06 per 100,000 during the pandemic, a 25% increase (Incidence Rate Ratio [IRR]: 1.25, 95% Confidence Interval [CI]: 1.02–1.54, $p = 0.035$). Six-month interval analyses showed stable distributions in both periods ($p > 0.90$).

No significant differences were found in age, gender, marital status, children/siblings, employment,

Table 1. Comparison of Sociodemographic Characteristics and the Relationship Between Debt and Gambling in Completed Suicides Before and During the Pandemic

Variables	Pre-Pandemic Period	Pandemic Period	p-value
	(n=161)	*(n=205)*	
Age (years, mean – SD)	39.87–17.01	39.74–16.45	>0.9
Gender			0.7
Male	121 (75.16%)	158 (77.07%)	
Female	40 (24.84%)	47 (22.93%)	
Marital Status			0.9
Married	76 (53.15%)	89 (52.98%)	
Single	43 (30.07%)	54 (32.14%)	
Widowed	24 (16.78%)	25 (14.88%)	
Number of children (mean – SD)	1.60–1.62	1.56–1.68	0.8
Number of siblings (mean – SD)	4.01–1.94	4.17–1.85	0.5
Educational Status			0.001
Primary school graduate	69 (55.65%)	85 (61.15%)	
High school graduate	51 (41.13%)	35 (25.18%)	
University graduate	4 (3.23%)	19 (13.67%)	
Occupation			0.4
Worker	29 (22.31%)	23 (15.97%)	
Self-employed	24 (18.46%)	31 (21.53%)	
Civil servant	8 (6.15%)	15 (10.42%)	
Retired	14 (10.77%)	19 (13.19%)	
Unemployed	55 (42.31%)	56 (38.89%)	
Living Arrangement			0.5
Living alone	27 (21.60%)	38 (26.39%)	
With family	90 (72.00%)	100 (69.44%)	
With friends/others	8 (6.40%)	6 (4.17%)	
Income Level			>0.9
Low	42 (34.15%)	45 (32.61%)	
Middle	69 (56.10%)	79 (57.25%)	
High	12 (9.76%)	14 (10.14%)	
Debt Status			0.2
No	93 (73.23%)	95 (66.43%)	
Yes	34 (26.77%)	48 (33.57%)	
Gambling-related Debt			0.006
No	122 (99.19%)	126 (91.97%)	
Yes	1 (0.81%)	11 (8.03%)	

Note. Values are presented as n (%) for categorical variables and mean – standard deviation for continuous variables.
Statistical comparisons were performed using Pearsons Chi-squared test, Welchs two-sample t-test, or Fishers exact test.

cohabitation, occupational groups or income ($p > 0.05$, Table 1). In contrast, university graduates ($p = 0.001$) and online gambling-related debts ($p = 0.006$) were more frequent during the pandemic. Debt distribution by income did not differ ($p = 0.400$ pre-pandemic, $p = 0.059$ pandemic).

No significant differences were found in comorbid medical conditions, surgery history, tobacco, alcohol or substance use, relationship problems, or family psychiatric/suicide history between periods ($p > 0.05$, Table 2).

All cases were evaluated for psychiatric history (diagnoses, treatment, hospitalization, prior suicide attempts; Table 3). Diagnoses, including mood, anxiety, psychotic, and substance/alcohol-related disorders, were formally established and documented in official medical or forensic records. In contrast, none of the individuals classified under gambling-related disorders had a formal diagnosis; these cases were identified through detailed interviews with first-degree relatives and corroborating social or legal information. In accordance with the psychological autopsy approach, such evaluations were used to describe probable psychiatric characteristics rather than to assign formal diagnoses. A psychiatrist reviewed these cases and classified them as probable gambling-related disorder based on behavioral patterns consistent with the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria. Cases were grouped into five DSM-5 categories: mood, anxiety, psychotic, substance/alcohol/gambling-related, and other. Documented or probable psychiatric disorder was more frequent during the pandemic (67.36%) than before (55.56%, $p = 0.046$). Mood disorders were most common in both periods, while substance/alcohol/gambling-related disorders were higher during the pandemic (5.51% vs. 17.65%). The overall diagnostic distribution differed significantly ($p = 0.022$).

Treatment history was categorized as: (1) no disorder/treatment, (2) disorder without treatment, (3) individuals with disorder but no regular treatment

Table 2. Comparison of Pre-Pandemic and Pandemic Suicide Cases in Terms of Personal and Family History Characteristics

Variables	Pre-Pandemic Period	Pandemic Period	p-value
	(n=161)	*(n=205)*	
Medical history			0.5
None	86 (66.67%)	104 (73.24%)	
Chronic illness	26 (20.16%)	21 (14.79%)	
Neurological disorder	12 (9.30%)	10 (7.04%)	
Malignancy	5 (3.88%)	7 (4.93%)	
Surgical history			>0.9
None	91 (72.80%)	99 (72.26%)	
Present	34 (27.20%)	38 (27.74%)	
Habits			0.4
None	54 (43.55%)	52 (36.36%)	
Smoking	34 (27.42%)	42 (29.37%)	
Alcohol and smoking	27 (21.77%)	31 (21.68%)	
Alcohol, smoking, substance	9 (7.26%)	18 (12.59%)	
Marital/relationship problems			0.6
None	78 (61.42%)	86 (58.11%)	
Present	49 (38.58%)	62 (41.89%)	
History of criminal offense			0.7
None	104 (%84.55)	137 (%82.48)	
Present	19 (15.45%)	24 (17.52%)	
History of trauma			0.6
None	100 (80.65%)	115 (83.33%)	
Present	24 (19.35%)	23 (16.67%)	
Witnessed suicide			0.3
None	114 (92.68%)	122 (89.05%)	
Present	9 (7.32%)	15 (10.95%)	
Family history of psychiatric disorder			0.7
None	100 (81.30%)	114 (83.21%)	
Present	23 (18.70%)	23 (16.79%)	
Family history of suicide			0.3
None	116 (95.08%)	126 (91.97%)	
Present	6(4.92%)	11 (8.03%)	

Note. Values are presented as n (%) for categorical variables. Statistical comparisons were performed using Pearsons Chi-squared test or Fishers exact test.

in the past six months, and (4) individuals receiving regular psychiatric treatment. Pre-pandemic proportions were 44.09%, 13.39%, 21.26%, and 21.26%, respectively, compared to 31.97%, 28.57%, 14.97%, and 24.49% during the pandemic. This difference was significant ($p = 0.008$).

Findings on psychiatric history, treatment, and prior attempts are in Table 3. Psychiatric hospitalization was significantly more common in the pandemic group ($p = 0.046$). However, no significant differences were found between the periods in psychiatric consultations within the last month ($p = 0.400$), number of prior suicide attempts ($p = 0.800$), or methods used ($p = 0.600$).

Methods were grouped as hanging, firearm, jumping, chemical ingestion, and sharp injuries (Table 4). The use of firearms showed an increase during the pandemic approaching statistical significance ($p = 0.052$). The proportions of suicidal ideation (28% pre-pandemic, 34.2% pandemic) and suicide notes (26.09% pre-pandemic, 21.77% pandemic) did not differ significantly ($p = 0.2$ and $p = 0.4$). Help-seeking declined significantly, from 14.63% to 6.43% ($p = 0.029$).

To better understand the contextual factors contributing to completed suicides during the pandemic, the cases were examined in relation to stressors such as financial loss, bereavement, COVID-19 infection, sleep disturbances, and experiences with remote education or working from home. Among pandemic-period cases with financial loss, 95.16% were male and 68.85% had debt ($p < 0.001$), with no significant differences in age, marital status, income, or psychiatric disorder ($p > 0.05$ for all). Among pandemic-period cases, bereavement was reported in 18.98%; psychiatric disorders were significantly more prevalent in this group (88.46%) compared to those without bereavement (64.86%) ($p = 0.019$). Other variables, including age, gender, marital status, and household composition, did not differ significantly between the two groups ($p > 0.1$ for all). Among pandemic-period cases, 65.47% had no history of COVID-19 infection, 29.50% had non-hospitalized infections, and 5.04% had infections requiring hospitalization. In

Table 3. Comparison of Pre-Pandemic and Pandemic Completed Suicide Cases in Terms of Psychiatric Diagnoses, Treatment History, and Previous Suicide Attempts

Variables	Pre-Pandemic Period *(n=161)*	Pandemic Period *(n=205)*	p-value
Psychiatric disorder (overall)			0.046
None	56 (44.44%)	47 (32.64%)	
Present	70 (55.56%)	97 (67.36%)	
Type of psychiatric disorder			0.022
None	56 (44.09%)	47 (30.72%)	
Mood disorder	37 (29.13%)	53 (34.64%)	
Anxiety disorder	7 (5.51%)	7 (4.58%)	
Psychotic disorder	11 (8.66%)	10 (6.54%)	
Substance-related and addictive disorders	7 (5.51%)	27 (17.65%)	
Other psychiatric disorders	9 (7.09%)	9 (5.88%)	
Duration of psychiatric disorder (months)	36.14–46.67	29.02–32.25	0.3
Psychiatric disorder and treatment status			0.008
No disorder; no treatment	56 (44.09%)	47 (31.97%)	
Disorder present; never treated	17 (13.39%)	42 (28.57%)	
Disorder present; no treatment in past 6 months	27 (21.26%)	22 (14.97%)	
Disorder present; receiving regular treatment	27 (21.26%)	36 (24.49%)	
History of psychiatric hospitalization			0.046
No disorder, no hospitalization	56 (44.44%)	47 (32.41%)	
Disorder present; no hospitalization	56 (44.44%)	66 (45.52%)	
Disorder present; 1 hospitalization	11 (8.73%)	21 (14.48%)	
Disorder present; >1 hospitalization	3 (2.38%)	11 (7.59%)	
Mental health service use in last month			0.4
No	88 (71.54%)	91 (66.42%)	
Yes	35 (28.46%)	46 (33.58%)	
Number of previous suicide attempts			0.8
None	101 (80.80%)	112 (78.87%)	
One	19 (15.20%)	22 (15.49%)	
More than one	5 (4.00%)	8 (5.63%)	
Method of previous suicide attempts			0.6
None	101 (80.80%)	113 (80.14%)	
Non-violent	11 (8.80%)	17 (12.06%)	
Violent	13 (10.40%)	11 (7.80%)	

Note. Values are presented as n (%) for categorical variables and as mean – standard deviation (SD) for continuous variables. Statistical comparisons were performed using Pearsons Chi-squared test, Welchs t-test, or Fishers exact test.

the pandemic group, 12.41% (n = 17) of the cases were engaged in remote education or work. Changes in sleep patterns were observed in 56.93% of the cases, specifically emerging during the pandemic, and included insomnia, hypersomnia, and circadian rhythm disorders. Remote education or working from home was significantly more common among those with disrupted sleep ($p = 0.005$). Psychiatric disorders were also more prevalent in sleep-disrupted group compared to the non sleep-disrupted group (87.18% vs. 45.76%, $p < 0.001$).

A subset of the pandemic-period cases involved individuals with gambling-related debt (n = 11), which offered further insight into the profiles of the high-risk cases. Among these 11 cases, all were male with a mean age of 36.82 years, and all debts were incurred through online platforms. 54.55% were married, 45.45% held a university degree, 36.36% were civil servants, and 72.73% were middle-income. Considering their psychiatric diagnoses, 90.91% had substance-related and addictive disorders (alcohol, drugs, gambling) and only one case (9.09%) involved a mood disorder; 90.91% had no history of psychiatric treatment. Prior suicide attempts occurred in 27.27% of cases, most often by hanging (63.64%), and suicide notes were found in 54.55%. Pandemic-related stressors were also more common in these specific cases: 90.91% reported financial loss, 27.27% had experienced bereavement, 81.82% had sleep disturbances, and 18.18% reported having to work or receive education remotely.

DISCUSSION

The COVID-19 pandemic profoundly disrupted daily life, healthcare access, and psychological well-being, likely reshaping the complex biopsychosocial structure of suicidal behavior. The current study aimed to compare completed suicides in Konya, Türkiye before and during the pandemic, using psychological autopsy alongside forensic and medical data to identify both general and pandemic-related risk factors within a broader psychosocial context. Consistent with our initial hypotheses, we expected to observe an increase in suicide incidence, a higher prevalence of psychiatric and addictive disorders, and the influence of pandemic-specific stressors such as financial loss, bereavement, and sleep dis-

Table 4. Comparison of Suicide Characteristics Between the Pre-pandemic and Pandemic Periods

Variables	Pre-Pandemic Period *(n=161)*	Pandemic Period *(n=205)*	p-value
Suicide method			0.052
Hanging	90 (55.90%)	90 (43.90%)	
Firearm	38 (23.60%)	65 (31.71%)	
Jumping from height	22 (13.66%)	36 (17.56%)	
Chemical method	11 (6.83%)	10 (4.88%)	
Sharp object	0 (0.00%)	4 (1.95%)	
Suicidal ideation/plan			0.2
Absent	90 (72.00%)	94 (65.28%)	
Present	35 (28.00%)	50 (34.72%)	
Help-seeking behavior			0.029
Absent	105 (85.37%)	131 (93.57%)	
Present	18 (14.63%)	9 (6.43%)	
Suicide note			0.4
Absent	97 (78.23%)	102 (73.91%)	
Present	27 (21.77%)	36 (26.09%)	

Note. Values are presented as n (%) for categorical variables.
Statistical comparisons were performed using Pearsons Chi-squared test or Fishers exact test.

turbance. Based on our findings, suicide incidence rate in Konya was 25% higher during the pandemic than in the pre-pandemic period, though rates remained unchanged in the first six months under strict lockdowns. Literature shows regional and temporal variability in suicide rates during the pandemic. Two meta-analyses indicated that suicide rates during the pandemic generally remained stable or declined (31,32). Declines were also observed in Germany during the early restriction phase (33), and no increase was reported in the UK after the national lockdown (34). Similarly, high- and upper-middle-income countries reported stable or reduced counts in the early months (35). By contrast, increases were documented in Hungary (36), while in Japan suicides rose particularly among women and younger individuals (37), and in Nepal a general increase was observed (38). In St. Petersburg, rates declined in the first month but rose in subsequent months, especially among young people (39). These discrepancies may reflect differences in how pandemic-related restrictions and socioeconomic burdens affected mental health across countries with varying income levels.

In our study, the mean age of suicide cases remained stable across periods, consistent with national data showing peak prevalence in young adults in Türkiye (40), Most cases were male, supporting evidence that men more often complete suicide despite higher attempt rates among women (41). Although marriage is generally considered protective (42,43,44,45), more than half of cases were married, a pattern also reported in a Turkish psychological autopsy study (46). Educational level differed, with more university graduates during the pandemic, possibly reflecting greater vulnerability of educated individuals in economic uncertainty (47). Cohabitation status did not change, though living alone increased modestly, a known risk factor due to social isolation (48). Occupational status showed mild, non-significant differences: more public servants, more self-employed, and fewer manual laborers during the pandemic. However, in our study the persistently high unemployment rate across both periods underscores the role of joblessness and loss of financial independence in suicide risk, reflecting the unequal socioeconomic impact of the pandemic across occupational groups.

A well-documented link exists between financial debt and suicide risk (49). In our study, overall debt did not differ significantly, but gambling-related debt was notably higher during the pandemic. Gambling increases suicide risk through financial strain, shame, and co-occurring psychiatric or personality problems (50-53). All gambling debts identified in the current study were acquired via online platforms, suggesting that quarantine conditions and social isolation may have contributed to increased online gambling. Our interpretation is supported by recent research showing a shift from physical to online gambling during the pandemic. Increased participation in online casinos, sports betting, and skill-based games during the pandemic has been reported (54). Moreover, studies from Poland and the UK identified spikes in online gambling frequency and search trends for games like poker and slots (55,56). Unstructured free time and flexible work schedules most likely intensified engagement with short-term reward behaviors such as gambling, which in turn may have contributed to broader patterns of internet-related addictions (57,58).

Our study revealed a significant increase in psychiatric disorders during the pandemic, consistent with reports of more widespread and severe mental health symptoms (7,59). A Romanian psychological autopsy similarly linked severe depression and anxiety to suicide risk (60). Mood disorders were most frequent in both periods, but substance-related and addictive disorders—including alcohol, drug, and gambling use—rose sharply, becoming the second most common diagnosis during the pandemic. In contrast, anxiety and psychotic disorders showed no change between periods. Alcohol use is consistently linked to suicide risk (61), with studies showing that heightened consumption, especially binge drinking, was associated with suicidal ideation during the pandemic (62,63,64,65). Pandemic stressors such as social isolation and uncertainty further exacerbated substance use and behavioral addictions (66,67).

Another notable finding was that although more individuals received psychiatric diagnoses during the pandemic, many lacked access to treatment, likely due to isolation, stigma, and disrupted care. This aligns with reports of reduced psychiatric service use early in the pandemic (68,69). Psychiatric diagnoses with multiple prior hospitalizations were also more common, suggesting greater disorder severity, reduced care access, and limited social support during the pandemic.

A prior suicide attempt is a robust predictor of suicide completion (70); however, in our study the prevalence and methods did not differ between periods. Hanging remained the most common method in both periods, consistent with national data from Türkiye (71). We observed an increase in firearm use during the pandemic, suggesting a potential shift in the preferred method, although this trend did not reach statistical significance. Firearms are among the most lethal suicide methods, and their household availability significantly elevates risk (72,73). Increased firearm purchases during the COVID-19 pandemic in the U.S. (74,75) and recent reports of rising unregistered firearm possession in Türkiye (76) suggest that increased personal firearm ownership during this period may have contributed to greater firearm involvement in suicides.

Suicidal ideation and note frequency showed no period differences. In contrast, help-seeking behaviors prior to or immediately following the act declined significantly during the pandemic. This decrease may reflect the compounding effects of increased social isolation, reduced interpersonal contact, limited access to psychiatric care, and intensified psychological distress. It is also possible that a heightened intent to die may have decreased the likelihood of reaching out for help.

We also evaluated the pandemic-period suicide cases with respect to variables such as financial loss, bereavement, COVID-19 infection, disrupted sleep patterns, and remote work/education. The exacerbation of global economic pressures during the COVID-19 pandemic is well-established, which in turn may have affected suicide rates (77,78). Studies confirm that financial difficulties during this period contributed to suicidal behavior (79–81). In our study, financial loss was frequently linked to suicide during the pandemic, predominantly among men, aligning with literature showing that economic crises heighten male suicide risk (82).

During the pandemic, many individuals lost loved ones to COVID-19 or other causes, and disruptions in cultural and religious mourning rituals, as well as the inability to say goodbye in person, were shown to hinder healthy grieving processes (83). We observed that individuals who died by suicide during the pandemic often had recent bereavement, with psychiatric disorders more common in this group, suggesting greater vulnerability to bereavement among those with mental disorder.

Sleep disturbances were highly prevalent during the COVID-19 pandemic, with notable increases in insomnia, hypersomnia, and circadian rhythm disorders (84,85). In our study, many individuals who died by suicide experienced such disturbances, most of whom also had psychiatric disorder. These findings underscore the strong link between sleep disturbances and suicide risk, especially among individuals with psychiatric disorders.

We also examined the influence of pandemic-related lifestyle changes such as remote work and online education on suicide risk. Prior studies suggest these changes may foster isolation, sleep prob-

lems, and greater suicidality, especially among students (86,87). In our study, few suicide cases involved remote work or education, likely reflecting the limited presence of students or white-collar workers in the sample. Nonetheless, lifestyle changes during the pandemic, particularly the shift to remote modalities, have been linked to increased sleep disturbances. A study from India reported greater daytime sleepiness and longer sleep duration among those working or studying remotely (88), and our findings similarly indicated more frequent sleep disruption among individuals engaged in remote work or education.

Unlike most previous investigations that relied primarily on registry or epidemiological data, this study employed a comprehensive psychological autopsy integrating forensic, medical, and psychosocial sources. Only a limited number of studies in Türkiye have examined suicide during the COVID-19 pandemic—among them, a single case report (89) and a provincial retrospective analysis based solely on forensic records (71). These studies provided valuable preliminary insights but remained limited in scope and methodology. According to the available literature, the present research represents one of the first large-scale, multidimensional investigations in Türkiye comparing suicides before and during the pandemic through a psychological autopsy framework that integrates family interviews with official forensic and medical documentation. This approach identified pandemic-specific stressors—financial loss, bereavement, sleep disturbance, and online gambling—not captured in registry data. Although the association between pandemics and suicide remains uncertain, international organizations emphasize the long-term mental health consequences of COVID-19 and the urgent need for preventive strategies (90,91). By addressing this gap, our study contributes novel, context-specific evidence to the global literature on suicide risk during crises.

This study has several limitations. Identifying suicides is inherently difficult, and underreporting or misclassification may have excluded some, particularly firearm or overdose cases with unclear intent. Psychiatric evaluations before death were often unavailable, limiting analyses, and relatives' accounts may involve recall bias. Moreover, post-pandemic and longitudinal data are needed to clarify long-term trends. Despite these limitations, the integration of psychological autopsy with forensic, medical, and psychosocial data across multiple years provides valuable insight into suicide risk during a global crisis. Future studies should build on this framework through multicenter, prospective designs and include standardized psychiatric assessments to enhance reliability and generalizability.

The COVID-19 pandemic not only increased the suicide incidence in Konya, Türkiye, but also reshaped the psychosocial risk landscape. Financial losses, gambling-related debt, untreated psychiatric disorder, and sleep disturbances emerged as major contributors, while help-seeking declined. Substance-related and addictive disorders, particularly online gambling, rose sharply. Remote work and education played only a minor role. Overall, the pandemic both intensified established risks and highlighted emerging vulnerabilities, such as online gambling and economic instability. Accordingly, strengthening financial support, restricting access to online gambling, and expanding psychoeducational interventions are recommended as key preventive strategies.

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Six-month follow-up study of patients attending the disaster psychiatry outpatient clinic: Depression, anxiety, stress, and psychological resilience

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SUMMARY

Objective: Earthquakes and their consequences are associated with social, economical, and psychological difficulties. This study aimed to evaluate the psychological stress and psychological resilience levels of people who applied to Eskişehir Osmangazi University Disaster Psychiatry Outpatient Clinic (DPOC) 6 months after the February 6, 2023 earthquakes and to review the predictors.

Method: In the first phase of the study, the sociodemographic and clinical data form records applied to the individuals who applied to DPOC were retrospectively evaluated. In the second phase of the study, the participants were applied the Depression Anxiety Stress-21 Scale (DASS-21) and the Brief Psychological Resilience Scale (BRS) 6 months after the earthquake.

Results: In the first phase of the research, 68 people were included and 42 of them participated in the second phase. In the 6th month of the disaster, 59.5% of the participants scored moderate or higher on the depression subscale, 42.9% on the anxiety scale, and 31% on the stress scale. Clinical Global Impression Scale (CGI) scores during the first evaluation correlated with the anxiety subscale score, total DASS-21 score. CGI score at the first application was negatively related to resilience score in follow-up. BRS score was negatively correlated with total DASS-21 score.

Discussion: Providing psychosocial support in the post-disaster period is important to prevent mental disorders and increase psychological resilience. Also, identifying risky groups and monitoring the follow-up and treatment processes of these individuals is an important factor to reduce the associated morbidity.

Key Words: Disasters, earthquakes, mental health services, psychological distress, resilience

INTRODUCTION

On February 6, 2023, earthquakes of magnitudes 7.7 and 7.6 struck the Pazarcık and Elbistan districts of Kahramanmara Province. The earthquake disaster affected millions of people, resulting in over 50,000 casualties and over 100,000 physical injuries, according to official figures (1). Due to the lack of affordable accommodation following the earthquake, many people were forced to stay in tents and containers. Some people who had relatives in provinces unaffected by the earthquake migrated to live with them or stayed in various places, such as dormitories and hotels, for the short or long term through state and social aid organizations. Natural disasters such as earthquakes and their consequences are associated with social, economic, and psychological difficulties (2, 3).

Although posttraumatic stress disorder is a well-known diagnosis after disasters, the psychological difficulties after traumatic events are not limited to this diagnosis (4). Following traumatic events such as natural disasters, people may experience many reactions, such as anxiety, depression, dissociation, shock, and agitation (5). After the 7.0 magnitude earthquake in Haiti in 2010, it was stated that more than one-fourth of the earthquake survivors had

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severe posttraumatic stress disorder (PTSD) symptoms, one-third had severe depression symptoms, and one-fifth had severe anxiety symptoms (6). Researchers also focused on those who do not suffer from mentally ill health after the disasters. Psychological resilience is defined as the ability to remain well despite negative experiences and maintain functionality despite stress and difficulties and is associated with positive mental health outcomes (7).

Psychological first aid may be considered a specific crisis-focused disaster mental health intervention during and after disasters (8). It is effective in reducing anxiety, and there is supporting evidence of its efficiency in reducing depression and posttraumatic stress disorder and improving resilience (9). Designed to stabilize and alleviate acute distress related to disaster experiences, psychological first aid requires an empathetic relationship and a sense of trust (8).

After the February 6, 2023, earthquakes, as the earthquake region lacked safe shelters and basic needs, survivors traveled to other cities, near or far. They applied to mental health services in the cities where they arrived. At that time, the mental health professionals who served in the hospitals faced an important obstacle regarding the healthcare system: Psychiatry outpatient clinic examinations were being scheduled approximately every 15 minutes. The routine mental healthcare services contradicted psychological first aid principles that focus on empathetic and compassionate care. That gap was filled with disaster psychiatry outpatient clinics in many institutions, either face-to-face or online. After the acute period, those disaster psychiatry outpatient clinics were closed and integrated into routine mental health services. That did not allow a longitudinal follow-up of the disaster survivors.

On the other hand, literature states that adverse mental health outcomes are not limited to the acute phase: After the 2015 earthquake in Nepal, it is stated that the frequency of anxiety symptoms, depressive symptoms, and posttraumatic stress disorder symptoms is high even one year later in people exposed to the earthquake (10). The effects of natural disasters, such as earthquakes, on people's mental health can last for many years (11). Therefore, it is important to provide early diagnosis, follow-up, and psychosocial support after natural disasters (12).

The aims of this study are stated below:

1- To retrospectively examine the sociodemographic and clinical characteristics of the cases who applied to the Eskisehir Osmangazi University Faculty of Medicine Disaster Psychiatry Outpatient Clinic after the Kahramanmara 2023 earthquakes.

2. Monitor the applicants' psychological distress and resilience levels six months after the disaster to determine their levels.

3- Examining the relationship between psychological stress and psychological resilience in the post-disaster period and baseline clinical evaluation.

METHODS

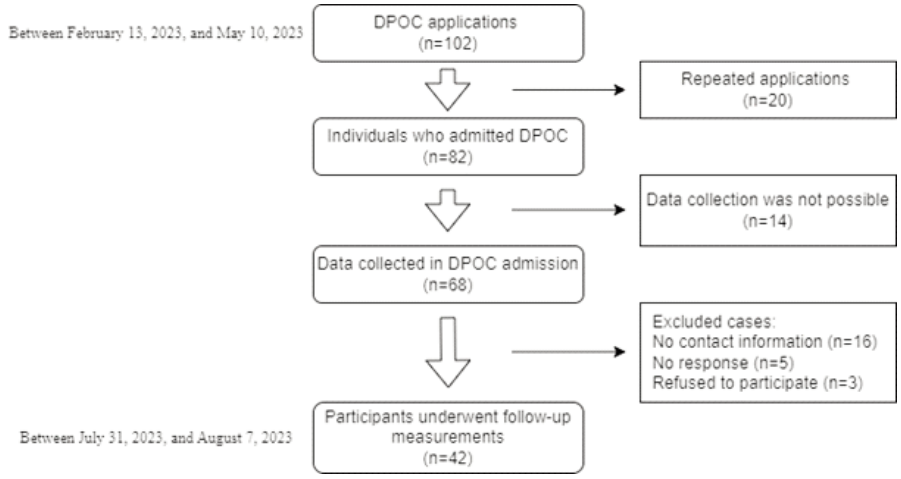
Ethical approval

This study was approved by the Eskisehir Osmangazi University Non-invasive Clinical Research Ethics Committee on 25.07.2023 with decision number 09. The research was conducted in accordance with the principles of the Declaration of Helsinki.

Study design

The present study consisted of two phases. The first phase was retrospective, and the second phase was cross-sectional. All participants were applicants of the Disaster Psychiatry Outpatient Clinic (DPOC) of Eskisehir Osmangazi University Faculty of Medicine. DPOC was established on February 13, 2023. Its purpose was to provide psychological first aid to people affected by the February 6, 2023 earthquakes. DPOC worked without an appointment; no fixed interval was determined for meeting times, and psychological support was provided according to the person's needs. Psychiatry residents and psychologists worked at the DPOC

Figure 1: The flowchart diagram of the research process



under the supervision of faculty members, applying standardized forms to the applicants. As the number of applications decreased and it was understood that these needs had been significantly reduced, the DPOC was closed on May 10, 2023, and integrated into the General Adult Psychiatry Outpatient Clinic.

It is crucial to note that Eskisehir City is nearly 820 kilometers far away from the earthquake center Pazarcık, Kahramanmara . Considering the destructive nature of the disaster, many individuals left the region in search of safe shelters.

Inclusion and exclusion criteria

All individuals aged 18 years or older who applied to the Disaster Psychiatry Outpatient Clinic (DPOC) between February 13 and May 10, 2023, were considered for inclusion in the first phase of the present study. Exclusion criteria were based on clinical judgment during the first phase: Individuals with cognitive impairments (e.g., dementia or intellectual disability) or acute psychiatric presentations that would interfere with survey participation, such as psychotic or manic episodes, were excluded.

For the second phase (the follow-up), participants who could be reached by phone were included. In both phases, participants were required to provide informed consent.

Recruitment process

In the first and retrospective phase of the study, the sociodemographic and clinical characteristics of the cases that applied to DPOC between February 13, 2023, and May 10, 2023, were evaluated. In the cross-sectional phase of the study, the contact numbers of the cases who applied to DPOC were obtained from the hospital automation system. The subjects were contacted through their phone numbers between July 31, 2023, and August 7, 2023. The purpose of the research was explained on the phone call. An online Informed Consent Form was sent to the subjects who agreed. People who approved the submitted online consent form were directed to the research survey by the relevant link. During data collection, the earthquake survivors were asked about their actual needs regarding their mental health. General Adult Psychiatry Outpatient Clinic appointments were scheduled for those suffering from ongoing psychiatric symptoms.

The research design is summarized in Figure 1.

Psychometric evaluation

Sociodemographic and Clinical Data Form: The form was created using the Disaster and Mass Violence Evaluation Form (13). It includes the characteristics that define the person, the nature of the earthquake experience, and the diagnosis and treatment made through clinical interviews. It was routinely applied at DPOC, as recommended by the Psychological Trauma and Disaster Psychiatry Working Unit of the Turkish Psychiatric

Table 1. Sociodemographic characteristics of the participants (n=42)

		Mean	Standard deviation
Age		38.76	16.21
		Frequency	Percent
Sex	Female	32	76.2
	Male	10	23.8
Civil status	Single	22	52.4
	Married	20	47.6
Number of children	None	17	40.5
	1	4	9.5
	2	12	28.6
	3	7	16.7
	4	2	4.8
Educational level	Illiterate	2	4.8
	Primary school	1	2.4
	Secondary school	3	7.1
	High school	21	50
	Collage	11	26.2
	Postgraduate	4	9.5
Employment	Full-time	23	54.8
	Retired	17	40.5
	Unemployed	2	4.8

Association (13). The Clinical Global Impressions Scale (CGI) was included in the form. The CGI assesses disease severity on a scale from 1 to 7 (14). Higher scores indicate increased disease severity.

The following measurements were applied in the second phase of the present study.

Depression Anxiety Stress-21 Scale (DASS-21): The 42-item depression, anxiety, and stress scale developed by Lovibond and Lovibond was reduced to 21 items (2005), and a shortened version was developed (15, 16). The measurement tool, evaluated on a 4-point scale, consists of 7 items each for depression, anxiety, and stress. The internal consistency coefficients of the scale were calculated as 0.91 for depression, 0.84 for anxiety, and 0.90 for the stress dimension. A Turkish adaptation study of the scale was conducted by Sarıçam (17). The internal consistency coefficients of the Turkish form were calculated as 0.92 for depression, 0.86 for anxiety, and 0.88 for the stress dimension. Cut-off points were set as 9/10 for depression, 7/8 for anxiety, and 14/15 for stress following previous research (18).

Brief Psychological Resilience Scale: The scale was developed by Smith and colleagues to measure the psychological resilience of individuals (19). The Brief Psychological Resilience Scale is a 5-point Likert-type, 6-item, self-report measurement tool. High scores indicate high psychological resilience. The validity and reliability study of the scale was conducted by Do an (20).

Statistical analysis

IBM SPSS version 26 was utilized to perform statistical analysis. Categorical data were presented as frequency and percentage. Continuous data were presented as mean and standard deviation. Data were normally distributed. Pearson correlation analysis was performed to reveal the relationships between scale scores. A statistically significant p-value was set at 0.05.

RESULTS

Between February 13, 2023, and May 10, 2023, the Eskisehir Osmangazi University Medical Faculty's DPOC provided support to earthquake survivors. Eighty-two adults applied in that period. Forty-two of them (51.2%) responded and accep-ted to participate in the present study.

Table 1 presents the sociodemographic characteristics of the participants. The mean age was 38.76 ± 16.21. Most participants were female (76.2%), and 59.5% had children. The disaster survivors recruited for the present study had high educational levels, with 85.7% having graduated from high school or higher educational institutions.

Table 2 summarizes the experiences of earthquake survivors. Many participants felt the earthquake

Table 2. Earthquake experiences of the survivors (n=42).

		Frequency	Percent
Felt the earthquake tremor	Yes	39	92.9
	No	3	7.1
Thought they would die	Yes	35	83.3
	No	7	16.7
Wounding of significant others	Yes, immediate family	6	14.3
	Yes, other	22	52.4
	No	14	33.3
Death of significant others	Yes, immediate family	1	2.4
	Yes, other	29	69
	No	12	28.6
The house became unusable	Yes	24	57.1
	No	18	42.9
Trapped under rubble	Yes	0	0
	No	42	100
Participated in search and rescue operations	Yes	9	21.4
	No	33	78.6
Witnessed to the wounding of others	Yes	27	64,3
	No	15	35,7
Witnessed to the death of others	Yes	11	26,2
	No	31	73,8
Being wounded due to the earthquake	Yes	3	7,1
	No	39	92,9
Basic needs such as shelter, clothing, and food were met following the earthquake	Yes	18	42,9
	Partly	8	19,0
	No	16	38,1

Table 3. Psychometric characteristics of the participants 6 months after the earthquakes (n = 42).

		Mean	Standard deviation
DASS-21	Total score	19.23	10.04
	Depression subscale	7.26	4.06
	Anxiety subscale	5.07	3.54
	Stress subscale	6.90	4.16
BRS		18.28	3.83

DASS-21: Depression Anxiety Stress-21 Scale, BRS: Brief Psychological Resilience Scale

tremor (92.9%) and thought they would die (83.3%). Twenty-eight participants (66.7%) had their significant others wounded, while 30 (71.4%) lost relatives or acquaintances. Over half of the study sample had their house unusable after the disaster (57.1%). None of them were trapped under rubble. Several earthquake survivors participated in search and rescue operations (21.4%). Participants witnessed other disaster victims' wounding (64.3%) and death (26.2%). Three participants were wounded due to the earthquake (7.1%). 38.1% of them were unable to meet basic needs such as shelter, clothing, and food following the earthquake.

Before the disaster, 19 participants had a psychiatric disease history: depression (n=9), anxiety disorders (n=8), posttraumatic stress disorder (n=1), attention deficit and hyperactivity disorder (n=1). Twelve participants had physical diseases such as hypertension (n=5), diabetes (n=2), congestive heart failure (n=1), coeliac disease (n=1), asthma (n=1), benign breast tumor (n=1), and trigger finger (n=1).

Fourteen participants (33.3%) reported having experienced one or more traumatic events in the past. Those were the death of loved ones (n=5), domestic violence (n=3), another earthquake (n=3), divorce (n=3), the danger of death (n=1), and severe COVID-19 (n=1). Based on DSM-5 Criterion A for trauma, 7 of these participants (50%) reported experiences that qualify as traumatic, such as domestic violence, life-threatening situations, or exposure to another earthquake. The remaining experiences—including bereavement, divorce, and fear related to COVID-19—do not meet the DSM-5 trauma criteria, although they represent significant stressors. This distinction is crucial for understanding how various types of adverse experiences may be linked to subsequent psychological outcomes.

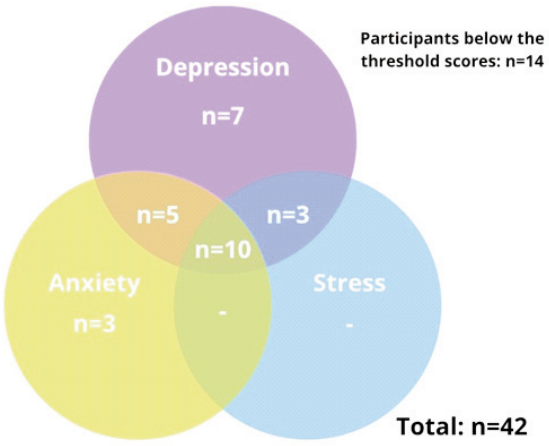


Figure 2: Overlap of depression, anxiety, and stress symptoms at moderate or higher severity (DASS-21)

At the first examination of the DPOC applicants, 28 individuals were diagnosed with a psychiatric disorder. Those diagnoses were acute stress disorder (n=16), anxiety disorders (n=4), posttraumatic stress disorder (n=4), depression (n=3), and adjustment disorders (n=1). CGI score's mean value was 2.40 ± 1.14 (minimum 1, maximum 4). Clinicians found the intervention adequate for 12 cases (28.6%). Thirteen subjects (31%) were informed about possible psychiatric needs and the places to apply in such cases. Three patients (7.1%) were considered risky to develop more severe psychopathology, and psychiatric follow-up was recommended. Seven cases (16.7%) were identified as requiring regular follow-up.

The DPOC applicants were evaluated regarding resilience, depression, anxiety, and stress in the sixth month of the earthquake (See Table 3). The mean value of the resilience score was 18.28 ± 3.83. The total score of the DASS-21 had a mean value of 19.23 ± 10.04, while the mean subscores for depression, anxiety, and stress were 7.26 ± 4.06, 5.07 ± 3.54, and 6.90 ± 4.16, respectively.

Figure 2 illustrates the comorbidity patterns of depression, anxiety, and stress symptoms at mode-

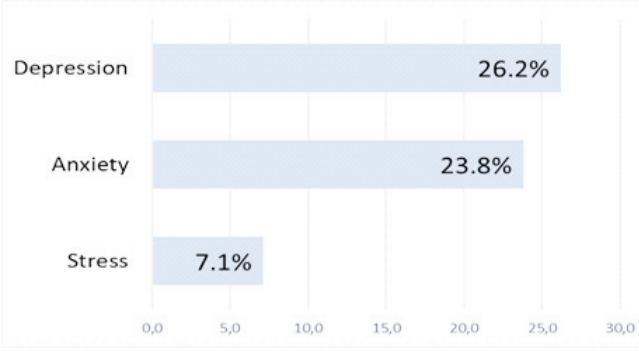


Figure 3. Depression, anxiety, and stress prevalences of the participants in the 6-month follow-up.

rate or higher levels based on DASS-21. Fourteen participants scored below the threshold in all subscales. Among the rest, 10 experienced all three symptoms concurrently. Partial overlaps were also noted: 5 participants had both depression and anxiety, 3 had depression and stress, while 3 experienced only anxiety and 7 only depression.

Using the cut-off values of DASS-21, prevalences of depression, anxiety, and stress were calculated. Among the participants, 26.2% had depression, 23.8% had anxiety, and 7.1% had stress psychometrically (See Figure 3).

Table 4 demonstrates the correlation analysis of primary and follow-up measurements. The participant's age was negatively associated with DASS-21 scores ($r = -0.432$, $p = 0.004$), as well as with scores on the depression subscale ($r = -0.398$, $p = 0.008$) and the stress subscale ($r = -0.417$, $p = 0.006$). The CGI score at the first application was positively related to the anxiety score ($r = 0.442$, $p = 0.003$) and negatively related to the resilience score ($r = -0.331$, $p = 0.032$) in the follow-up. Higher resilience scores were associated with lower levels of DASS-21 ($r = -0.578$, $p < 0.001$), depression ($r = -0.553$, $p < 0.001$), and stress ($r = -0.595$, $p < 0.001$). Anxiety scores were also negatively related to resilience with a marginal significance ($r=-0.303$ $p=0.051$).

DISCUSSION

The present study evaluated the psychological distress and resilience among individuals who presented to the disaster psychiatry outpatient clinic six months after the earthquake disaster. At the sixth-month mark following the disaster, among individuals attending the DPOC, depression was observed in 26.2%, anxiety in 23.8%, and stress in 7.1% of the cases. Baseline CGI scores were positively correlated with anxiety and negatively associated with resilience in the follow-up. Age appeared to be a significant factor in that younger participants had higher psychological distress. Psychological resilience was associated with lower distress.

The prevalence of psychiatric disorders in the post-earthquake period is reported at varying prevalence rates. Yokoyama and colleagues found that severe mental health problems were 42.6% prevalent among the survivors six to twelve months after the earthquake (21). Guo and colleagues reported that 22.9% of adults had depression scores above the cut-off six months after the Wenchuan earthquake (22). A study after the Pakistan earthquake showed that 63% of women survivors at reproductive age experienced anxiety symptoms, while 54% had symptoms of depression (23). Another study on the 1988 Armenia earthquake reported that 52% of adult survivors met the criteria for depression (24). Although psychiatric symptoms can be observed frequently after an earthquake, the application rates of people seeking professional help may be variable in association with cultural factors (25). At the same time, it is known that the severity of the disaster and the support provided after the disaster are important in terms of psychiatric symptoms (22). Variations in the prevalence of psychiatric disorders in the post-disaster period may be related to the severity of the disaster, cultural fac-

Table 4. Correlation analysis of age and psychological measurements (n=42).

	I	II	III	IV	V	VI
Age (I)	-					
CGI (II)	0.077	-				
BRS (III)	0.259	-0.331*	-			
DASS-21 (IV)	-0.431**	0.277	-0.578**	-		
Depression (V)	-0.398**	0.076	-0.553**	0.848**	-	
Anxiety (VI)	-0.275	0.442**	-0.303[a]	0.766**	0.398*	-
Stress (VII)	-0.417**	0.217	-0.595**	0.932**	0.740**	0.617**

DASS-21: Depression Anxiety Stress-21 Scale, BRS: Brief Psychological Resilience Scale
** : Correlation is significant at the 0.01 level (2-tailed).
* : Correlation is significant at the 0.05 level (2-tailed).
[a]: p=0.051

tors, the time after the disaster, and post-disaster support resources.

According to Hobfoll, individuals experience psychological stress when the resources they value are either lost or threatened. Sudden and devastating events such as earthquakes may lead to the loss of both physical (e.g., shelter, safety) and psychological (e.g., sense of security, social support) resources, thereby increasing stress levels. Based on the Conservation of Resources (COR) theory, individuals tend to rely on protective factors such as social support, self-esteem, and psychological resilience to prevent entering a resource-loss spiral (26). Particularly in post-disaster contexts, access to safe environments, opportunities for rapid relocation, and psychosocial first aid services such as DPOC may help individuals restore their depleted resources.

The population that DPOC served was relatively advantaged since they could immediately find a safe place out of the disaster zone; none of them were trapped under the rubble, only 7.1% of them were physically harmed, and 2.1% lost their family. Thus, that may be the reason the present study found lower prevalences. Additionally, considering that the study population received psychological first aid in the DPOC, this may help alleviate psychological distress following the disaster.

In previous studies, gender, socioeconomic status, education level, age, perceived psychosocial support, and peritraumatic distress were reported as risk factors for psychiatric symptoms after a disaster (27-29). In the review, Cénat et al. reported that depression and anxiety symptoms may decrease over time, but the time factor may not be a moderator in terms of PTSD symptoms (6). Identifying high-risk groups in the post-disaster period and providing follow-up care and treatment can make valuable contributions to reducing associated morbidity. In this context, follow-up and treatment processes of individuals who experience more severe psychiatric symptoms in the early period are important. The present study showed that baseline clinical evaluation was related to the sixth-month outcomes, showing that those who suffer from psychological distress soon after the earthquake are at risk. In addition, differentiating between traumatic events (as defined by DSM-5) and stressful life events is essential when evaluating prior adversity. Half of the participants who reported previous difficult experiences met the diagnostic threshold for trauma, which may have implications for how such experiences influence post-disaster psychological responses.

Natural disasters such as earthquakes are risk factors for stress and psychiatric disorders. The psychological challenges experienced by people after disasters vary. Psychological resilience has been considered a predictor in the assessment process of such differences (7, 27). There is a negative relationship between increased psychological resilience and psychiatric symptoms (30).

It has been reported in many studies that age may be a predictor for psychiatric symptoms in the post-disaster period. However, it has been reported that this predictive effect may not be valid in different mental disorders (31); this difference emerged in young men (21), and being young or old may be a risk factor (32). Bonanno et al. reported that traumatic stress reactions are less familiar with increasing age and that age may be associated with psychological resilience (27). The present study population was young, with a mean age of 38.7, which may be the reason for the correlation between younger age and higher psychological distress.

Future research should include longitudinal assessments beginning in the acute phase of disaster response to better capture symptom trajectories over time. Additionally, studies with larger and more diverse samples across varying levels of trauma exposure would help clarify risk and resilience factors among disaster-affected populations.

Strengths and limitations

The present study demonstrated that baseline clinical characteristics were associated with psychological outcomes at six months, offering valuable insight into the long-term mental health trajectories of individuals affected by disaster.

However, several limitations should be acknowledged. First, the sample size was relatively small,

and no a priori power analysis was conducted due to the emergency nature of the setting and the exploratory design of the study. Although naturalistic recruitment enhanced ecological validity, the absence of systematic baseline psychometric data limited our ability to evaluate changes in symptom severity over time. Additionally, follow-up data were collected through self-administered online surveys, which may have introduced response bias or inaccuracies. It is also worth noting that the study did not involve formal psychiatric diagnoses. Instead, standardized self-report psychometric instruments were used to assess symptom severity levels. Therefore, findings should be interpreted as reflecting psychological distress rather than diagnostic prevalence. We did not collect systematic data on whether participants received pharmacological or psychotherapeutic interventions during the six-month follow-up period. That constitutes a limitation, as such treatments could have influenced psychological outcomes.

Another important consideration is the potential for selection bias. The study included only those who could be contacted by phone and who consented to participate, raising the possibility of nonresponse bias. Individuals who declined or could not be reached may have differed meaningfully from participants in terms of psychological distress.

Furthermore, most participants had relocated to relatively safe regions shortly after the earthquake and voluntarily sought mental health services. That suggests that the sample may represent a more advantaged subgroup in terms of post-disaster conditions, which limits the generalizability of the findings to populations with higher levels of exposure or fewer resources.

Despite these limitations, the study contributes to the limited literature on post-disaster outpatient psychiatric assessment and highlights the importance of early clinical evaluation in shaping longer-term outcomes.

The present study focused on a population of earthquake survivors who relocated to a safe area shortly after the disaster and subsequently applied for mental health services. Baseline clinical evaluation with CGI was associated with higher anxiety and lower resilience in follow-up. Resilience was related to lower psychological distress regarding depression, anxiety, and stress. In the sixth month of the disaster, 26.2% had depression scores above the cut-off, and 23.8% had probable anxiety regarding cut-off values. Even relatively advantaged survivors of disasters experience adverse mental health outcomes. The study also shows that a psychiatric clinic may need to respond to an emergency due to a disaster outside its zone.

The study provides an examination of mental health outcomes following a disaster while defining mental health services in disaster situations. Psychiatry clinics should be flexible in serving the population's needs. The order of the day may not match routine working conditions as experienced by the authors. Even the clinic in the present study was not located in the disaster area; survivors of the earthquake arrived in the city seeking safe shelters, as well as those close to them or their relatives. Thus, the population that routinely served had changed. The authors' experience may help other mental health professionals in similar emergency conditions. Besides, the authors observed that the individuals who were assessed as having worse mental health ended up with higher psychological distress in the follow-up. That demonstrates that disaster psychiatry clinics should consider routine follow-ups and screenings. Since planning for those work in short periods is challenging, behavioral health clinics should consider emergency plans in the event of possible disasters.

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The intersection of addiction and crime: Criminal thinking tendencies in individuals diagnosed with substance use disorder

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SUMMARY

Objective: This study aims to examine the relationship between the severity of addiction and levels of criminal thinking in individuals diagnosed with substance use disorder. Additionally, it seeks to determine whether addiction severity predicts crime-related cognitive patterns.

Method: Conducted within a cross-sectional and quantitative research design, the study involved 198 inpatients receiving treatment at a public hospital in Istanbul. All participants were diagnosed with substance use disorder according to DSM-5 criteria. Data were collected using the Addiction Profile Index (API) and the Criminal Thinking Scale (CTS). The data were analyzed through Pearson correlation and simple linear regression techniques.

Results: Analyses revealed a weak but statistically significant positive correlation between addiction severity and criminal thinking levels ($r=.185$; $p<.01$). In particular, the subdimensions of "entitlement," "power orientation," and "criminal rationalization" were significantly associated with addiction severity. The regression model indicated that addiction severity significantly predicted criminal thinking ($\beta=.371$; $p<.05$); however, the explanatory power of the model was limited ($R^2=.03$).

Discussion: The findings suggest that as addiction severity increases, individuals are more likely to exhibit cognitive patterns associated with criminality. This highlights the importance of addressing not only behavioral aspects but also cognitive tendencies during addiction treatment processes, underscoring the need for a holistic intervention approach.

Key Words: Substance use disorder, addiction severity, criminal thinking, propensity for crime

INTRODUCTION

Addiction is a chronic and relapsing disorder that profoundly affects an individual's life on biological, psychological, and social levels. The American Society of Addiction Medicine (ASAM) defines addiction as a neuropsychiatric disease characterized by dysfunctions in the brain's reward, motivation, and memory systems (1). These dysfunctions manifest through symptoms such as impaired behavioral control, intense craving, and diminished functionality in interpersonal relationships. Substance use disorder (SUD), on the other hand, is a syndrome marked by cognitive, behavioral, and physiological symptoms in which the individual continues using substances despite experiencing significant harm. Diagnosis is typically based on patterns of pathological use, while the severity of the disorder is determined by the extent of impairment in the individual's functional domains (2). Addiction severity is a multidimensional construct encompassing the overall impact on physical health, psychological well-being, social relationships, and occupational functioning. In recent years, increasing attention has been given to the role of cognitive processes in addictive behaviors, suggesting that addiction cannot be fully explained

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by neurobiological factors alone. In this context, the concept of criminal thinking has gained prominence. Criminal thinking refers to cognitive patterns that include the rationalization of criminal behavior, externalization of responsibility, deviation from social norms, and deficiencies in impulse control (3,4).

Such patterns of thinking may play an influential role in the internalization and maintenance of criminal behavior. The main components of criminal thinking include subdimensions such as entitlement, personal irresponsibility, justification, power orientation, cold heartedness, and rationalization (5). For example, entitlement refers to perceiving one's desires as needs and thereby subordinating the rights of others. Personal irresponsibility expresses the tendency to hold others accountable for one's own actions, whereas rationalization denotes the process of legitimizing criminal behaviors through various justifications. These cognitive distortions have been shown to be effective in the continuation and recurrence of criminal behavior (6). The development of criminal thinking is shaped by social learning processes, early life experiences, and personality traits. In particular, impulsivity, lack of empathy, and low cognitive flexibility are common determinants of both addiction and criminal behavior (7,8). In addition, social injustice, familial risk factors, and traumatic life experiences may contribute to the reinforcement of these cognitive distortions.

The relationship between substance use disorder and criminal thinking holds critical importance for both clinical and forensic interventions. However, in Turkey, quantitative studies that directly examine the relationship between these two variables remain limited. The existing literature primarily focuses on the association between addiction and psychiatric symptoms such as depression and anxiety, while cognitive patterns related to criminality have been largely overlooked (4,9,10). Yet, criminal thinking structures encompass cognitive tendencies that may be decisive for the treatment process, risk of relapse, and social reintegration (11,12). This study statistically examined the relationship between addiction severity and the level of criminal thinking, as well as the predictive role of addiction severity on criminal cognition. The primary aim was to gain a deeper understanding of the cognitive mechanisms associated with criminal tendencies among individuals with substance use disorder. The findings are expected to provide a scientific basis for supporting substance use treatment not only through symptom-focused approaches but also through structured intervention programs that specifically address crime-related cognitive patterns.

Research Questions

1) Is there a significant relationship between addiction severity and the level of criminal thinking in individuals diagnosed with substance use disorder?

2) Does addiction severity significantly predict the level of criminal thinking among these individuals?

METHOD

Research Design

This study was structured as a descriptive, cross-sectional, and quantitative research based on a relational survey model. Relational survey designs aim to determine the degree and direction of relationships between two or more variables and are employed to explain the existing state of phenomena (13).

Participants

The study was conducted at the Adult Detoxification Unit of Bakırköy Prof. Dr. Mazhar Osman Mental and Neurological Diseases Hospital in Istanbul. The participants included individuals who had been diagnosed with substance use disorder according to DSM-5 diagnostic criteria and were receiving inpatient treatment at the time of the study. The data collection process was carried out between September and December 2023.

Inclusion Criteria

- Being 18 years of age or older,

• Having adequate cognitive capacity as determined by clinical evaluation,

• Having completed the withdrawal (detoxification) process,

• Not having severe comorbid psychiatric diagnoses such as schizophrenia, bipolar disorder, or major depressive disorder,

• Voluntarily agreeing to participate by signing an informed consent form.

Exclusion Criteria

• Patients with short-term hospitalization plans (Patients with short-term hospitalization plans are defined as those discharged before completing the treatment process. Such cases may occur due to personal request, non-compliance with clinical operational rules, or behaviors with the potential to negatively affect the treatment process of other patients),

• Individuals who are clinically unstable.

The required sample size for the study was calculated using the G*Power 3.1.10 software. Based on a medium effect size (r = 0.25), a statistical power of 95%, and a significance level of 5%, a minimum of 159 participants was targeted. During the data collection process, some participants were excluded due to incomplete responses or inconsistent answer patterns in their questionnaires. These forms were removed from the dataset, and the final analyses were conducted with data from 198 participants.

Data Collection Instruments

Clinical and Demographic Information Form: This form, developed by the researchers, includes information on participants' basic demographic characteristics as well as their clinical and forensic backgrounds. Variables covered in the form include age, gender, educational level, marital status, occupation, history of criminal behavior, family history of substance use, and the presence of psychiatric disorders within the family.

Addiction Profile Index (API): The Addiction Profile Index (API), developed by Ögel et al. (2015), is a 37-item self-report instrument designed to assess the level of addiction in individuals. The scale consists of five subdimensions: Substance Use Characteristics, Diagnosis, Impact on Life, Craving, and Motivation. Each item is rated on a 5-point Likert-type scale ranging from 0 to 4. The total score is calculated using a weighted formula, classifying addiction severity into three levels: low (<12), moderate (12–14), and high (>14) (14). The API provides a comprehensive measure of addiction by combining behavioral, psychological, and motivational components. The scale has demonstrated high internal consistency, with a Cronbach's alpha of $\alpha = .89$ reported in the original validation study. In the current study, the internal consistency coefficient was calculated as $\alpha = .85$.

Criminal Thinking Scale (CTS): The Criminal Thinking Scale (CTS), developed by Knight et al. (2006) and adapted into Turkish by Duyguner and Gölge (2019), consists of 23 items and six subdimensions: entitlement, personal irresponsibility, justification, power orientation, cold-heartedness, and criminal rationalization. Each item is rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The overall internal consistency coefficient of the scale was reported as $\alpha = .79$ in the original study, while in the present study it was calculated as $\alpha = .74$.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics 26.0. Descriptive statistics were computed based on total scores from the scales. Skewness and kurtosis values were examined, and all scores fell within the ±1.5 range, indicating normal distribution (15). Accordingly, parametric tests were applied. An independent samples t-test was used for group comparisons. Pearson correlation was conducted to assess the relationship between addiction severity and criminal thinking. Simple linear regression was used to examine whether addiction severity predicted criminal thinking. The significance level was set at $p < .05$ with a 95% confidence interval.

Table 1. Comparison of Addiction Profile Index (API) and Criminal Thinking Scale (CTS) Scores by family history of psychiatric disorder, family history of substance use, and criminal record (t-Test Results)

					t test			
Variable	Group	N	X	SS	t	sd	p	Difference
API	Family history of psychiatric disorder: Yes	41	13,4766	2,16224	,873	,49985	P>.05	-
	Family history of psychiatric disorder: No	157	13,0400	3,00110				
	Family history of substance use: Yes	29	13,2031	2,89799	,110	,57313	P>.05	-
	Family history of substance use: No	168	13,1401	2,84207				
	Criminal record: Yes	96	13,7859	2,35038	3,243	,39239	P?.05	1>2
	Criminal record: No	102	12,5134	3,13609				
CTS	Family history of psychiatric disorder: Yes	41	27,3489	4,11301	1,961	,80303	P>.05	-
	Family history of psychiatric disorder: No	157	25,7740	6,03855				
	Family history of substance use: Yes	29	28,1859	4,80524	2,124	1,14188	P?.05	1>2
	Family history of substance use: No	168	25,7609	5,81218				
	Criminal record: Yes	96	26,9882	5,79154	2,139	,80611	P?.05	1>2
	Criminal record: No	102	25,2643	5,55107				

RESULTS

Descriptive Statistics

Among the 198 participants included in the study, 69.7% (n = 138) were male, 42.9% (n = 85) had completed primary education, and 52.5% (n = 104) were married. A total of 44 participants (20.2%) reported a family history of psychiatric disorders, while 30 individuals (15.2%) had a family history of substance use. Nearly half of the participants (n = 96; 48.5%) had previously received a criminal sentence. Regarding addiction severity levels, 73 participants (36.9%) were classified as having high addiction severity, 68 (34.3%) as moderate, and 57 (28.8%) as low.

Group Comparisons Based on Clinical Variables

Independent samples t-test results examining the relationship between API and CTS scores and various clinical variables are presented in Table 1. Participants with a history of criminal conviction had significantly higher API scores than those without such a history ($t = 3.243$, $p < .05$). Likewise, CTS scores were also significantly higher in this group ($t = 2.139$, $p < .05$). A significant difference was found in CTS scores between participants with and without a family history of substance use ($t = 2.124$, $p < .05$), while API scores did not differ significantly between these groups ($p > .05$). No significant differences were observed in either API or CTS scores based on the presence of a family history of psychiatric disorders ($p > .05$) (Table 1).

Relationship Between Addiction Severity and Criminal Thinking

Pearson correlation analysis results examining the relationship between addiction severity (API) and criminal thinking (CTS) are presented in Table 2. The analysis revealed a weak but statistically significant positive correlation between API and overall CTS scores ($r=.185$, $p=.009$). When CTS subdimensions were analyzed, significant positive correlations were found between API and the entitlement ($r=.181$, $p=.011$), criminal rationalization ($r=.154$, $p=.031$), and power orientation ($r=.179$, $p=.034$) subscales. No significant correlations were observed between API and the remaining subdimensions: cold-heartedness, justification, and personal irresponsibility ($p > .05$) (Table 2).

Predictive Effect of Addiction Severity on Criminal Thinking

Findings from the simple linear regression analysis conducted to examine whether addiction severity (API) predicts criminal thinking (CTS) are presented in Table 3. The results indicate that the

Table 2. Pearson correlation analysis examining the relationship between addiction severity and criminal thinking

		1	2	3	4	5	6	7	8
API Total Score[1]	r	1							
	p								
CTS Total Score[2]	r	,185*	1						
	p	,009							
Entitlement[3]	r	,181*	,760*	1					
	p	,011	,000						
Criminal Rationalization[4]	r	,154*	,747*	,445*	1				
	p	,031	,000	,000					
Power Orientation[5]	r	,179*	,634*	,468*	,398*	1			
	p	-,034	,000	,000	,000				
Cold-Heartedness[6]	r	,633	,419*	,126	,025	,085	1		
	p	198	,000	,078	,723	,232			
Justification[7]	r	,098	,498*	,319*	,333	,325*	-,069	1	
	p	,168	,000	,000	,000	,000	,334		
Personal Irresponsibility[8]	r	,136	,495**	,272**	,428	,203*	-,046	,232*	1
	p	,056	,000	,000	,000	,004	,522	,001	

*$p < .05$ indicates a statistically significant correlation.

model is statistically significant ($F(1,196) = 6.908$, $p < .05$). Addiction severity was found to be a significant positive predictor of criminal thinking ($\beta = .371$, $t=2.628$, $p<.05$). The model accounted for approximately 3% of the variance in criminal thinking scores ($R^2=.034$; adjusted $R^2=.029$) (Table 3).

DISCUSSION

The findings show that individuals with a criminal history scored significantly higher in both addiction severity and criminal thinking. This supports the view that the link between addiction and criminal behavior should be addressed at the cognitive as well as behavioral level. Higher addiction scores among those with a criminal background may suggest that addiction increases criminal tendencies or, conversely, that criminal involvement reinforces addiction. This bidirectional relationship is often highlighted in forensic psychiatry (11,12,16). Additionally, individuals with a family history of substance use or psychiatric disorders displayed significantly higher criminal thinking scores. This suggests that deviant cognitive patterns may be acquired through social learning. Early exposure to maladaptive role models during childhood and adolescence is known to shape one's value systems and boundaries (17,18). Familial risk factors not only provide environmental context but also influence how individuals interpret and legitimize criminal behavior.

These findings are consistent with numerous studies in the literature and indicate that criminal tendencies in individuals with addiction should be evaluated not only in terms of individual psychopathology, but also within familial, social, and cognitive contexts (4,19). Considering such cognitive patterns in clinical and forensic interventions is critically important for improving both treatment adherence and social functioning.

The findings revealed that as addiction severity increased, criminal thinking scores also rose significantly. Individuals with high levels of addiction were more likely to rationalize criminal behavior and internalize distorted cognitive patterns. This relationship supports Walters' (2012) cognitive distortion model, which links addiction to structures such as entitlement, externalization, and personal irresponsibility (4). Similarly, Caudy et al. (2015) and Bakken et al. (2023) reported that substance use contributes to recidivism and reinforces crime-justifying thought processes (11,12). Becker and Murphy's (1988) rationalization theory posits that individuals with addiction develop cognitive distortions to justify deviant acts (20), while Elster and Skog (1999) argue that as addiction intensifies, vio-

Table 3. The Effect of Addiction Severity on Criminal Thinking

Variable	Unstandardized		Bootstrapping BCa 95%CI		Standardized		
	B	SE_B	Lower limit	Upper Limit	□	t	pr
Constant	21,235	1,894	17,500	24,970		11,212	
Addiction Severity	,371	,141	,093	,649	.371	2,628	-.034

$R= .185$ $R^2= .034$ $R^2_{adj}= .029$ $F(1, 196) =6,908$, $p<.05$

Dependent Variable: Criminal Thinking

lations of social norms are more easily rationalized (21). Smith and Saldana (2013) and Weber and Lynch (2021) found strong correlations between addiction and criminal thinking, suggesting that criminal behavior may be perceived as inevitable or legitimate (22,23). Fix and Fix (2015) emphasized that high addiction severity reinforces a sense of exemption from social norms (24). From a neuropsychological perspective, Baker (2018) and Lovenstein (2001) demonstrated that addiction impairs key cognitive functions such as judgment, empathy, and impulse control, facilitating the emergence of criminal justifications (25,26). Additionally, Brunelle et al. (2013, 2015) reported that individuals with high addiction severity often live in socially disadvantaged environments, which normalize criminal behavior and complicate treatment processes (27,28). Collectively, these findings underscore that increasing addiction severity is associated with stronger cognitive tendencies toward criminality, highlighting the need to address these mechanisms in both clinical and forensic interventions.

The simple linear regression analysis conducted in this study demonstrated that addiction severity significantly predicts levels of criminal thinking. The model was found to be statistically significant, with addiction severity accounting for 3% of the variance in criminal thinking scores ($R^2 = .03$). The positive regression coefficient indicates that higher levels of addiction are associated with stronger cognitive tendencies related to criminality. This finding suggests that addiction is linked not only to behavioral patterns but also to cognitive distortions. Walters (2012) emphasized that cognitive structures associated with criminal behavior—particularly entitlement, externalization, and personal irresponsibility—are more prevalent among individuals with substance use disorders (4). Similarly, Smith and Saldana (2013) and Weber and Lynch (2021) reported significant correlations between addiction and criminal thinking (22,23).

At the theoretical level, Becker and Murphy's (1988) rationalization model suggests that individuals develop cognitive distortions to justify their criminal behavior (20). Elster and Skog (2007) similarly emphasize that as addiction increases, the rationalization of social norm violations becomes easier (21). In addition, Baker (2018) and Lovenstein (2001) have shown that chronic substance use weakens higher-order cognitive functions such as judgment and impulse control, thereby facilitating the development of such distortions (25,26). In conclusion, addiction severity is a significant predictor of criminal thinking, and this relationship should be considered at both theoretical and practical levels. Intervention processes should address not only behavioral symptoms but also the underlying cognitive structures.

This study was conducted at a single treatment center in Istanbul, and the sample was predominantly male, which limits the generalizability of the findings to female populations. The use of self-report measures may have introduced risks of social desirability and recall bias. In particular, criminal history data were obtained solely through participants' self-reports, without verification from official records, which may have introduced reporting bias. Furthermore, the study did not differentiate between types of addiction (e.g., substance use, alcohol use, or behavioral addictions), as this variable was beyond the primary scope and objectives of the research; this may have somewhat limited the ability to explore potential differences in criminal thinking patterns across addiction types. Although the scales used were culturally adapted, certain cognitive constructs may still be interpreted differently depending on context, posing potential measurement limitations. Additionally, variables such as trauma history, personality traits, and social support were not included in the analysis, which may have influenced the outcomes. Although addiction severity was found to be a significant predictor of criminal thinking, the explained variance was limited, suggesting the need for more comprehensive models. Despite these limitations, the study offers a meaningful contribution to the literature as one of the few empirical investigations into the relationship between addiction severity and criminal thinking, and it provides a foundation for future research in this area.

This study examined the relationship between addiction severity and criminal thinking among individuals diagnosed with alcohol or substance use disorder. The findings revealed that higher addiction severity is significantly associated with eleva-

ted levels of criminal thinking. Moreover, individuals with a history of criminal behavior or a family history of substance use exhibited higher levels of criminal cognition.

Correlation and regression analyses indicated that addiction severity is a significant positive predictor of criminal thinking. This suggests that addiction is not solely a physiological or behavioral issue, but is also linked to cognitive patterns related to criminality—particularly justification of crime, externalization of responsibility, and power-oriented thinking. The study's key contribution lies in its predictive modeling of this relationship and its discussion of clinical implications, addressing a gap often overlooked in previous correlation-based research.

These results highlight the need to integrate crime-related cognitive patterns into addiction assessment and intervention processes. Identifying and addressing such distortions, especially in individuals with a forensic background, may enhance treatment outcomes.

Future studies should explore variables such as type of offense, duration of addiction, substance type, and co-occurring psychiatric diagnoses. Qualitative approaches could further illuminate this complex relationship, providing a foundation for comprehensive and evidence-based strategies to disrupt the addiction–crime cycle.

Statements and Declarations

Ethics Committee Approval: All participants in the study were presented with an informed consent form for voluntary participation, and the data were collected anonymously. Prior to the implementation of the survey, ethics committee approval was obtained from the Ethics Committee for Social and Human Sciences of Istanbul Medipol University, with decision number 101.

Consent to participate: Written informed consent was obtained from the participants.

Consent for publication: Not applicable.

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Attitudes, behaviors, and influencing factors of medical and health sciences students towards dating violence

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SUMMARY

Objective: Dating violence is common and important; however, it is preventable public health. Many studies show that both men and women are widely affected. According to studies done in Türkiye, the ratio of being exposed to violence or abuse in a dating relationship changes up to 85.3%. Our objective was to evaluate the prevalence of dating violence and the attitudes and factors affecting it among healthcare university students.

Method: A total of 908 students were included in the analyses. Univarite and multivariate analysis were carried out.

Results: Of the participants, 36.6% had never heard of the concept of dating violence. The prevalence of exposure to dating violence was 33.6%, the prevalence of perpetration was 17.8% in past relationships; the rate of those who are exposed is 10.1% and the rate of those who perpetrated dating violence is 6.7% in their current relationships. Psychological dating violence was the type of dating violence that was committed and exposed the most in both current and past relationships. Women, students at the clinical education level, and students from upper social class had unfavorable attitudes toward dating violence. Those who did not witness dating violence in their close circle of friends had better attitudes toward dating violence. Witnesses of domestic violence had statistically significant favo-rable attitude towards psychological dating violence more than of those who did not. Only one of the 232 people stated that they applied to the official authorities when exposed to dating violence.

Discussion: It is alarming that one in three medical and health sciences students, who should be among the primary people who need to take action against violence in the future, have never heard of dating violence.

Key Words: Violence, intimate partner violence, exposure to violence

INTRODUCTION

Intimate partner violence (IPV) refers to behavior within an intimate relationship that causes physical, sexual, or psychological harm, including acts of physical aggression, sexual coercion, psychological abuse, and controlling behaviors. This definition covers violence by both current and former spouses and partners (1, 2). Dating violence (DV) is a form of IPV that can be experienced at an early age, is challenging to distinguish, and can have lifelong effects on health and well-being (1). It can escalate into many forms of violence, such as domestic violence, which is another important form of violence in adulthood. (3). Therefore, establishing its detection and awareness enables the prevention of many types of violence that may occur in the future (1,4,5).

About one in four women and one in ten men experienced contact sexual violence, physical violence, and/or stalking by an intimate partner, and repor-ted an IPV-related impact during their lifetime (1). IPV is also shown to be quite common among adolescents and young adults (6,3). The research on violence against women conducted by World Health Organization (WHO) in 161 countries between 2000 and 2018 revealed that one out of every three women (30%) was exposed to sexual or physical violence by a partner or non-partner (3), while a national study conducted in the USA revealed that four out of every ten college students have been subjected to violence or harassment in a dating relationship (7). Similarly, in Türkiye, these rates go up to 85.3% (8,9,10,11,12,13,14). Consequently, DV is very common among adolescents and young adults, but it is also a preventable

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public health problem (1,3,15).

Theories offer different explanations for violent behavior and its use. In social learning theory (SLT), witnessing or being exposed to violence in the family and in feminist theory, the power control mechanism between men and women created by an underlying patriarchal social system considered main determinants of violent behaviour. Moreover, in the theory of social norms, violent behaviour occur as people tend to conform to social norms even if they are harmful, such as violence. (16). Though interventions have little impact on the perpetration and victimization of DV, their success in improving knowledge and attitudes toward DV still warrants further research (17).

In previous studies being an adolescent, gender, low socioeconomic status, living in a rural area, living with extended family, using alcohol and drugs, eating and sleeping disorders, mental health problems such as fear, anxiety, trauma and suicide, social isolation, shame, guilt, anger, aggression, lack of support system of individuals, conflicts in relationships, history of violence among family or close friends, exhibiting asocial behaviors, previous exposure to violence have shown to have effects on DV (10,18,19,20).

Previous studies, in accordance with the SLT, showed those who had been exposed to domestic violence in childhood perpetrated DV more than 4.87 times and those who witnessed it more than 3.84 times (21). The fact that those who have not witnessed intimate partner violence during childhood still constitute a significant part of the perpetrators, necessitates the investigation of other risk and protective factors (5).

Healthcare professionals are key players in reducing gender discrimination and violence, and it is vital that they have a high awareness of them, and they are well-equipped to take the necessary steps when in need (22,23,24) Therefore, we aimed to evaluate the prevalence of DV behaviour and the attitudes toward it and factors affecting it among the students of the Faculty of Health Sciences and Faculty of Medicine at Manisa Celal Bayar University.

Accordingly, - three research questions were formulated:

Q1. What is the prevalence of perpetration and exposure rate of DV in healthcare students' past and present relationships?

Q2. What are the factors that affect the DV attitudes of healthcare students?

Q3. What are the factors that affect the DV behavior of healthcare students?

METHODS

This cross-sectional study was carried out at Manisa Celal Bayar University, Faculty of Medicine, and Faculty of Health Sciences in 2021-2022 educational period. The population of the study consists of 3794 students, 1320 medical and 2474 health sciences students (including midwifery, nursing, social work, physiotherapy, and rehabilitation departments), studying at Manisa Celal Bayar University in Türkiye.

Since the results of the previous prevalence studies that used the same scale indicate a very wide range (2.4-85.3%), a DV prevalence value of 50.0% (unknown prevelance) is adopted. The sample size was calculated as 843 on Epi info 7 software, by taking α value of 0.05, the study confidence level of 99.9%, and a design effect of 1 (25). The number of people who participated in the study was 614 at first, and after 2 reminders, the total number of participants included in the analyses was 908, reaching a response rate of 23.9%.

Data Collection and Tool

Due to the COVID-19 pandemic, participation in theoretical classes was not mandatory. To reach out to the students who choose to attend classes online or who were in an isolation period for any reason, the Google online survey method was used for collecting data. Data collection forms were delivered to the students through WhatsApp groups specific to the year in which all students were a member. A total of 2 reminders were made on the 2nd and 4th

days. The data collection form, which was created by the researchers by reviewing the literature and included the Intimate Partner Violence Attitude - Revised Form-Scale (IPVAS-R), was used.

Dependent Variable

The dependent variable of the study was the attitude toward DV. It was evaluated using the Intimate Partner Violence Attitude Scale-Revised Form (IPVAS-R) scale. The scale developed by Fincham et al. (2008) was designed to measure the attitudes of university students toward psychological and physical aggression experienced in a dating relationship (26). Demirtas et al. completed the adaptation study to Turkish (13). IPVAS-R is a self-assessment scale consisting of 3 dimensions (abuse-8 items, control-5 items, and violence-4 items) and 17 items (13). In the directive used, it was requested from participants to rate how compatible each item was for them, between 1 (Strongly Disagree) and 5 (Strongly Agree). The scale does not have a cut-off score and an increase in the scale scores indicates an increase in the level of acceptance of DV by the participant. Items 2, 4, 5, 8, 12, 13, 14, and 17 of the scale are reverse scored. While the dimension of "violence" was used to measure attitudes toward physical violence, the dimension of "abuse" and "control" were included to measure attitudes toward psychological violence. The minimum and maximum scores that can be taken from each sub-dimension of physical violence and psychological violence were 4–20 and 13-65, respectively. Cronbach's alpha for the full IPVAS-R was .72. The internal consistency coefficients of the scale were calculated as .72, .62, and .65 for violence, control, and abuse dimensions, respectively. In our study, Cronbach alpha value was 0.82 for the total scale.

Independent Variables

In the first section, the sociodemographic and personal characteristics of individuals were questioned. In the second section, which included questions about dating relationships and DV, the first question was whether ever heard of the DV concept before. After this question, a brief explanation of DV (‡) was given, so that the participants could answer the following questions more accurately. Subsequently, whether ever dated before, the age during the first dating relationship, the longest duration of a dating relationship, whether ever committed or been exposed to DV before, what type of DV was being exposed to, and their reaction to it, having a current dating relationship, (if yes) the duration of it, whether commits or exposes to DV in the current dating relationship, if so the type of the DV and the related reaction when exposed to DV in the current relationship, whether shared this situation with her family or anyone besides family and their reactions and witnessing DV among close friends were questioned.

The students studying in the 1st, 2nd, and 3rd years in both faculties were grouped as "pre-clinical", the students studying in the 4th, 5th, and 6th years in the medical faculty, and in the 4th year in the faculty of health sciences were grouped as "clinical" since both health sciences and medical students start their clinical practices in their 4th year of studies. According to the occupation of the parents, the participants were classified as "upper" and "lower" according to the social classification of Boratav, designed for Türkiye (27). Eastern Anatolia Region and Southeastern Anatolia Region were grouped as "east", and the rest of the country was grouped as "west" considering the geography and development of the regions (28).

Statistical analysis

The IBM SPSS 24.0 program was used for all the analyses. The numbers and percentages were given in descriptive analysis. In univariate analyses, parametric tests (Student's t-test or ANOVA) were used when the data were normally distributed or $n>30$ in each subgroup (29), and non-parametric tests (Mann Whitney-U or Kruskal Wallis tests) were used when data were not normally distributed or $n<30$ in any subgroup. Post-hoc tests were performed when the number of groups was 3 or more. P-value was considered <0.05 in all analyses.

Ethical Committee Approval

Approval for the study was obtained from the Ethics Committee of the university (Ref. number:

Table 1: Sociodemographic Characteristics of the Participants (n=908)

Characteristics	n	%
Gender		
Woman	611	67.3
Man	297	32.7
Faculty		
Medicine	583	64.2
Health Sciences	325	35.8
• *Midwifery*	*69*	*7,6*
• *Nursing*	*110*	*12,1*
• *Social Work*	*66*	*7,3*
• *Physiotherapy and Rehabilitation*	*80*	*8,8*
Year of Education		
Pre-clinical	496	54.6
Clinical	412	45.4
Living (with)		
Friends	468	51.5
Parents	230	25.3
Alone	194	21.4
Spouse/Partner	16	1.8
To Have Been Migrated to Manisa		
Yes	775	85.4
No	133	14.6
Place of being brought up (Until 12 years old)		
City center	499	54.9
District of city (rural)	409	45.1
Family Type		
Nuclear family	769	84.6
Large family (with relatives)	84	9.3
Fragmented family	55	6.1
Having sibling(s)		
Yes	821	90.4
No	87	9.6
Having a sibling from opposite sex (n=821)		
Yes	520	63.4
No	301	36.6
Mother		
Alive	893	98.3
Dead	15	1.7
Father		
Alive	882	97.1
Dead	26	2.9
Perceived Family Income		
Income less than expenses	188	20.7
Income equals to expenses	481	53.0
Income more than expenses	239	26.3
Smoking		
Never used	607	66.8
Active user	204	22.5
Quitted	97	10.7
Drinking alcohol		
Never drank	343	37.8
Only tried	118	13.0
Occasionally drinking	397	43.7
Often drinking	50	5.5
Mental Health Problem Diagnosed by a Physician		
No	800	88.1
Yes	108	11.9
Regular Follow-up by a Physician (n=108)		
Yes	38	35.2
Rarely (when I need)	38	35.2
No	32	29.6

20.478.486/1177). In our study, participation was voluntary. Before filling out the questionnaires, we informed the participants about the purpose of the study, that the information they would provide would only be used for scientific purposes, and that the confidentiality of the information would be protected.

RESULTS

Totally 908 students were included in the analyses. The sociodemographic characteristics of the participants and descriptive data of the questions about dating and DV are presented in Tables 1&2. The median age of the participants was 21.0 [IQR (25-75): 19.0-23.0] and only 4 participants were married.

The type of DV that was committed and was exposed the most was psychological DV in both current and past relationships. The type of action they took when they were exposed to DV, half of them stated that they reconciled, and the other half stated they ended the relationship (Table 3).

Women ($p<0.001$, $p=0.036$, $p<0.001$), students in the clinical education level ($p=0.010$, $p<0.001$, $p=0.031$), and those with a nuclear family ($p=0.007$, $p=0.020$, $p=0.027$) had a statistically significant lower attitude score toward DV in all scale scores. While the place of immigration, having siblings, and doing regular physical activity are variables that affected both the total and psychological subscale score; social class is the variable that affected both the total and physical subscale score (Table 4). It was observed that those who did not witness DV in their close circle of friends had better attitudes in the same scale scores. Witnessing domestic violence, being exposed to domestic violence, and being exposed to DV in past relationships were risk factors for more perpetration of DV in past relationships ($p<0.001$ for all). Exposure to

Table 2: Responses of participants to questions regarding dating violence (n=908)

Variables	n	%
Witnessing Domestic Violence		
No	650	71.6
Yes	258	28.4
Exposure to Domestic Violence		
No	715	78.7
Yes	193	21.3
Hearing the Concept of Dating Violence		
Yes	576	63.4
No	332	36.6
Having a Dating Relationship So Far		
Yes	691	76.1
No	217	23.9
Committing Dating Violence in Past Relationships (n=691)		
No	568	82.2
Yes	123	17.8
Exposure to Dating Violence in Past Relationships (n=691)		
No	459	66.4
Yes	232	33.6
Having a Current Date		
No	563	62.0
Yes	345	38.0
Committing Dating Violence in the Current Dating (n=345)		
No	322	93.3
Yes	23	6.7
Exposure to Dating Violence in Current Dating Relationship (n=345)		
No	310	89.9
Yes	35	10.1
Sharing with Family When Exposed to Dating Violence (n=35)		
No	29	82.9
Yes	6	17.1
Sharing with Someone Beside the Family When Subjected to Dating Violence (n=35)		
Yes	28	80.0
No	7	20.0
Witnessing Dating Violence Among Friends		
Yes	536	59.0
No	372	41.0

Table 3. Type of Dating Violence Committed/Exposed and Distribution of Related Reactions*

	n	%
The type of dating violence committed by those who had a date so far (n=691)		
Psychological (Verbal. emotional)	120	17.4
Digital (Online or social media)	19	2.7
Physically	9	1.3
Sexual	7	1.0
Economic	2	0.3
The type of dating violence that those who had a date so far have been exposed to (n=691)		
Psychological (Verbal. emotional)	224	32.4
Digital (Online or social media)	60	8.7
Sexual	41	5.9
Physically	29	4.2
Economic	11	1.6
Types of reactions when exposed to dating violence (n=232)		
I was hurt but then I made up	118	50.9
I ended the relationship	114	49.1
I was unresponsive	48	20.7
I also committed him/her dating violence	39	16.8
I applied to official institutions for investigation.	1	0.4
Types of dating violence committed by those who are currently in a relationship (n=345)		
Psychological (Verbal. emotional)	23	6.7
Physically	2	0.6
Economic	2	0.6
Digital (Online or social media)	1	0.3
Sexual	0	0.0
The type of dating violence exposed by those who are currently in a relationship (n=345)		
Psychological (Verbal. emotional)	33	9.6
Physically	3	0.9
Economic	3	0.9
Digital (Online or social media)	2	0.6
Sexual	2	0.6

*Multiple choice questions.

domestic violence ($p<0.001$), exposure to DV in past relationships ($p<0.001$), and perpetrating DV in past relationships ($p=0,004$) were identified as risk factors for more perpetration of DV in the current relationships (Table 5&6).

DISCUSSION

The results of our study have salient findings. In their past relationships, 17.8% of the participants stated that they perpetrated DV, and 33.6% were exposed to it. The figures for current relationships were 6.7% and 10.1%, respectively. In one of the studies conducted only on female university students in Türkiye, there are studies that found the prevalence of DV, the majority of which is psychological violence, to be 85.3% (30). The prevalence of DV seems to be lower compared to this and many other studies conducted in Türkiye (8,9,10, 11,12,14). One of the other striking findings in our study that should also be noted is that one out of every three healthcare students has not heard of the concept of DV. In previous studies conducted in Türkiye, it was shown that nursing and midwifery students did not have enough knowledge about DV (31). When this is taken into consideration with the high prevalence of domestic violence reported in our study, it is worrying that a public health problem is so little known, albeit as a concept, by future healthcare professionals, who need to act on any type of violence by seeing the signs, preventing it, and being an advocate.

According to multivariate analysis, it was observed statistically that individuals who perpetrated dating violence were older, they were exposed to domestic violence, witnessed violence among friends, and their attitude towards dating violence were worse. In women compared to men, as age increases, in divided families compared to nuclear and extended families, in those diagnosed with mental illness, in those exposed to domestic violence, in those who know the concept of dating violence and in those who witness violence among friends, exposure to dating violence were statistically higher (Table 6). Aligning with previous studies, those who perpetrated DV in both current and past relationships have been exposed to domestic violence and DV in their past relationships more (10,31,32,33). In addition, those who perpetrated DV in their past relationships have also perpetrated DV more in their current relationships. However, while witnessing domestic violence was found to be important for perpetrating DV in past relationships, this relationship was not observed in current relationships. Also, the attitudes of those who witnessed domestic violence toward psychological DV were worse. Since no difference was observed in the attitude

Table 4: Univariates Analysis of Dating Violence Attitudes of Participants by Scale Scores

Characteristics	n	Total Scale Score Mean – SD	Attitude Towards Physical Violence Score Mean – SD	Attitude Towards Psychological Violence Score Mean – SD
Gender				
Woman	611	28.48–8.40	5.21–3.10	23.27–6.54
Man	297	32.84–8.70	5.74–3.82	27.09–6.33
Mean Dif. (%95 CI)			0,53 (0,03-1,04)	3,82 (2,92-4,72)
t test (Cohens d)		7,246 (0,513)	2,104 (0,160)	8,340 (0,590)
p-value		<0.001	0.036	<0.001
Faculty				
Medicine	583	29.55–8.05	5.11–2.94	24.44–6.38
Health Sciences	325	30.53–9.83	5.86–3.97	24.67–7.28
Mean Dif. (%95 CI)		0,97 (-0,21-2,17)	0,75 (0,29-1,20)	0,23 (-0,68-1,14)
t test (Cohens d)		1,160 (0,112)	3,230 (0,224)	0,494 (0,034)
p-value		0.126	0.003	0.634
Year of Education				
Pre-clinical	496	30.58–8.94	13.75–4.19	24.96–6.76
Clinical	412	29.09– 8.41	12.67–3.94	23.99–6.63
Mean Dif. (%95 CI)		1,49 (0,35-2,63)	0,52 (0,09-0,96)	0,97 (0,09-1,84)
t test (Cohens d)		2,569 (0,171)	2,387 (0,157)	2,163 (0,144)
p-value		0.010	<0.001	0.031
Place of Residence				
Others	678	29.86–8.97	5.39–3.39	24.46–6.83
Home	230	30.04–8.01	5.36–3.27	24.68–6.38
Mean Dif. (%95 CI)		1,09 (-0,08-2,26)	0,53 (0,54-1,00)	0,56 (-0,34-1,47)
t test (Cohens d)		1,827 (0,125)	2,189 (0,157)	1,229 (0,084)
p-value		0.072	0.027	0.238
Place of Immigration				
West	702	29.79–8.90	5.38–3.34	24.40–6.82
East	73	32.60–8.11	5.73–3.67	26.86–6.00
Mean Dif. (%95 CI)		2,81 (0,68-4,94)	0,35 (-0,46-1,17)	2,45 (0,82-4,08)
t test (Cohens d)		2,585 (0,318)	0,854 (0,105)	2,954 (0,363)
p-value		0.010	0.393	0.003
Place of being brought up (Until 12 years old)				
City center	499	29.34–8.03	5.18–2.97	24.15–6.40
District of city (rural)	409	30.60–9.49	5.63–3.77	24.97–7.06
Mean Dif. (%95 CI)		1,26 (0,121-2,40)	0,45 (-0,00-0,90)	0,81 (-0,64-1,69)
t test (Cohens d)		2,171 (0,145)	1,657 (0,134)	1,820 (0,121)
p-value		0.030	0.051	0.069
Family Type*				
Nuclear family	511	29.52–8.20 (28,94-30,11)	5.25–3.14 (5,03-5,48)	24.27–6.35 (23,82-24,72)
Large family (with relatives)	32	32.22–10.61 (29,92-34,53)	6.17–4.46 (5,21-7,15)	26.04–8.00 (24,31-27,79)
Fragmented family	40	31.74–11.78 (28,56-34,93)	6.01–4.18 (4,89-7,15)	25.72–8.89 (23,32-28,13)
F test (n^2)		4,951 (0,011)	3,910 (0,009)	3,612 (0,008)
p-value		0.007	0.020	0.027

*According to the post hoc analysis, no significant difference was found between groups.

Having sibling(s)				
Yes	820	30.12–8.88	5.42–3.41	24.69–6.80
No	88	27.90–6.92	5.00–2.83	22.90–5.56
Mean Dif. (%95 CI)		2,21 (0,28-4,14)	0,43 (-0,32-1,18)	1,79 (0,30-3,27)
t test (Cohens d)		2,252 (0,254)	1,127 (0,127)	2,364 (0,267)
p-value		0.025	0.260	0.018
Number of Siblings				
None	88	28.03–6.98 (26,56-29,51)	5.01–2.81 (4,41-5,61)	23.02–5.63 (21,83-24,22)
One	490	29.77 –8.58 (29,01-30,53)	5.24–3.09 (4,97-5,52)	24.53–6.62 (23,94-25,12)
More than one	330	30.61–9.30 (29,61-31,62)	5.70–3.83 (5,29-6,12)	24.91–7.06 (24,15-25,68)
F test (n^2)		3,178 (0,007)	2,474 (0,005)	2,760 (0,006)
p-value		0.042	0.085	0.064

*According to the post hoc analysis, a significant difference (assessed by Bonferroni correction) was found between no sibling and more than one sibling (p=0,041).

Social Class				
Upper social class	556	29.37–7.80	5.09–2.92	24.28–6.27
Lower social class	346	30.75–9.99	5.85–3.92	24.90–7.36
Mean Dif. (%95 CI)		1,37 (0,14-2,61)	0,76 (0,28-1,24)	0,61 (-0,32-1,55)
t test (Cohens d)		2,187 (0,158)	3,117 (0,227)	1,296 (0,092)
p-value		0.029	0.002	0.195
Self-evaluation of health				
Very bad/Bad/	209	30.72–10.16	5.96–4.14	24.76–7.44
Neither bad nor good				
Good/Very good	699	29.66–8.25	5.21–3.07	24.45–6.48
Mean Dif. (%95 CI)		1,06 (-0,29-2,41)	0,75 (0,14-1,36)	0,31 (-0,81-1,44)
t test (Cohens d)		1,380 (0,122)	2,412 (0,223)	0,594 (0,047)
p-value		0.169	0.016	0.552
Regular Physical Activity				
No	739	29.52–8.60	5.28–3.22	24.76–6.60
Yes	169	31.59–9.16	5.82–3.92	24.24–6.72
Mean Dif. (%95 CI)		2,07 (0,61-3,52)	0,54 (-010-1,18)	1,52 (0,40-2,64)
t test (Cohens d)		2,784 (0,237)	1,676 (0,162)	2,669 (0,228)
p-value		0.005	0.095	0.008
Mental Health Problem Diagnosed by Physician				
No	800	30.06–8.94	5.44–3.49	24.62–6.83
Yes	108	28.74–6.96	4.93–2.07	23.80–5.77
Mean Dif. (%95 CI)		1,33 (-0,14-2,79)	0,51 (0,05-0,97)	0,81 (-0,38-2,01)
t test (Cohens d)		1,790 (0,152)	2,185 (0,152)	1,345 (0,121)
p-value		0.075	0.030	0.181
Witnessing Domestic Violence				
No	650	29.69–8.78	5.45–3.51	24.24–6.62
Yes	258	30.45–8.61	5.22–2.94	25.23–6.89
Mean Dif. (%95 CI)		0,76 (-0,50-2,02)	0,23 (-0,22-0,68)	0,99 (0,02-1,96)
t test (Cohens d)		1,182 (0,087)	1,009 (0,069)	2,008 (0,148)
p-value		0.238	0.350	0.045
Having a Dating Relationship So Far				
Yes	691	30.16–8.79	5.39–3.42	24.77–6.79
No	217	29.08–8.51	5.35–3.18	23.73–6.40
Mean Dif. (%95 CI)		1,08 (-0,25-2,41)	0,04 (-0,47-0,55)	1,04 (0,01-2,06)
t test (Cohens d)		1,590 (0,124)	0,159 (0,012)	1,990 (0,155)
p-value		0.112	0.874	0.047
Committing Dating Violence in the Current Dating Relationship (n=345)				
No	322	29.85–8.28	5.28–3.23	24.57–6.63
Yes	23	37.43–9.32	6.73–4.43	30.69–6.98
Mean Rank -No(Yes)		167,70 (247,22)	170,70 (205,20)	167,55 (249,28)
U statistics (Z score) r		1996,0 (-3,698) 0,199	2962,5 (-2,009) 0,108	1948,5 (-3,801) 0,205
p-value		<0.001	0,045	-<0.001
Exposure to Dating Violence in Current Dating Relationship (n=345)				
No	310	29.87–8.33	5.30–3.28	24.54–6.64
Yes	35	34.65–9.39	6.00–3.81	28.65–7.37
Mean Dif. (%95 CI)		167,67 / 220,19	171,39 / 187,26	167,39 / 222,69
U statistics (Z score) r		3773,5 (-2,956) 0,159	4926,0 (-1,118) 0,060	3686,0 (-3,113) 0,168
p-value		0,003	0,263	0.002
Witnessing Dating Violence in the Circle of Friends				
Yes	536	29.36–8.67	5.26–3.19	24.09–6.75
No	372	30.69–8.78	5.56–3.58	25.13–6.61
Mean Dif. (%95 CI)		1,34 (0,18-2,49)	0,30 (-0,14-0,75)	1,04 (0,15-1,92)
t test (Cohens d)		2,272 (0,153)	1,328 (0,090)	2,290 (0,155)
p-value		0.023	0.184	0.022

*Assessed with Mann-Whitney U test.

With whom lived, migration status to Manisa, having a sibling of the opposite gender, whether the father is alive or not, perceived family income, health insurance status, smoking and alcohol use, healthy and balanced diet, BMI, perceived assessment of physical appearance, and exposure to domestic violence were statistically not significant. The age of first dating relationship, the duration time of the longest dating relationship, committing dating violence in past relationships, exposure to dating violence in past relationships, having a date presently, and the duration of the current dating relationship were statistically not significant.

for the physical violence subscale, it might be indicating that individuals who have witnessed domestic violence can be one of the target populations for therapy and interventions, as a starting point for behavioral correction of DV.

Like in many studies the most common type of violence exposed was psychological DV (11,12,33) and the fact that only one of the 232 people who answered the relevant question has applied to official authorities most likely indicating that people do not know what to do or have a low belief that they can get the help they need when they seek help. This emphasizes that official and non-governmental organizations should increase their effectiveness in society.

As in many studies, it was determined that men's attitudes toward DV were more accepting than women's (11, 18, 34). It can be said that men have more accepting attitudes towards DV in line with the traditional structure of Turkish society and feminist theory, where the patriarchal order determines gender roles. Recent studies in Türkiye also show that gender norms still influence Turkish society and those who accept traditional gender norm roles are more likely to accept DV (34). The necessity for women to have equal roles with men in all areas of social life and eliminating discrimination based on gender stand out as important steps in reducing DV (36,37).

In our study, the students studying at the clinical level had statistically significant lower attitude scores than the students studying at the preclinical levels in all scale scores. These findings cannot be explained by the fact that the students studying at

Table 5. Univariate Analysis of Variables Related to Perpetration of Dating Violence and Exposure to Dating Violence

Variables	No perpetration of dating violence		Perpetration of dating violence		*p-value*	Non-exposure to dating violence		Exposure to dating violence		*p-value*
	n	%	n	%		n	%	n	%	
Age					<0,001					<0,001
Younger than 21 years old	340	85.9	56	14.1		289	73.0	107	27.0	
22 years old or more	222	75.3	73	24.7		166	56.3	129	43.7	
x^2 - cOR (%95 CI)	12,521 - 2,00 (1,36-2,94)					20,987 - 2,10 (1,52-2,89)				
Gender					0,010					<0,001
Female	354	78.5	97	21.5		273	60.5	178	39.5	
Male	208	86.7	32	13.3		182	75.8	58	24.2	
x^2 - cOR (%95 CI)	6,894 - 1,78 (1,15-2,75)					16,308 - 2,05 (1,44-2,90)				
School Type					0,024					0,003
Medical School	359	78.9	96	21.1		282	62.0	173	38.0	
School of Health Sciences	203	86.0	33	14.0		173	73.3	63	26.7	
x^2 - cOR (%95 CI)	5,182 - 1,64 (1,07-2,53)					8,866 - 1,69 (1,19-2,38)				
School Year (Phase)					<0,001					<0,001
Preclinical	306	86.4	48	13.6		261	73.7	93	26.3	
Clinical	256	76.0	81	24.0		194	57.6	143	42.4	
x^2 - cOR (%95 CI)	12,480 - 2,02(1,36-2,99)					20,053 - 2,07 (1,50-2,85)				
Family Structure					0,009					0,009
Nuclear	473	81.3	109	18.7		386	66.3	196	33.7	
Extended	56	91.8	5	8.2		46	75.4	15	24.6	
Fragmented	33	68.8	15	31.3		23	47.9	25	52.1	
x^2	9,411					9,401				
Smoking					<0,001					0,004
Non-user	354	85.9	58	14.1		289	70.1	123	29.9	
Active or previous user	208	74.6	71	25.4		166	59.5	113	40.5	
x^2 - cOR (%95 CI)	14,165 - 2,08(1,41-3,07)					8,386 - 1,60 (1,16-2,20)				
Consuming Alcohol					0,013					<0,001
Irregular/non consumer	241	85.8	40	14.2		207	73.7	74	26.3	
Regular consumer	321	78.3	89	21.7		248	60.5	162	39.5	
x^2 - cOR (%95 CI)	6,132 - 1,67(1,11-2,51)					12,874 - 1,83 (1,31-2,54)				
Adequate and Balanced Nutrition					0,040					
No	281	78.3	78	21.7						
Yes	281	84.6	51	15.4						
x^2 - cOR (%95 CI)	4,603 - 1,53 (1,03-2,26)									
Mental Illness Diagnosis					0,002					<0,001
No	501	83.2	101	16.8		418	69.4	184	30.6	
Yes	61	68.5	28	31.5		37	41.6	52	58.4	
x^2 - cOR (%95 CI)	11,010 - 2,28 (1,39-3,74)					26,765 - 3,19 (2,02-5,04)				
Witnessing Domestic Violence					<0,001					<0,001
No	424	87.8	59	12.2		356	73.7	127	26.3	
Yes	138	66.3	70	33.7		99	47.6	109	52.4	
x^2 - cOR (%95 CI)	44,010 - 3,64 (2,45-5,42)					44,073 - 3,09 (2,20-4,33)				
Experiencing Domestic Violence					<0,001					<0,001
No	457	86.1	74	13.9		384	72.3	147	27.7	
Yes	105	65.6	55	34.4		71	44.4	89	55.6	
x^2 - cOR (%95 CI)	33,829 - 3,23(2,15-4,87)					42,684 - 3,28 (2,27-4,72)				
Knowledge of Dating Violence Concept					<0,001					<0,001
No	211	89.4	25	10.6		192	81.4	44	18.6	
Yes	351	77.1	104	22.9		263	57.8	192	42.2	
x^2 - cOR (%95 CI)	15,393 - 2,50 (1,56-4,00)					38,335 - 3,20 (2,20-4,64)				
Witnessing Dating Violence Among Friends					<0,001					<0,001
No	226	95.0	12	5.0		208	87.4	30	12.6	
Yes	336	74.2	117	25.8		247	54.5	206	45.5	
x^2 - cOR (%95 CI)	44,398 - 6,59 (6,54-12,16)					74,958 - 5,78 (3,78-8,85)				

Table 6. Multivariate Analysis of Affecting Factors of the Perpetration of Dating Violence and Exposure to Dating Violence

Variables	Perpetration of Dating Violence§* [R^2: 0,25]		Exposure to Dating Violence§** [R^2: 0,31]	
	aOR (%95 CI)	p value	aOR (%95 CI)	p value
Age	1,19 (1,07-1,32)	0,001	1,68 (1,16-2,43)	0,006
Smoking *(Ref: Never-users)*	1,64 (1,07-2,52)	0,023	-	-
Gender *(Ref: Female)*	-	-	0,65 (0,43-0,97)	0,037
Family Structure *(Ref: Nuclear family)*	-	-		0,068
Extended family	-	-	1,10 (0,56-2,14)	0,789
Fragmented family	-	-	2,22 (1,13-4,37)	0,021
Mental Illness Diagnosis *(Ref: No)*	-	-	2,58 (1,53-4,35)	<0,001
Witnessing Domestic Violence *(Ref: No)*	2,92 (1,92-4,45)	<0,001	2,84 (1,89-4,26)	<0,001
Knowledge of Dating Violence Concept *(Ref: No)*	-	-	2,13 (1,39-3,26)	0,001
Witnessing Dating Violence Among Friends *(Ref: No)*	4,71 (2,46-9,03)	<0,001	4,27 (2,70-6,75)	<0,001
Total scale score	1,03 (1,00-1,05)	0,021	-	-

§ Logistic Regression Model with Backward Wald Elimination
** The model has been adjusted for: gender, family structure, school type, consuming alcohol, having a mental health problem diagnosed by a doctor, being exposed to domestic violence, having heard the concept of dating violence before, school year, and having an adequate and balanced diet.*
Overall significance and Likelihood Ratio (LR x†): x2(8) = 113,019, p < 0.001.
*** The model has been adjusted for: school type, smoking and consuming alcohol, witnessing domestic violence, total scale score, and school year.*
Overall significance and Likelihood Ratio (LR x†): x2(8) = 171,371, p < 0.001.

the clinical level were older than the students studying at the preclinical level. However, it can be interpreted that clinical students' levels of responsibility and awareness of the concept of violence are higher as a result of more frequent encounters in the clinic.

Türkiye's economic situation and socioeconomic differences have a high impact on cultural norms such as gender norms. Socio-economic and cultural differences in Türkiye are known in the east-west axis and come to the fore in many research and indexes (28, 38) The west of Türkiye is the developed and migration-receving region of the country. In our study, students who grew up in the rural areas, who have large families, and who statistically have more siblings are in the lower social class. Therefore, all these variables are secondary indicators of inequalities in health. Attitudes accepting DV seem to be more common among the mentioned people. These findings correlate with previous study results (10, 35, 39, 40). According to the results of previous studies, accepting attitudes towards domestic violence are more common among those who grew up in villages, those who live with an extended family, and those who have more siblings. There is a complex relationship between inequality and violence and socioeconomic structures play important roles in the formation of social relations in which violence takes place (41). As all these factors underline that inequalities in health are still valid and effective, we can overcome all types of violence by improving the related factors one by one (42).

The findings are concerning, and it is objectionable that future doctors and healthcare professionals have not heard of a public health problem. As lack of knowledge will prevent them from having the right attitude, all types of violence should be given wider coverage in psychology courses in the preclinical period for them to be aware in clinical practice. Their self-confidence should be increased by organizing problem-based training. In addition, prioritizing protective measures will be important to protect our future. Assuming that the prevalence of the problem in the community is higher than in health students, community-based screenings should be carried out to provide both social and medical support to the detected victims, and interventions aimed at children at earlier education levels should be implemented in schools to protect future generations. In addition, the correlational relationship between domestic violence and both perpetrating and being exposed to dating violence reveals that programs to prevent domestic violence or dating violence must be implemented with full determination and continuity.

Strengths and Limitations

Our study has limitations. The lack of random sample selection is one of the important limitations of the study. On the other hand, since the survey was delivered to the participants as an online form on a sensitive issue such as violence, more honest participation may have been obtained. Perceiving the questions as private may have prevented the correct answers. Recall bias can be talked about the questions including past experiences. In addition, since one-third of the participants have not heard of the concept of dating violence, prevalence values should be evaluated carefully.

The fact that the sample of the study was selected with a 99.9% confidence interval increases the power of the study. Additionally, awareness has been created in people who have heard the concept of dating violence for the first time.

While the attitudes of the participants who use or are exposed to dating violence in their current relationships are more in favor of approval, those who witness dating violence in their friends' circle have rejectionist attitudes toward dating violence. Since the rate of students who have never heard of dating violence is high, more awareness should be raised on this issue. Men who grew up in rural areas with multiple siblings in large families can be a target group for interventions. Consistent with previous studies, since those who witness domestic violence are more accepting of psychological dating violence, the attitudes of future generations toward dating violence can be improved by preventing domestic violence.

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Turkish adaptation and psychometric properties of the Short UPPS-P Impulsive Behavior Scale (S-UPPS-P)

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SUMMARY

Objective: This study aimed to adapt the Short UPPS-P Impulsive Behavior Scale (S-UPPS-P), which assesses five core dimensions of impulsivity (negative urgency, lack of premeditation, lack of perseverance, sensation seeking, and positive urgency), into Turkish and to evaluate its psychometric properties in a Turkish adult sample.

Method: The study was conducted with 304 adult participants aged 18–48. The adaptation process followed standard procedures, including translation, back-translation, and assessment of linguistic equivalence. Construct validity was examined using exploratory and confirmatory factor analyses. Discriminant and criterion validity were assessed using the Barratt Impulsiveness Scale-11 Short Form, the Brief Sensation Seeking Scale, and items evaluating impulsive behaviors in daily life. Reliability was evaluated via internal consistency and split-half methods.

Results: The five-factor structure of the S-UPPS-P was consistent with the original version and demonstrated excellent model fit in confirmatory factor analysis ($x^2/df = 2.40$, RMSEA =.07, CFI =.92). The scale showed high internal consistency (α=.85). S-UPPS-P scores were significantly associated with everyday impulsive behavior patterns, and correlations with the Barratt Impulsiveness Scale and the Brief Sensation Seeking Scale supported criterion validity.

Discussion: The Turkish version of the S-UPPS-P was found to be a valid and reliable tool for assessing multidimensional impulsivity in adults. By including the positive urgency dimension and offering a brief format, the scale provides a comprehensive yet time-efficient option for use in both research and clinical settings.

Key Words: Impulsivity, Scale Adaptation, Validity, Reliability, UPPS-P, S-UPPS-P

INTRODUCTION

Impulsivity is a multidimensional construct defined as the tendency to act without planning, to prefer immediate rewards, to act without considering consequences, and without considering potential risks (1,2). In addition to contributing to maladaptive decision-making in everyday life, it has been shown to play a critical role in several psychiatric disorders, including substance use disorders, attention-deficit/hyperactivity disorder (ADHD), and eating disorders (3,4,5). Behaviors such as loss of control while eating, unplanned shopping, and difficulty making or following plans have been reported to be linked to an individual's level of impulsivity (6,7). Moreover, impulsivity is also associated with behaviors such as aggression, anxiety, depression, a decline in academic performance, and risk-taking (8). Considering the reflections of impulsivity on daily life and its relationship with psychopathology, understanding and accurately measuring it is important (9). The measurement of impulsivity frequently involves the use of behavioral tasks (e.g., go-no-go task (10); balloon analogue risk task (11)) and self-report scales (e.g., Barratt Impulsiveness Scale (12); UPPS-P Impulsive Behavior Scale (13)). The literature demonstrates that conceptualizing impulsivity as a single factor is insufficient, and there is consensus that it represents a multidimensional construct (4). However, debate remains regarding the precise definitions and number of its dimensions. Due to the conceptual distinctions arising from definitions proposed and scales developed by different researchers, assessing impulsivity and comparing findings across studies is complicated (14,15,16).

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Whiteside and Lynam (3) developed the UPPS Impulsive Behavior Scale through a comprehensive analysis of existing scales designed to measure impulsivity. The name of the scale is an acronym from the initial letters of the English terms representing the four dimensions of impulsivity: Urgency, Premeditation, Perseverance, and Sensation Seeking (UPPS). This approach conceptualizes impulsivity as a higher-order construct that encompasses a wide range of behaviors and symptoms (4). Negative urgency refers to a tendency to act rashly when experiencing negative emotions. Lack of premeditation reflects a reduced tendency to consider the consequences of one's actions beforehand. Lack of perseverance reflects difficulty sustaining effort on long or monotonous tasks. Sensation seeking refers to the tendency to seek out novel and stimulating experiences.

The model developed by Whiteside and Lynam (3) initially encompassed impulsivity associated only with negative affect. Cyders et al. (17) later demonstrated that impulsivity is not limited to negative affect but can also emerge under positive emotional states, adding the "positive urgency" dimension to the existing impulsivity model, resulting in a five-factor conceptualization of impulsivity. Following this theoretical expansion, the 59-item UPPS-P Impulsive Behavior Scale was developed by Lynam et al. (13) based on this five-dimensional structure. Positive urgency refers to the tendency to act rashly when experiencing positive emotions. Research has shown that the five dimensions are interrelated to varying degrees, with the strongest associations typically observed between positive and negative urgency (18, 19, 20). Conversely, sensation seeking has consistently demonstrated comparatively weaker associations with the other dimensions. An increasing number of studies also indicate that the UPPS-P model has a strong and consistent factor structure (8,18,19,20).

The UPPS-P is one of the most comprehensive measures of impulsivity; however, the 59-item length of the scale makes it time-consuming to administer, which poses a considerable disadvantage, particularly for individuals with short attention spans, adolescents, and specific clinical groups (8). To address this limitation, shorter versions of the scale have been developed, among which the short French version developed by Billieux et al. (21) and the 20-item English short version developed by Cyders et al. (22) stand out. The Short UPPS-P (S-UPPS-P) is a brief and time-efficient instrument that assesses the five core dimensions of impulsivity while demonstrating psychometric properties comparable to the UPPS-P (21). In recent years, the scale has been adapted into several languages, including German (18), Japanese (23), Chinese (24), and Portuguese (8). It has been noted that impulsivity can be influenced by participants' sociodemographic characteristics (25,26) and that different dimensions of impulsivity may be more salient in different cultural contexts (8).

The original long form of the UPPS Impulsive Behavior Scale (3) has been adapted into Turkish by Yargıç et al. (27) for use with psychiatric patients. However, this adaptation was based on the four-dimensional model and did not include the updated five-dimensional structure. More recently, Eray et al. (28) examined the validity and reliability of the S-UPPS-P among adolescents aged 11–18 and demonstrated that it could successfully differentiate between the different dimensions of impulsivity in individuals diagnosed with ADHD. However, that study focused solely on the adolescent population, and the validity and reliability of the S-UPPS-P (21) have not yet been evaluated in the adult population. Therefore, the suitability of the short form for adults requires validation in this population. The purpose of the current study is to adapt the Short Form of the UPPS-P Impulsive Behavior Scale (S-UPPS-P) (21) to the Turkish adult population and to examine its psychometric properties. Accordingly, the aim is to provide the Turkish form of the S-UPPS-P that can be used as a valid and reliable measurement tool for both research and clinical use.

METHODS

Participants

The minimum required sample size was determined using a power analysis conducted with G*Power 3.1. Assuming a 95% confidence level, a significance level of .05, and a medium effect size of .30 (Cohen's f), the analysis indicated that 143 par-

ticipants would be sufficient. The study's sample consisted of 304 individuals from various provinces in Turkey, including 224 women and 80 men, aged between 18 and 48 years (M=22.38, SD=4.28). Data were collected both face-to-face (n=100) and online (n=204) using a convenience sampling method. In-person data were obtained from students at Dokuz Eylul University, while the online survey was shared via social media. When the groups were compared according to the data collection method, no significant difference was found between the total scale score (t(302)=-1.623, p= .106) and the sub-factors (t(302)=-.213 "negative urgency", -424 "lack of premeditation", .865 "lack of perseverance", -.583 "sensation seeking", -1.466 "positive urgency", p > .05). Therefore, the data from all participants were combined for analysis. The demographic characteristics of the sample are presented in Table 1.

Data Collection Tools

Data were collected using the demographic information form, Short UPPS-P Impulsive Behavior Scale (S-UPPS-P), and, for criterion validity, the Barratt Impulsiveness Scale-11 Short Form (BIS-11-SF) and the Brief Sensation Seeking Scale (BSSS-8).

Demographic information form: This form was designed to collect participants' basic sociodemographic information as well as lifestyle habits related to impulsive behaviors. Data included age, gender, education level, smoking and alcohol use, psychiatric diagnoses, and medication use (Table 1). In addition, several questions were included to capture daily behavioral patterns linked to impulsivity: (1) loss of control while eating and its frequency, (2) unplanned shopping tendencies, (3) frequency of weekly planning and adherence, and (4) frequency of unnecessary shopping. These items were added to enhance the construct validity of the scale.

Table 1. Demographic characteristics of the participants (N = 304)

Variables		Frequency (n)	Percentage (%)
Gender	Female	224	73.7
	Male	80	26.3
Education	High School Graduate	18	5.9
	Undergraduate Student	262	86.2
	Graduate Student	24	7.9
Psychiatric/psychological diagnosis	No	235	77.3
	Yes	69	22.7
Use of psychiatric medication	No	281	92.4
	Yes	23	7.6
Cigarette use	No	185	60.9
	Yes	119	39.1
Alcohol use	No	112	36.8
	Yes	192	63.2

Short UPPS-P Impulsive Behavior Scale (S-UPPS-P): The scale was originally developed by Billieux et al. (21) with 20 items and a 4-point Likert scale. The Turkish adaptation was conducted within the scope of the current study. Five different subscales of the S-UPPS-P indicating impulsive behaviors were measured on a Likert-type scale (1 = strongly agree, 4 = strongly disagree) and Cronbach's alpha internal consistency coefficients were determined: Negative urgency (4 items, α=.78), lack of premeditation (4 items, α=.84), lack of perseverance (4 items, α=.85), sensation seeking (4 items, α=.74), positive urgency (4 items, α=.72), and the total score of the scale (20 items, α=.85) was found (Table 2). The items in the "lack of premeditation" sub-dimension (Items 1, 6, 13, 19) and "lack of perseverance" sub-dimension (Items 5,8,11,16) are reverse-coded. The total scores that can be obtained from each sub-dimension of the scale range from 4 to 16, and the total score that can be obtained from the scale ranges from 20 to 80.

Barratt Impulsiveness Scale-11 Short Form (BIS-11-SF): The scale was developed by Barratt (29) and revised by Patton et al. (12). The validity and reliability study for the Turkish sample of the 4-point Likert-type and 15-item short form used in the study was conducted by Tamam et al. (30). The total score ranges from 15–60. The scale consists of 15 items and three subscales: attention impulsiveness (5), motor impulsiveness (5), and non-planning (5). According to the internal consistency analysis of the short form, Cronbach's alpha was .82 for the total score and .64–.80 for the subscales.

Brief Sensation Seeking Scale (BSSS-8): The scale was developed by Hoyle et al. (31) and adapted into Turkish by Çelik and Turan (32). It consists of eight items rated on a 5-point Likert scale (1= strongly disagree, 5= strongly agree). The Turkish version has a unidimensional structure, and no items are reverse-coded. Higher scores indicate greater levels of sensation seeking, whereas lower scores reflect lower levels. The Turkish adaptation study reported a reliability coefficient of .79 for the scale.

Procedure

Ethical approval for the study was obtained from the Dokuz Eylul University Social and Humanities Scientific Research and Publication Ethics Committee (Date: 26.04.2024, Decision Number: 14). Permissions to use all instruments included in the study were obtained from the relevant authors. Data collection was carried out between May and December 2024. Participants were informed about all stages of the research, and their consent was obtained.

In adapting the S-UPPS-P for the Turkish sample, the steps recommended by Erku (33) were followed. The English version of the scale (21) was translated by the research team and a translator; the translations were reviewed by a linguist against the original items, and the final version was established by the researchers. In the second stage, the Turkish items were back-translated into English by bilingual psychologists and a linguist. Another linguist compared the back-translation with the original form (21) and confirmed high overlap. Minor adjustments for cultural adaptation were made by the researchers. Finally, a high correlation was found between the English and Turkish forms in a test administered to 14 bilingual individuals ($r = .84$, $p < .001$).

Statistical Analysis

Analyses were carried out using SPSS 29.0 and R 4.4.3. Prior to the validity and reliability analyses, the dataset was examined for missing values, outliers, normality, and linearity. Z values remained within ±3.29 (34), and no missing data were found; all participants were included in the analyses. Skewness–kurtosis (±1.5) values and P–P and Q–Q plots indicated suitability for factor analysis (34). For construct validity, exploratory factor analysis (EFA) was conducted first: the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity were examined to evaluate sample adequacy; principal components analysis with varimax rotation was used, and factors with eigenvalues greater than 1 were reported. Confirmatory factor analysis (CFA) was then applied to confirm the discovered structure, and model fit was evaluated with goodness-of-fit indices (x^2/df, RMSEA, CFI, GFI, NFI, TLI, SRMR, AIC). In CFA, modification indices related to error covariances were considered when revising the model. To examine discriminant validity, independent-samples t-tests were used for intergroup comparisons; to examine criterion validity, Pearson correlations were calculated with the BSSS-8 and the BIS-11-SF, and correlations were also examined between S-UPPS-P scores and daily impulsive behaviors. Reliability was evaluated using Cronbach's alpha (internal consistency) and the split-half method. The significance level was set at .05 for all analyses.

RESULTS

Construct Validity: Factor Analysis

To examine the construct validity of the S-UPPS-P, an exploratory factor analysis (EFA) was conducted to determine whether the scale demonstrates a multidimensional structure. The model–data fit of the discovered structure was then evaluated using confirmatory factor analysis (CFA).

Prior to the EFA, the inter-item correlation matrix was examined, and the suitability of the data for factor analysis was evaluated with the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity. The KMO value was .82 and Bartlett's test was significant ($x^2 = 2695.69$; $df = 190$; $p < .001$), indicating that the sample was adequate for factor analysis (35). Using principal components analysis with varimax rotation, five factors with eigenvalues greater than 1 were obtained; no factor loading fell below .40 and no cross-loading items were identified. The five-factor structure explained 66.03% of the total variance and was consistent with the original scale.

According to the EFA, the first factor, "negative urgency", was represented by four items and explained 28.39% of the total variance; this dimension reflects a tendency to act rashly under negative emotions. The second factor, "lack of premeditation", characterized by reduced consideration of consequences before acting, explained 14.71% of the variance with four items. The third factor, "lack of perseverance" (9.56%), captures difficulty per-

sisting in and completing initiated tasks. The fourth factor, "sensation seeking", explained 7.04% of the variance with four items and reflects the tendency to pursue new and stimulating experiences. The fifth factor, "positive urgency", explained 6.32% of the variance with four items and refers to a tendency to act without thinking under positive emotions. The EFA findings are presented in Table 2.

To confirm the structure obtained with EFA, a measurement model was created, and CFA was applied. Model–data fit was assessed through various goodness-of-fit indices (36–38). At this stage, path analysis, fit indices, and modification suggestions were considered; in line with these suggestions, the error terms of Items 10 and 15, and Items 8 and 7, were correlated. As a result of the comparative analysis presented in Table 3, Model 2 was calculated as $x^2 = 365$, df = 152, $x^2/df = 2.40$, and this value indicated an excellent fit. RMSEA (Root Mean Square of Approximation) = .07, CFI (Comparative Fit Index) = .92, GFI (Goodness of Fit Index) = .98, NFI (Normed Fit Index) = .93, TLI (Tucker Lewis Index) = .90, SRMR (Standardized Root Mean Square Residual) = .07, and AIC (Akaike Information Criterion) = 12920 (Table 3). Taken together, these results show that the established measurement model provided a high level of fit (36).

To evaluate construct validity, participants were asked whether they experienced loss of control while eating, and their responses were compared with S-UPPS-P scores using independent-samples

Table 2. Exploratory Factor Analysis Factor Loadings for the S-UPPS-P

Items	Factor Loadings	Communalities	Item-Total Correlation	Mean	SD
Factor 1: Negative Urgency (Cronbach alpha= .78)					
4. When I am upset I often act without thinking.	.805	.649	.508	2.20	.972
7. In the heat of an argument, I will often say things that I later regret.	.491	.410	.437	2.14	.907
12. I often make matters worse because I act without thinking when I am upset.	.862	.751	.569	2.10	.923
17. When I feel rejected, I will often say things that I later regret.	.755	.580	.505	1.95	.929
Factor 2: Lack of Premeditation (Cronbach alpha= .84)					
1. I usually think carefully before doing anything.	.891	.730	.506	3.30	.628
6. My thinking is usually careful and purposeful.	.613	.655	.486	3.14	.734
13. I usually make up my mind through careful reasoning.	.853	.782	.584	3.20	.746
19. Before making up my mind, I consider all the advantages and disadvantages.	.809	.657	.446	3.17	.731
Factor 3: Lack of Perseverance (Cronbach alpha= .85)					
5. I generally like to see things through the end.	.439	.484	.513	3.49	.670
8. I finish what I start.	.814	.803	.500	3.11	.822
11. Once I start a project, I almost always finish it.	.894	.806	.471	2.80	.849
16. I am a productive person who always gets the job done.	.891	.806	.468	2.78	.865
Factor 4: Sensation Seeking (Cronbach alpha= .74)					
3. I sometimes like doing things that are a bit frightening.	.646	.668	.586	2.09	.912
9. I quite enjoy taking risks.	.798	.686	.566	2.26	.921
14. I generally seek new and exciting experiences and activities.	.698	.712	.630	2.71	.880
18. I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.	.765	.740	.639	2.82	.897
Factor 5: Positive Urgency (Cronbach alpha= .72)					
2. When I am really excited, I tend not to think on the consequences of my actions.	.413	.520	.434	2.54	.881
10. When overjoyed, I feel like I can□t stop myself from going overboard.	.591	.486	.437	2.28	.960
15. I tend to act without thinking when I am really excited.	.494	.653	.586	2.33	.885
20. When I am very happy, I feel like it is OK to give in to cravings or overindulge.	.777	.640	.598	2.65	.959

Note. S-UPPS-P: Short Form of the UPPS-P Impulsive Behavior Scale; SD: Standard deviation.

Table 3. Model Fit Indices for the S-UPPS-P

	x^2	df	x^2/df	CFI	GFI	TLI	SRMR	RMSEA	90% CI	AIC
Model 1	467	155	3.01	.88	.94	.85	.07	.08	.07;.09	13017
Model 2	365	152	2.40	.92	.98	.90	.07	.07	.06;.08	12920

Note. S-UPPS-P: Short Form of the UPPS-P Impulsive Behavior Scale; x^2: Chi-square; df: Degrees of freedom; CFI: Comparative Fit Index; GFI: Goodness-of-Fit Index; TLI: Tucker-Lewis Index; SRMR: Standardized Root Mean Square Residual; RMSEA: Root Mean Square Error of Approximation; 90% CI: 90% Confidence Interval; AIC: Akaike Information Criterion.

t-tests. Individuals reporting loss of control scored significantly higher on the total score and on all subscales (p<.05) except "sensation seeking". These results support the discriminant validity of the scale (Table 4).

Table 4. Comparison of S-UPPS-P subscale and total scores by presence of loss of control while eating

Have you ever experienced loss of control while eating?						
		N	*Mean*	*SD*	*t*	*p*
Negative Urgency	No	175	1.93	.64	-5.18	< .001
	Yes	129	2.35	.77		
Sensation Seeking	No	175	2.43	.68	-1.11	.270
	Yes	129	2.59	.66		
Positive Urgency	No	175	2.37	.64	-2.79	.006
	Yes	129	2.59	.70		
Lack of Premeditation	No	175	1.74	.54	-2.47	.014
	Yes	129	1.91	.63		
Lack of Perseverance	No	175	1.85	.65	-3.27	.001
	Yes	129	2.10	.68		
S-UPPS-P Total Score	No	175	2.06	.39	-4.67	< .001
	Yes	129	2.29	.46		

Note. S-UPPS-P: Short Form of the UPPS-P Impulsive Behavior Scale; SD: Standard deviation.

To further support construct validity, participants were asked questions related to eating, shopping, and planned behaviors, and the relationships between the answers given and the S-UPPS-P scores were examined with Pearson correlation analysis (Table 5). The frequency of loss of control while eating correlated positively with the total score and all subscales (p<.05) except "sensation seeking". Unplanned shopping correlated positively with all subscales (p<.05) except "lack of premeditation". The frequency of weekly planning correlated negatively with "lack of perseverance," "lack of premeditation," and the total score, whereas the level of adherence to plans correlated negatively with all subscales and the total score (p<.001). These findings indicate that the scale is consistent with everyday impulsive behaviors and demonstrates discriminant validity.

Criterion Validity

Criterion validity was evaluated via correlations with the BSSS-8 and the BIS-11-SF (Table 6). BSSS-8 scores correlated positively with the S-UPPS-P total score (r=.437, p<.001) and with each subscale, with the most notable association for "sensation seeking" (r=.646, p<.001); the lowest correlation was observed for "lack of perseverance" (r=.116, p<.05).

Significant positive correlations were observed between the BIS-11-SF non-planning subscale and the S-UPPS-P total score (r=.199, p < .001), "negative urgency" (r=.222, p< .001), "sensation seeking" (r=.179, p< .001), and "positive urgency" (r = .283, p< .001), but not with "lack of premeditation" or "lack of perseverance" (p>.05). The BIS-11-SF motor impulsiveness subscale correlated positively with the S-UPPS-P total score (r=.549, p<.001) and with all subscales. Within the attentional impulsiveness subscale, the strongest correlation was with "sensation seeking" (r = .269, p < .001); significant positive correlations were also found with "negative urgency" (r=.115, p<.05), "lack of premeditation" (r=.201, p<.001), and "positive urgency" (r=.166, p< .001), while correlations with the total score and with "lack of perseverance" were not significant (p> .05). Finally, the BIS-11-SF total score correlated positively with the S-UPPS-P total score (r=.342, p<.001), with significant correlations for all subscales except "lack of premeditation" (Table 6).

Table 5. Correlations between S-UPPS-P scores and everyday impulsive behaviors

	Negative Urgency	Lack of Premeditation	Lack of Perseverance	Sensation Seeking	Positive Urgency	S-UPPS-P Total Score
Frequency of loss of control while eating	.305**	.171**	.257**	.003	.146*	.268**
Unplanned shopping behavior	.192**	.108	.173**	.132*	.192**	.248**
Weekly planning frequency	-.082	-.263**	-.346**	.074	-.013	-.186**
Adherence to weekly plans	-.163**	-.307**	-.433**	-.127*	-.168**	-.283**

Note: *p < .05. **p < .001. S-UPPS-P: Short Form of the UPPS-P Impulsive Behavior Scale.

Table 6. Correlations Between S-UPPS-P Subscales and Other Measures of Impulsivity

	BSSS-8 Total Score	BIS-11-SF Non-Planning Impulsiveness	BIS-11-SF Motor Impulsiveness	BIS-11-SF Attentional Impulsiveness	BIS-11-SF Total Score
S-UPPS-P Total Score	.437**	.199**	.549**	.105	.342**
Negative Urgency	.196**	.222**	.509**	.115*	.308**
Lack of Premeditation	.179**	.066	.290**	.201**	.103
Lack of Perseverance	.116*	.005	.248**	.047	.143*
Sensation Seeking	.646**	.179**	.251**	.269**	.254**
Positive Urgency	.279**	.283**	.472**	.166**	.283**
BSSS-8 Total Score		.160**	.304**	.185**	.246**
BIS-11-SF Non-Planning Impulsiveness			.370**	.495**	.040
BIS-11-SF Motor Impulsiveness				.459**	.795**
BIS-11-SF Attentional Impulsiveness					.711**

Note: *p < .05. **p < .001. S-UPPS-P: Short Form of the UPPS-P Impulsive Behavior Scale; BSSS-8: Brief Sensation Seeking Scale; BIS-11-SF: Barratt Impulsiveness Scale-11 Short Form.

Reliability Analysis

The reliability of the S-UPPS-P scale was evaluated through the internal consistency coefficient (Table 2). Internal consistency for the 20-item total score was α=.85, which exceeds the conventional .70 criterion, indicating a good level of internal consistency (39). Cronbach's alpha coefficients for the subscales also indicated high reliability ["negative urgency" (α=.78), "lack of premeditation" (α=.84), "lack of perseverance" (α = .85), "sensation seeking" (α=.74), and "positive urgency" (α=.72)]. Item-deletion diagnostics indicated that removing any item would not increase reliability; therefore, the factor structure was retained. Split-half reliability further supported precision; the correlation between odd- and even-item halves was r = .83 (p<.001), yielding a Spearman–Brown coefficient of .91.

DISCUSSION

The purpose of this study was to adapt the S-UPPS-P scale into Turkish and to examine its validity and reliability in a Turkish sample. The exploratory factor analysis conducted with adults of varying ages was consistent with the original five-factor structure of the scale (21). The confirmatory factor analysis showed that the model demonstrated excellent fit (36). Cronbach's alpha coefficients above .70 for the total score and for each subscale support high internal consistency (39).

Findings regarding construct validity were examined using both exploratory and confirmatory factor analyses, and the resulting 20-item, five-factor structure was found to be consistent with the original instrument at both statistical and content levels. These findings align with validity and reliability studies conducted in diverse cultural contexts. In Western and Northern European countries, for example, studies in France (21), Sweden (40), Germany (18), Italy (41), Spain (42), and Hungary (43) have consistently replicated the five-factor structure; similar results have been reported in Eastern Europe (e.g., Poland (44)), in Asia (Japan (23), Iran (45)), and in Latin America (Brazil (8)). Together, these results suggest that the S-UPPS-P is a valid and reliable measure across cultures and that impulsivity can be assessed along five core dimensions. This supports not only local validity and reliability but also the cross-cultural measurement equivalence of the scale. However, the fact that the model obtained in Turkey required error correlations for some items is noteworthy in terms of cultural differences. Specifically, the need to correlate error terms between Items 10 and 15 and between Items 7 and 8 suggests that these items may carry overlapping meanings in the Turkish culture. The strong association observed between the "negative urgency" and "positive urgency" dimensions points to emotion-regulation difficulties as a salient indicator of impulsivity in this sample, consistent with previous studies (18-20). The results of the exploratory factor analysis indicated that the S-UPPS-P items loaded onto five factors with high factor loadings. Higher factor loadings indicate a stronger association between an item and its factor, and values .30 are generally considered sufficient (34). In the present analysis, the lowest loading was .41 (Item 2).

In the confirmatory factor analysis, the model was improved by correlating the error variances that the modification indices indicated would con-

tribute most to fit (46). A commonly used criterion is the ratio of the chi-square value to degrees of freedom (x^2/df). According to Hu and Bentler (38), a ratio below 5 is acceptable, and below 3 indicates an excellent fit. Additional fit indices include CFI, TLI, GFI, NFI, AIC, and RMSEA; RMSEA values .08, CFI/TLI/NFI .90 (47), and GFI .95 (47, 48) are typically considered acceptable or excellent. In the current study, the x^2/df ratio and GFI value indicated excellent fit, and the other indices were within acceptable ranges.

To evaluate construct and discriminant validity, relationships between S-UPPS-P scores and everyday behaviors (loss of control while eating, unplanned shopping, frequency of weekly planning, adherence to plans) were examined. Individuals reporting loss of control while eating scored significantly higher on the total score and on all subscales except "sensation seeking." Moreover, the frequency of loss of control while eating correlated positively with all subscales except "sensation seeking," a pattern consistent with prior work linking impulsivity to eating behaviors (6, 7). Unplanned shopping correlated positively with the total score and with all subscales except "lack of premeditation." Weekly planning frequency correlated negatively with "lack of perseverance," "lack of premeditation," and the total score, whereas adherence to plans correlated negatively with all subscales and with the total score. These findings indicate that the S-UPPS-P is sensitive to everyday impulsive behaviors and demonstrates discriminant validity.

Criterion validity was supported via correlations with the Brief Sensation Seeking Scale (BSSS-8; 32) and the Barratt Impulsiveness Scale–11 Short Form (BIS-11-SF; 30). Stronger associations were observed, in particular, for the BIS-11-SF non-planning and motor impulsivity subscales. The strong relationship between "negative urgency" and motor impulsivity supports the differentiation of impulsivity types relevant to impulse-control disorders (4,17). The S-UPPS-P subscales and total score were positively correlated with "sensation seeking", non-planning impulsivity, motor impulsivity, and overall impulsivity. Although attentional impulsivity was significantly associated with several subscales ("negative urgency," "sensation seeking," "lack of premeditation," "positive urgency"), it did not correlate with the total score. At the subscale level, "negative urgency," "sensation seeking," and "positive urgency" were related to non-planning, motor, and attentional impulsivity, whereas "lack of premeditation" was related to attentional and motor impulsivity. "Lack of perseverance" showed a positive correlation with motor impulsivity and with general impulsivity. Altogether, these patterns support both construct and criterion validity and indicate that the Turkish S-UPPS-P provides a reliable assessment.

An important finding of this study was that "sensation seeking" showed comparatively weaker associations with the other dimensions. This pattern is consistent with studies from different cultures (18, 19). In the literature, sensation seeking is described as relating less to impulse control per se and more to novelty- and excitement-seeking, which may manifest differently across cultural contexts (3, 22). Because different facets of impulsivity may become more prominent depending on cultural factors (8), we recommend that the Turkish findings on sensation seeking be examined in more detail, including cross-cultural comparisons along the individualism–collectivism dimension.

Reliability analyses indicated that Cronbach's alpha was .85 for the overall scale and ranged from .72 to .85 across subscales. These values indicate adequate internal consistency (39) and are consistent with reliability coefficients reported in previous studies (21,22).

Nevertheless, this study has limitations. First, due to convenience sampling, generalizability to the broader adult population is limited. Second, exclusive reliance on self-report can introduce social desirability and response biases, and the automatic nature of impulsive behaviors may make accurate self-reflection difficult. Finally, validity analyses were conducted with behavioral tendencies rather than with clinically diagnosed groups. Therefore, further studies in clinical samples are needed to establish clinical validity and to determine cutoff scores.

In conclusion, in light of the validity and reliability analyses, the Turkish version of the S-UPPS-P (21)

is evaluated as an effective and psychometrically sound tool for measuring the five dimensions of impulsivity. The 45-item, four-subscale version of the scale was adapted into Turkish by Yargıç et al. (27), and the current short form was adapted by Eray et al. (28) for adolescents aged 11–18. Adapting the short version with 20 items and five factors for a Turkish adult sample in the current study shortens administration time and facilitates use. Furthermore, inclusion of the positive urgency dimension allows for a multidimensional assessment of impulsivity. In this respect, it provides a time-efficient assessment tool that is particularly useful in psychiatric evaluations and in clinical and health psychology practice. The preservation of distinct factor structures across the S-UPPS-P subscales allows both the systematic examination of individual differences in research settings and more detailed analyses in clinical evaluations. Disseminating the Turkish-adapted short form by testing it in different populations and cultural groups will make a significant contribution to future research.

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The invisible wounds of supporting trauma survivors: Rethinking secondary traumatic stress

A narrative review of conceptual and practical challenges

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SUMMARY

Secondary traumatic stress (STS) is an increasingly recognized mental health concern among professionals working with trauma survivors. Although STS shares symptomatic overlap with post-traumatic stress disorder (PTSD), its etiology is rooted not in direct trauma exposure but in empathic engagement with traumatized individuals in the course of professional responsibilities. This crucial conceptual distinction is often neglected in both the mental health literature and clinical settings. This narrative review explores the theoretical underpinnings, diagnostic challenges, and psychosocial consequences of STS, with a particular focus on professionals operating in disaster zones. Drawing on models such as compassion fatigue, vicarious traumatization, and ecological frameworks, the review conceptualizes STS as an outcome of the dynamic interaction between individual vulnerability, professional exposure, and contextual stressors. Risk factors are discussed across three levels: individual (e.g., young age, female gender, personal trauma history), occupational (e.g., lack of supervision, limited field experience), and event-based (e.g., exposure to emotionally intense cases, witnessing grief and loss). Despite the growing empirical interest in STS, much of the existing literature is based on cross-sectional designs and lacks culturally adapted assessment tools with robust psychometric properties. Furthermore, STS is frequently treated solely as a clinical condition, while its structural and ethical implications for professional sustainability and care quality remain underexamined. This review highlights the necessity of addressing STS as a systemic occupational risk that requires early recognition, theoretical clarity, culturally sensitive screening instruments, and institutional-level interventions such as trauma-informed supervision and workload support. A comprehensive understanding of STS, informed by multidimensional models and longitudinal data, is critical to safeguarding the mental well-being of professionals exposed to secondary trauma.

Key Words: Stress disorders, post-traumatic, empathy, occupational stress, disasters.

INTRODUCTION

Secondary traumatic stress (STS) is a form of psychological distress that may develop in individuals who are not directly exposed to a traumatic event, but who witness, assist with, or become emotionally involved in the event through empathic engagement (1). This phenomenon differs from primary traumatic stress responses seen in direct trauma victims and emerges through the caregiver's sense of responsibility, valuing of the person, and intense empathic interaction (2,3). Figley (2002, p. 143) described this condition as follows (4): *"We have not been directly exposed to the trauma scene, but we hear the story told with such intensity... and we suffer."*

STS was systematically defined in the 1990s through the work of Charles Figley, who emphasized that ongoing exposure to others' trauma can lead to psychological outcomes such as compassion fatigue and the "cost of caring," especially among professionals in helping fields (5). During this period, it was noted that STS presents with symptoms similar to post-traumatic stress disorder (PTSD), but arises from indirect exposure to trauma.

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In the 2000s, the prevalence of secondary traumatic stress among professionals working with trauma survivors gained attention (4). Large-scale crises such as natural disasters and terrorist attacks highlighted the mental health impact on helping professionals (6). More recently, the COVID-19 pandemic has brought indirect traumatic experiences of healthcare workers to light, revealing widespread manifestations of STS, compounded by personal and systemic stressors (7). In this context, STS has come to be addressed not only as a clinical issue but also as a structural one, bringing preventive intervention strategies into focus alongside discussions of psychological resilience, burnout, and occupational sustainability.

Professionals who serve trauma survivors—such as healthcare workers, search-and-rescue teams, social workers, police officers, firefighters, and lawyers—may experience indirect stress reactions even if they are not directly exposed to the trauma (8). Depressive symptoms and STS have been frequently reported in these groups (2,9-11). However, not every individual develops a PTSD-like disorder, and symptoms vary depending on personal factors.

In large-scale traumatic events such as disasters, STS occupies a unique position. By their very nature, disasters may expose not only victims but also aid workers to trauma, either directly or indirectly.

Professionals deployed or volunteering in disaster areas are often required to work under complex and ambiguous conditions that may include their own trauma histories (1).

Research on STS has shown this form of stress to be prevalent particularly among healthcare workers, social workers, and first responders (4,6,11). Nevertheless, there remain significant gaps in the literature regarding conceptual frameworks and measurement methods. For example, while Figley (1995) defines STS as a response developing from empathic engagement, McCann and Pearlman (1990) describe a similar phenomenon as "vicarious traumatization," emphasizing cognitive schema disruptions (12,13). These two perspectives differ in terms of intervention strategies, contributing to diagnostic and theoretical ambiguities in the field. In addition, the boundaries between STS and burnout remain unclear. Some studies use these terms interchangeably or confuse them (10).

Moreover, there is a noticeable lack of longitudinal studies exploring the long-term effects of STS; most existing research is cross-sectional in design (14). Cross-cultural variations have also been insufficiently examined; there is limited knowledge about how STS is experienced in different cultural contexts (15). These shortcomings underscore the need to approach STS through a multidimensional, culturally sensitive, and integrative framework.

Although secondary traumatic stress has gained increasing recognition over the past two decades, it remains a conceptually and diagnostically debated phenomenon. Overlaps and conceptual confusions among related constructs—such as PTSD, burnout, vicarious traumatization, and compassion fatigue—lead to inconsistencies in both clinical understanding and research findings. Furthermore, the lack of standardized diagnostic criteria and the inconsistent use of measurement tools hinder the identification of STS, particularly in high-risk professional groups such as mental health workers exposed to indirect trauma, and complicate effective interventions.

This narrative review aims to examine the concept of STS through a critical and integrative lens, synthesizing the existing literature to clarify the conceptual boundaries, diagnostic challenges, and associated risk and protective factors of this phenomenon. Within this framework, the review places special emphasis on disaster-based mental health services as a context in which STS symptoms, although often pronounced, frequently go unrecognized. By identifying gaps in the literature and highlighting unresolved clinical and theoretical issues, this review seeks to contribute to the development of more accurate assessment strategies and targeted intervention approaches for addressing secondary trauma in mental health professionals providing psychosocial support.

Understanding secondary traumatic stress: Conceptual, diagnostic, and clinical dimensions

Secondary Traumatic Stress: Definition, clinical symptoms, and diagnostic boundaries

Symptoms of post-traumatic stress disorder (PTSD) may occur not only in cases of direct exposure to traumatic events but also in situations involving indirect exposure, such as witnessing the event, learning that it has occurred, or establishing a professional helping relationship with trauma survivors (8). The psychological condition that develops as a result of this type of indirect exposure is referred to as secondary traumatic stress (STS). STS symptoms resemble the core features of PTSD, such as re-experiencing, avoidance, and increased arousal (16).

The relevant literature shows that the risk of developing STS is particularly high among professionals who work closely with trauma (9, 10). Moreover, it has been reported that following collective traumas, the number of individuals secondarily traumatized may exceed the number of those directly affected. For example, during a natural disaster, the physical injury of one person may lead to psychological distress in approximately 200 others who were not directly exposed to the event (17).

STS symptoms may include re-experiencing, intrusive cognitive content, nightmares related to the trauma, hyperarousal, and avoidance behaviors, as seen in PTSD. However, the defining characteristic of STS is that the traumatic event is not directly experienced by the individual, but is associated with the traumatic experience of someone they are helping (18). This results from the helper being emotionally affected through an empathic bond with the trauma survivor.

In STS, a perception of threat is present; however, unlike PTSD, this threat is not directed toward the helper themselves. Rather, the threat is associated with the experience of someone in their immediate environment, such as a client or person they are assisting. For example, a healthcare worker supporting a client who lost a limb in a traffic accident may experience intrusive recollections of the event, repeatedly see scenes of the accident in their dreams, feel as though they personally lived through the event, or experience intense distress when confronted with reminders. Search and rescue teams working in earthquake zones may develop avoidance behaviors related to the moment of rescue, have difficulty recalling aspects of the intervention, express emotional numbing or a loss of interest. In addition, they may have trouble falling or staying asleep, exhibit hyperarousal, sudden anger outbursts, or problems with concentration (18).

Secondary traumatic stress is not currently a formally recognized psychiatric diagnosis, and there are no standard diagnostic criteria specific to this condition. In primary traumatization and PTSD, the individual is exposed to an event involving actual or threatened death, serious injury, or sexual violence, either directly, by witnessing it, by learning that it occurred to a close other, or through repeated exposure to disturbing details of traumatic events. In contrast, in STS, the life-threatening experience is directed at the trauma survivor—who may be a victim, patient, or client. The individual experiencing STS is typically someone in a helping role—such as a social worker, therapist, healthcare professional, journalist, volunteer, or legal advocate—who forms an empathic relationship with the survivor. Exposure to traumatic content occurs not directly but in an indirect and repeated way through the helping relationship.

Re-experiencing symptoms can be observed in both primary and secondary traumatization. These may include involuntary and distressing memories, nightmares, dissociative flashback episodes, and intense psychological or physiological responses triggered by trauma-related cues. In STS, these symptoms are centered not on the individual's own trauma, but on the trauma experienced by the person they are assisting. Avoidance symptoms, similar to those seen in PTSD, can also occur in STS. These may involve efforts to suppress trauma-related thoughts, avoiding people, places, or situations associated with the trauma, diminished interest, a sense of detachment, and pessimism about the future. Hyperarousal symptoms may include difficulty falling or staying asleep, irritability, sudden anger outbursts, distractibility, hypervigilance,

exaggerated startle response, and physiological arousal. These symptoms have been reported in both primary and secondary trauma exposure (19).

One important distinction between the two conditions lies in the duration criterion. While PTSD requires symptoms to persist for at least one month to meet diagnostic criteria, no such duration threshold exists for STS (19). STS symptoms generally emerge quickly and in connection with a specific traumatic event. Acute stress reactions similarly appear within a short time frame, whereas PTSD symptoms may emerge with a delayed onset. However, in all of these conditions, the symptoms cause clinically significant distress and impairment in social, occupational, or other important areas of functioning (20).

In cases of primary traumatization, functional impairment may manifest as increased family conflict, sexual dysfunction, social withdrawal, increased substance use, diminished emotional connectedness, and loss of social support. On the other hand, functional disruptions caused by STS may include workplace conflict, inability to complete tasks, emotional numbing toward survivors, ongoing distress due to repeated exposure to traumatic content, loss of social support, and difficulty coping with stress (2, 19).

The psychological and occupational toll of secondary traumatic stress

Secondary traumatic stress (STS) has multifaceted effects not only on an individual's mental health but also on their occupational functioning and overall physical condition. In the literature, the effects of STS are generally categorized under three main domains: emotional, physical, and professional (21, 22).

On the emotional level, individuals exposed to STS may experience various symptoms, including anxiety, depression, anger, fear, guilt, loss of trust, emotional numbness, feelings of inadequacy, social withdrawal, avoidance behaviors, heightened sensitivity to violence, and changes in perception and memory (21). These symptoms can lead to significant disturbances in both the individual's inner emotional world and interpersonal relationships.

Physical symptoms associated with STS include headaches, gastrointestinal discomfort, muscle tension, chronic fatigue, sleep disturbances, and cardiac problems. In particular, decreased sleep quality and insufficient rest can directly affect both mental well-being and occupational performance (21,23).

The occupational impact of STS is as significant as its emotional and physical consequences. Among helping professionals, common outcomes include avoidance of empathic engagement with clients, reluctance to attend work, loss of motivation, feelings of burnout, and difficulty completing tasks (21, 22). It has also been reported that individuals experiencing high levels of STS may show impaired decision-making capacity, reduced professional motivation, and desensitization toward traumatic content (24). These effects can negatively impact both personal job satisfaction and the overall quality of services provided.

In the long term, STS can also have serious consequences for workforce sustainability. Employees with high levels of STS symptoms have been found to leave their jobs at higher rates, with particularly high turnover observed in the healthcare sector (25). Therefore, STS should be understood not only as an individual-level concern but also as a systemic professional risk factor that requires organizational attention.

Assessment tools for secondary traumatic stress

Among the most widely used tools for assessing secondary traumatic stress (STS) are the Secondary Traumatic Stress Scale (STSS) and the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). The STSS was developed by Bride et al. (2004) based on Figley's theoretical framework and was specifically designed to evaluate symptoms experienced by helping professionals. This scale, grounded in DSM-IV criteria, covers symptom clusters such as re-experiencing, avoidance, and arousal (26). The PCL-5, on the other hand, is a 20-item self-report scale adapted to the updated diagnostic criteria of DSM-5, and it is sensitive not only

to direct trauma but also to secondary trauma (27). Both scales have undergone validity and reliability studies in various cultural contexts; however, some findings suggest that these instruments may not be sufficiently sensitive to symptom expression in certain cultural settings. For example, in the Turkish adaptation of the PCL-5 used among disaster survivors, relatively high cutoff scores were reported, which was suggested to be linked to cultural styles of symptom expression (28). Cultural differences may influence both the meaning attributed to traumatic experiences and the linguistic and behavioral expression of symptoms, potentially reducing the diagnostic sensitivity of assessment instruments. Therefore, it is important to critically examine the cultural validity of the tools used to assess STS and to adapt them according to local needs.

Distinguishing related concepts: Vicarious trauma, burnout, and compassion fatigue

In describing work-related psychological impacts, the terms secondary traumatic stress (STS), vicarious traumatization, compassion fatigue, and burnout are frequently used. It is now understood that individuals who provide services to trauma survivors may also experience negative psychological changes as a result of indirect exposure to trauma (8). Although these terms are sometimes used interchangeably, they carry different meanings. Therefore, it is important for professionals working with trauma to clarify the conceptual boundaries of each (18). The concept of secondary traumatic stress emphasizes the emotional and behavioral changes that occur upon acquiring knowledge of another person's traumatic experience. Through indirect contact with traumatic events, individuals may develop PTSD-like symptoms (12). However, some studies have found high levels of correlation among these concepts, suggesting that it may be difficult to distinguish them empirically.

Vicarious traumatisation

This concept was first defined in 1990 (13). While secondary traumatic stress involves changes primarily in emotions and behaviors, vicarious traumatization emphasizes alterations in cognitive processes (29). The literature indicates that there is conceptual confusion between these two terms (18). Both concepts may be observed among professionals working with individuals who have experienced traumatic events (10). For example, professionals working with trauma survivors may develop mistrust toward others or experience negative shifts in their cognitive schemas—hallmarks of vicarious traumatization (13). These individuals may exhibit changes in their worldview, perceptions of psychological needs, and memory processes. This phenomenon is considered a cumulative and almost inevitable consequence of engaging in empathic professional relationships. The concept was introduced within the framework of the Constructivist Self Development Theory, which identifies cognitive schema domains such as safety, trust, esteem, intimacy, and control as being particularly vulnerable to the impact of traumatic experiences.

Whereas STS symptoms tend to emerge acutely, vicarious traumatization is associated with cumulative effects resulting from chronic exposure. From a prognostic standpoint, recovery from secondary traumatic stress may occur more quickly, while treatment for vicarious trauma often requires a longer process (12). Whereas STS symptoms tend to emerge acutely, vicarious traumatization is associated with cumulative effects resulting from chronic exposure. From a prognostic standpoint, recovery from secondary traumatic stress may occur more quickly, while treatment for vicarious trauma often requires a longer process (10).

Burnout

Burnout is described as a specific type of occupational stress that arises from prolonged exposure to emotionally intense and interpersonally demanding work environments (30, 31). Factors such as excessive workload, time-related pressures, and the challenging nature of the work environment contribute to the development of burnout (30). It reflects a chronic dissatisfaction with professional conditions (32).

While burnout typically follows a cumulative pattern, secondary traumatic stress may develop acutely, even in response to a single traumatic incident (12). From a prognostic perspective, se-

Table 1. Comparison of concepts related to secondary traumatic stress

	Secondary Traumatic Stress	Vicarious Trauma	Burnout	Compassion Fatigue
First Defined by	Figley (1995)	McCann & Pearlman (1990)	Maslach (1981)	Joinson (1992); Figley (2002)
Cause	Indirect exposure to traumatic events via empathy	Indirect exposure to trauma + chronic empathic burden + disruption of meaning systems	Interpersonal stress and adverse work conditions - excessive workload, lack of control, low reward - more related to chronic stress than trauma	Continuous display of compassion and empathy - Empathy + intense caregiving effort
Affected Individuals	Professionals working with trauma survivors	Professionals working with trauma survivors	Any occupational group	Professionals providing care to chronically ill individuals
Impact	Emotional and behavioral changes (re-experiencing, avoidance, hyperarousal)	Cognitive and belief changes (negative transformations)	Dissatisfaction, emotional exhaustion, decreased productivity	Linked to depletion of internal resources - reduced tolerance and inclusiveness
Prognosis	Acute onset, rapid course, high reversibility	Often chronic, resistant, low reversibility	Cumulative - chronic stress, moderate to low reversibility	Chronic, moderate to high reversibility

condary traumatization tends to have a more favorable course than burnout, as it may present acutely and resolve more rapidly (12). The etiology of burnout is generally explained by occupational factors, whereas secondary traumatic stress is more directly associated with exposure to traumatic experiences (32). In terms of professional groups, secondary traumatic stress is more commonly observed among those working directly with traumatized individuals. In contrast, burnout can occur across a wide range of professions, particularly those involving high interpersonal demands and difficult working conditions (12,33).

Compassion fatigue

There are costs associated with providing care to individuals with chronic illnesses. Caregivers strive to remain professionally objective while simultaneously aiming to deliver the best possible care. On the other hand, the compassion and empathy they feel enable a deeper understanding of the individual, thereby improving the quality of care. Compassion refers to the ability to tolerate the suffering of others. Empathy functions as a motivating factor for engaging effectively with pain. Although compassion, empathy, and mercy can be motivating in the provision of care, they also come with costs. The continuous demonstration of compassion and empathy depletes internal resources and leads to compassion fatigue. This results in a decreased capacity to tolerate the suffering of others and to remain emotionally responsive—effectively reversing the motivational functio (4). Individuals experiencing compassion fatigue may have difficulty attending work or may experience persistent thoughts centered around their patients. Difficulties in maintaining work performance are prominent in compassion fatigue (19). Secondary traumatic stress and occupational burnout are considered subcomponents of compassion fatigue (34).

Theoretical models explaining secondary traumatic stress

The development of secondary trauma has been explained through various theoretical perspectives. One of these is the concept of energy depletion. Figley and Kleber (1995) stated that the core of STS lies in the burden created by sustained empathy, leading the helper to experience exhaustion both physically and psychologically. A person trying to support a trauma survivor may feel fatigue at both levels. Within this framework, the Energy Depletion Model emphasizes how the motivation to help can become increasingly taxing and draining over time (12).

Another theoretical explanation focuses on the close relationship with the victim. Individuals closely connected to the trauma survivor may also be psychologically affected. The intensity of the traumatic event and feelings of helplessness may also be experienced by the person providing support.

An empathic attitude toward the trauma survivor is a triggering factor in this process. When the traumatic experience is internalized by the support person, the closeness becomes burdensome. The individual may lose their empathic capacity and feel depleted (12). While empathy is necessary for therapeutic connection, when left unchecked, it can become emotionally consuming. Therefore, it is recommended that helpers approach clients first with empathy, then shift to objectivity, and return to empathy as needed (35).

Secondary traumatic stress has also been explained through a resilience-based process model (36). This model is described through a three-part structure: first, empathic engagement; second, secondary traumatic stress; and third, resilience against secondary traumatic stress disorder. In the first component, empathic engagement, elements such as contact with the trauma survivor's suffering, empathic concern and compassion, the ability to empathize, and empathic responses play a role. In the second component, secondary traumatic stress, the emphasis is placed on the perceived threat resulting from exposure. In the third component, resilience, factors such as self-care, psychological distancing from the survivor's pain, a sense of fulfillment, and social support are considered influential. Practicing self-care may help reduce the negative impact of secondary trauma (36).

The ripple effect describes how a traumatic event first affects the person who experiences it directly, and then radiates outward, impacting those around them (37). Family members, friends, and professionals who are close to the primary victim may also develop secondary trauma symptoms. In large-scale societal traumas, the number of secondarily traumatized individuals may exceed the number of those directly affected (17).

The chiasma effect is another concept used to explain the development of secondary trauma. "Chiasma" refers to an X-shaped crossover and is used in biology to describe the exchange of genetic material between chromosomes. Similarly, the concept highlights the transfer of traumatic experiences. For example, parents who are aware of the traumatic experiences of their children may be more deeply affected than the children themselves (38). Likewise, professionals working directly with trauma survivors who feel a strong sense of responsibility may experience higher levels of traumatic stress (39).

The ecological perspective, a foundational principle in social work, posits that individuals are interconnected with their environments. According to this view, any event occurring in one's environment may directly impact the individual. As a result, the trauma experienced by one person may also affect their family, friends, social support systems, and the professionals offering help—leading to secondary trauma (20).

A key feature in the formation of STS is the knowledge of the traumatic event itself (2). Through empathy, the helper may develop feelings similar to those experienced by the trauma survivor. As the event is cognitively represented, the helper may experience re-experiencing symptoms. The theoretical foundations of STS were first systematically introduced by Figley (1995, 2002), who defined STS as a distinct syndrome that may emerge in helping professionals following empathic engagement with trauma survivors. His Compassion Fatigue Model describes STS as a component of empathy-based burnout and incorporates this into the theoretical framework of STS (4,12). In addition, Figley's (1995) Secondary Traumatic Stress Contagion Model suggests that in therapeutic contexts, traumatic content may be emotionally "transmitted" to the helper through empathic listening (5, 12).

On the other hand, several theoretical approaches that do not directly define STS but explain similar psychological processes also appear in the literature. For example, McCann and Pearlman's (1990) Vicarious Traumatization Theory focuses on how prolonged helping relationships may disrupt an individual's cognitive belief systems, such as trust, control, and self-worth (13). Lazarus and Folkman's (1984) Stress Process Model investigates the balance between environmental demands and individual coping resources to explain variations in stress responses, indirectly contributing to the understanding of STS (40). In addition, the

Professional Quality of Life (ProQOL) Model developed by Stamm (2005) provides a multidimensional assessment tool that directly measures STS and considers both compassion fatigue and compassion satisfaction (41). These models, either directly or indirectly, contribute to the theoretical understanding of STS initiated by Figley.

Individual, occupational, and event-based risk factors in the development of secondary traumatic stress

Secondary traumatic stress (STS) may diminish rapidly in some individuals, but in certain cases, it can become more persistent, negatively impacting mental health and overall life functioning (42). This variability is largely influenced by the individual's personal history, psychosocial resources, and occupational conditions. Recent studies have shown that the development of STS is shaped by multidimensional and interactive factors.

Individual risk factors

Individual characteristics that increase vulnerability to secondary traumatic stress (STS) include age, gender, personality traits, previous traumatic experiences, level of social support, quality of family relationships, coping strategies, and overall mental health status (8, 42). Some studies have indicated that being female, younger in age, and having less professional experience may constitute risk factors for STS (43-45). Similarly, a study conducted among psychosocial support workers deployed to disaster zones found that younger age and low psychological resilience significantly increased STS symptoms (46). Awareness of one's own psychosocial support needs has also been reported to be associated with higher stress levels. Furthermore, individuals with a history of traumatic experiences may be more sensitive to trauma encountered in professional settings (43).

Occupational and organizational risk factors

The emergence of secondary traumatic stress (STS) is influenced not only by individual factors but also by occupational and organizational contexts. In this regard, variables such as years of professional experience, frequency of exposure to trauma-related cases, clarity of professional role, received training, level of organizational support (e.g., supervision, team support), availability of psychosocial resources in the workplace, and relationships with colleagues are among the key factors affecting STS levels (44, 45). It has been reported that less experienced personnel are more susceptible to STS, and that a supportive institutional culture may help reduce this risk (47). In particular, lack of supervision, insufficient organizational support, and avoidance-based coping strategies have been identified as prominent factors increasing STS levels.

Event-based and task-based risk factors

In the development of secondary traumatic stress (STS), not only personal and occupational variables, but also the nature of events encountered during duty plays a significant role. Exposure to situations involving direct or indirect threats, loss of clients during care, emotionally overwhelming cases, inadequate physical conditions, time pressure, high expectations, and lack of social support networks are among the event-related sources of stress (48). Such conditions may intensify the stress responses of professionals who are exposed to traumatic content, thereby increasing the risk of STS. These findings indicate that STS does not emerge solely due to individual vulnerability but rather through the interaction of professional context, organizational environment, and event-based stressors. Therefore, it is essential to address both individual and structural levels when developing preventive strategies.

Addressing STS in disasters: PTSD or STS?

When evaluating the psychological burden of professionals working in disaster zones, the distinction between post-traumatic stress disorder (PTSD) and secondary traumatic stress (STS) is critical, yet often overlooked. PTSD develops as a result of direct exposure to traumatic events. Although STS presents with similar symptoms—such as intrusive thoughts, hyperarousal, and avoidance behaviors—it arises from indirect exposure through empathic engagement with trauma survivors (12).

This distinction becomes especially important in disaster contexts. In such settings, professionals encounter trauma not only environmentally, but also by bearing witness to the suffering of others in a deeply personal way. i man et al. (2025), in their study with psychosocial support workers deployed after the 2023 Türkiye earthquakes, emphasized this distinction. They demonstrated that forms of indirect exposure—such as accompanying a bereaved relative to a funeral or working with individuals who experienced limb loss—were stronger predictors of traumatic stress symptoms than direct exposure to morbid scenes (46). These findings suggest that although professionals in disaster zones may face the possibility of direct trauma exposure, it may be more appropriate to conceptualize their psychological responses within the framework of STS rather than PTSD, especially for those in helping relationships with trauma survivors. Similarly, Tominaga et al. (2020) reported high levels of STS symptoms among clinicians in Japan following the 2011 Tohoku earthquake, particularly among those working with grieving children and families (49).

Taken together, these findings highlight the need for a more nuanced approach in disaster-related mental health interventions. Interventions based solely on PTSD models may not adequately capture mission-specific challenges and empathic vulnerability. Furthermore, the unique nature of the field—which carries risks of both primary and secondary traumatic stress—must be considered. Thus, evaluating these responses solely through the lens of PTSD may obscure critical distinctions in terms of etiology, clinical course, and intervention strategies.

DISCUSSION

Although there are notable findings in the literature regarding the prevalence of secondary traumatic stress (STS) among mental health professionals working in disaster zones, significant research gaps remain in this field (46). It has been reported that, in the aftermath of disasters, these professionals may develop STS symptoms due to continuous exposure to others' traumatic experiences. However, because most existing studies employ cross-sectional designs, methodological limitations arise in establishing causal relationships (44,49).

Moreover, many studies address STS without clearly distinguishing it from related constructs such as burnout, post-traumatic stress disorder (PTSD), and compassion fatigue.This leads to both diagnostic ambiguities and reduced specificity in intervention strategies (5). Factors such as variability in measurement tools, limited cultural validation studies, and the occupational homogeneity of samples further restrict the comparability of findings across different studies.

Nonetheless, some consistent patterns are noteworthy. Female gender, younger age, and lower levels of professional experience have been identified as key risk factors for STS among mental health professionals working in post-disaster settings (43, 45, 46). In addition, occupational experiences such as direct exposure to trauma or witnessing intense traumatic narratives have been shown to significantly increase STS levels (46,49).

On the other hand, protective factors such as social support, perceived professional competence, and trauma preparedness training have been shown to reduce STS symptoms in various contexts (50). However, there are very few studies that systematically examine the impact of these protective factors on psychosocial support personnel working under disaster conditions. Furthermore, the simultaneous exposure to both primary and secondary trauma among these professionals complicates the conceptual and diagnostic distinction between the two clinical presentations (5,49).

Future research should employ longitudinal designs that simultaneously assess primary and secondary trauma exposure while also being sensitive to cultural context. In addition, the development of psychometric tools that can specifically measure STS and distinguish it from related constructs in disaster contexts will enhance conceptual clarity and contribute to the targeted design of intervention programs.

This review highlights the critical importance of

secondary traumatic stress (STS) among mental health professionals working in disaster settings. Although STS shares symptomatology with post-traumatic stress disorder (PTSD), its etiology—rooted in empathic engagement and indirect trauma exposure—necessitates a distinct conceptual, diagnostic, and interventional approach. The existing literature suggests that STS is not merely an individual clinical condition but also a structural occupational risk, with serious implications for service quality, ethical care, and workforce sustainability.

From a clinical perspective, early recognition of STS and its differentiation from similar conditions is essential to prevent the chronicity of psychological burden. At the institutional level, the integration of trauma-informed supervision, strengthening of organizational support mechanisms, and implementation of targeted training programs are among the evidence-based strategies that enhance professional resilience.

Therefore, future research should prioritize the development of culturally sensitive and psychometrically sound assessment tools capable of distinguishing STS from related constructs. Furthermore, mixed-method and longitudinal study designs will significantly contribute to understanding the complex interactions between personal vulnerability, occupational exposure, and structural protective factors. Only through such a comprehensive approach can the psychosocial burden faced by disaster-exposed professionals be effectively addressed at clinical, organizational, and policy levels.

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Author Contributions

E.S. conducted the literature review and drafted the manuscript. A.G. revised the manuscript for language and clarity. A.P. supervised the writting process and critically reviewed the manuscript. All authors contributed to the conceptualization, approved the final version, and are accountable for its content.

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This narrative review did not involve human participants or animal subjects and therefore did not require ethical approval.

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Primary central nervous system lymphoma presenting with psychiatric symptoms: A case report

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SUMMARY

Primary central nervous system lymphoma (PCNSL) is an uncommon type of non-Hodgkin lymphoma confined to the central nervous system, presenting with diverse clinical manifestations, including neuropsychiatric symptoms. This case report describes the diagnostic process of PCNSL in a 76-year-old patient with bipolar disorder type II, who had been in long-term remission, presenting with a depressive episode accompanied by rapidly progressive cognitive impairment and psychotic symptoms following a sudden and traumatic personal loss. The case highlights the challenges in diagnosing PCNSL when psychiatric symptoms dominate the clinical presentation. Additionally, potential risk factors for PCNSL, the association between tumor characteristics and neuropsychiatric symptoms, as well as current insights into prognosis, have been reviewed to facilitate the planning of a multidisciplinary treatment approach.

Key words: Brain tumor, primary central nervous system lymphoma, psychiatric symptoms, neuroimaging

INTRODUCTION

Brain tumors are rare diseases that account for approximately 1.6 percent of all other tumors. Brain tumors usually present with non-specific (headache, weight loss, nausea, dizziness etc.) or focal neurological symptoms (motor deficits, seizures, urinary incontinence, ocular impairments etc). Focal neurological symptoms arise from the compression or destruction of normal brain tissue. Generalized non-specific symptoms occur as a result of increased intracranial pressure, edema or disruption of the blood-brain barrier. Cognitive impairments also can be attributed to alterations of brain connectivity due to tumor (1). Various studies have reported psychiatric symptoms in 50–90% of brain tumor cases. However, the occurrence of brain tumor patients presenting exclusively with psychiatric symptoms is rare, accounting for approximately 20% of cases (2). The mean duration between the onset of psychiatric symptoms and the diagnosis of a brain tumor was 2.6 years, with a range spanning from 1 week to 27 years. Notably, only 7.9% of patients received a diagnosis within 30 days of the initial presentation of psychiatric symptoms (1,3).

The aim of this case report is to illustrate the diagnostic complexity of PCNSL when presenting predominantly with psychiatric symptoms, in the absence of focal neurological deficits. By documenting this rare and diagnostically challenging presentation, the report seeks to raise clinical awareness and underscore the importance of considering underlying organic etiologies in late-onset or atypical psychiatric conditions. This case contributes to the literature by highlighting the neuropsychiatric dimensions of PCNSL and emphasizing the need for timely neuroimaging in such clinical scenarios.

Case report

A 76-year-old male retired chemical engineer who had worked in a refinery for many years, presented to the emergency department following a suicide attempt involving the ingestion of multiple lithium doses. The patient's serum lithium level at the time was measured at 1.61 mg/dL. Gastric lavage was performed and he was monitored in the internal medicine inpatient unit for three days. Psychiatric examination conducted by the psychiatrist revealed

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depressed mood, anhedonia, impaired attention, suicidal ideation, insomnia, reduced libido, low energy and loss of appetite. Upon stabilization of his general medical condition, he was transferred to the psychiatric inpatient unit due to persistent depressive symptoms.

The patient's initial psychiatric symptoms, such as depressed mood, anhedonia, suicidal ideation, insomnia, decreased energy, reduced libido, loss of appetite and psychomotor retardation first appeared in 2004. He was diagnosed with major depressive disorder. Since then, he has experienced a total of five depressive episodes. He had received sertraline and escitalopram at different dosages over time. Upon further exploration of the patient's psychiatric history, it was revealed that he had experienced hypomanic episodes since his early 30s, occurring 1–2 times per year. These episodes, which typically lasted less than a week, were characterized by increased self-confidence, enhanced sexual interest, reduced need for sleep, increased psychomotor activity and pressured speech. Consequently, his diagnosis was revised to bipolar disorder type II in 2006 and lithium was added to his treatment regimen. He had maintained prolonged remission lasting approximately 11 years with a treatment regimen of lithium (600 mg/day) and venlafaxine (37.5 mg/day). However, his recent depressive symptoms, which began one month ago following the traumatic and sudden death of his son, showed rapid progression. During his hospitalization, forgetfulness, disorientation, negativism, paranoid delusions and visual hallucinations were additionally detected. Bipolar disorder type II depressive episode with psychotic symptoms, grief, post-traumatic stress disorder, dementia and delirium were considered as possible diagnoses. In 2017, he underwent transurethral prostatectomy for benign prostatic hyperplasia. In 2023, he was diagnosed with prostate adenocarcinoma (acinar type, Gleason score: 6/10) and subsequently received radical radiotherapy. Despite the brain magnetic resonance imaging (MRI) performed seven months earlier yielding normal results, the possibility of cancer recurrence and brain metastasis was also included in the preliminary diagnoses.

Hamilton Depression Rating Scale score was 24, The Positive and Negative Syndrome Scale score was 82 and Mini Mental Test score was 21/30 at the first psychiatric examination. No abnormalities were identified in the hemogram, routine biochemistry tests, sedimentation and C-reactive protein levels, serological tests or complete urine analysis. Electrocardiography revealed sinus rhythm and the neurological examination showed no significant findings. A treatment regimen of sertraline 50 mg/day and risperidone 1 mg/day was initiated. During hospitalization, the dose of risperidone was titrated up to 3 mg/day. Brain MRI was performed due to the recent onset of psychotic and neurocognitive symptoms. Contrasted brain MRI showed an intraaxial mass lesion measuring 43x33x43 mm in the left anterior temporal region characterized by regular borders and lobulated contours. It appeared iso-hypointense on T1-weighted imaging (WI), iso-hyperintense on T2WI and marked diffusion restriction with homogeneous enhancement on post-contrast series. There was no hemorrhage signal on susceptibility weighted imaging (SWI) sequence. The findings suggested a differential diagnosis favoring lymphoma or a high-grade glial tumor as the primary consideration. Extensive vasogenic edema was observed in the left temporoparietal region around this lesion. The mass effect resulted in compression of the temporal and occipital horns of the left lateral ventricle and a 4 mm subfalcine shift from the midline to the right was observed (Figure 1 a-e). He was referred to

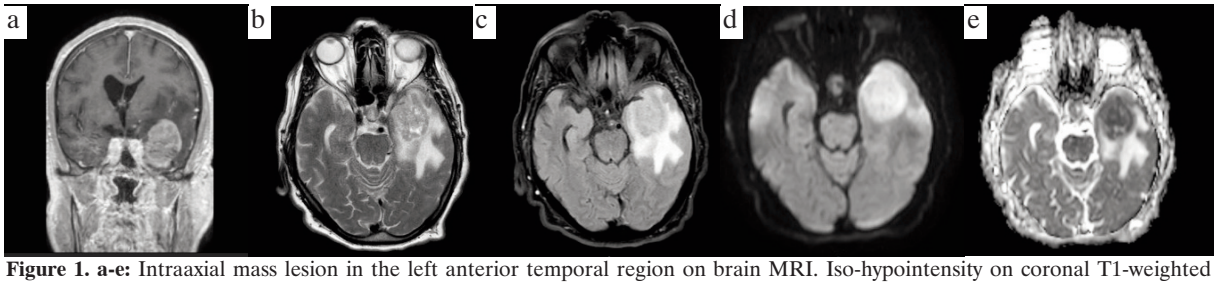

Figure 1. a-e: Intraaxial mass lesion in the left anterior temporal region on brain MRI. Iso-hypointensity on coronal T1-weighted images and subfalcian shift (a). Iso-hyperintensity on axial T2-weighted images (b). Extensive vasogenic edema in the left temporoparietal region on fluid-attenuated inversion recovery (FLAIR) images (c). Hyperintensity on transversal relaxation attenuated by controlled excitation (TRACE) images in diffusion-weighted images (d). Significant diffusion restriction in the apparent diffusion coefficient (ADC) map on diffusion-weighted images (e).

neurosurgery and oncology. Dexamethasone 16 mg/day intravenously was administered to alleviate peritumoral edema and levetiracetam 1000 mg/day orally was prescribed for seizure prophylaxis. After necessary consultations, he was referred to the neurosurgery department and underwent surgical resection. Histopathological examination confirmed diffuse large B cell lymphoma (DLBCL) and his diagnosis was established as PCNSL.

The patient's follow-up has been ongoing at the outpatient psychiatry clinic after the operation. During this period, while his psychotic symptoms subsided, depressive complaints persisted. Consequently, risperidone was gradually tapered and discontinued. The dose of sertraline was increased to 100 mg/day. Due to the persistence of depressive symptoms, lithium was reinitiated, as it had previously been the most effective treatment for the patient. His current treatment regimen consists of lithium 600 mg/day and sertraline 100 mg/day.

DISCUSSION

PCNSL is identified in about 4-5% of all primitive brain tumors (2) and DLBCL represents the most prevalent subtype, comprising more than 90% of cases (4). The incidence of PCNSL was found to be 0.4 per 100,000, rising to 4.32 per 100,000 in individuals aged 70 to 79. The median age at diagnosis of PCNSL is ≥ 64 (5) and age is an independent risk factor for PCNSL (4). Its frequency is higher in men than in women (3). The most significant risk factor for PCNSL has been identified as immune system alterations (immunosuppressant treatments, autoimmune diseases, acquired immune deficiency syndrome (AIDS)) (6).

PCNSL is typically located in the brain parenchyma (92%) as a solitary lesion (65%). It is three times more common in the supratentorial (most frequently in the frontal lobe) than in the infratentorial region (3). The most common clinical manifestation of PCNSL is focal neurological deficits (70%), followed by neuropsychiatric and behavioural changes (43%) (3,5). The most common psychiatric manifestations in brain tumors are mood symptoms. The relationship between tumor size, localization, peritumoral edema, histopathological features and psychiatric symptoms was investigated in patients with brain tumors. While psychiatric symptoms were observed more frequently in patients with tumor sizes exceeding 4 cm, this difference did not reach statistical significance. Only supratentorial localization, the presence of peritumoral edema and malignant histopathological features demonstrated a statistically significant association with the occurrence of psychiatric symptoms (7). Brain tumors located in the left frontal lobe have been frequently associated with depressive symptoms, while those in the right frontal lobe are linked to mania. Tumors in the temporal lobe are commonly associated with psychotic manifestations (8).

Our patient exhibits potential risk factors for PCNSL, including age, gender and immune system alterations potentially induced by radical radiotherapy administered one year ago. He also worked as a chemical engineer at a refinery for 30 years and exposure to harmful industrial chemicals is one of the non-genetic risk factors for brain tumors (1). Tumor diameter greater than 4 cm, malignant character, peritumoral edema and supratentorial location may have created a predisposition to psychiatric symptoms in our patient. The tumor's location in the temporal region, a key component of the limbic system, can lead to the manifestation of depressive and psychotic symptoms in our patient. Recent studies suggest that peritumoral edema disrupts the connections between limbic structures and the cortex, this disruption may play a more critical role than tumor location and size in the development of psychiatric symptoms (7). The extensive peritumoral edema determined in our patient may have accelerated the psychiatric symptoms. Generally, slow-growing tumors tend to remain neurologically silent. In our case, despite the presence of a fast-growing tumor, no focal neurological symptoms were observed.

The 5-year survival rate for PCNSL is reported to be less than 20-30%, with a median survival of 10 to 20 months (6). Early diagnosis and prompt initiation of treatment are crucial for enhancing both quality of life and survival outcomes. Diagnosis can become more challenging in cases where the anticipatory signs are solely psychiatric symptoms. Therefore, brain imaging is recommended in psychiatric conditions with sudden or late onset, poor

treatment response and atypical features (1,7). An integrated and multidisciplinary approach is essential in the management of brain tumors.

PCNSL presents significant diagnostic challenges, particularly when neuropsychiatric symptoms overshadow neurological manifestations. Clinicians should be aware that PCNSL may initially present with purely psychiatric symptoms. Prompt diagnosis and multidisciplinary management, involving neurology, psychiatry, oncology and neurosurgery, are crucial to improving both survival outcomes and quality of life for PCNSL patients. In cases of late-onset, rapidly progressive or atypical psychiatric presentations, particularly those accompanied by cognitive decline or poor treatment response, early neuroimaging should be considered to rule out underlying organic pathology. Further research is warranted to improve the understanding of neuropsychiatric manifestations in PCNSL.

Informed consent: Written informed consent was obtained from the patient and his wife to publish this manuscript.

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When outpatient care falls short: A case report of complex pediatric obsessive-compulsive disorder treated in a day clinic

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SUMMARY

Pediatric obsessive compulsive disorder (OCD) frequently presents with comorbid psychiatric disorders and may show limited response to first-line interventions such as selective serotonin reuptake inhibitors (SSRI) and cognitive behavioral therapy (CBT). The day treatment model, which provides structured, intensive, and multidisciplinary care, is particularly effective for such complex, treatment-resistant cases. This case report presents a 16-year-old female with severe OCD and comorbid skin picking disorder, trichotillomania, hoarding disorder, and major depressive disorder. She had early-onset symptoms, a history of suicide attempts and severe functional impairment. Due to insufficient clinical improvement in outpatient follow-up, she was subsequently admitted to a day clinic. She received comprehensive treatment, including pharmacotherapy (SSRI, antipsychotics, and N-acetylcysteine), CBT, milieu therapy, group therapy, and family psychoeducation/counseling. Following eight weeks of treatment in the day clinic, significant clinical improvement was observed. This case highlights the effectiveness of day treatment in managing severe pediatric OCD with comorbidities. The intensive, multimodal approach led to symptom reduction, improved functioning, and increased self-esteem. Additionally, N-acetylcysteine, which is not commonly used in pediatric psychiatry, appeared to contribute to improvements in skin picking and hair pulling behaviors in this case. This suggests that N-acetylcysteine is a promising option that warrants further investigation. This case report highlights the important role of day clinics in the management of complex psychiatric disorders in children and adolescents, and underscores the need to expand this model, which is currently available in only one center in Türkiye, nationwide.

Key words: Day clinic, obsessive compulsive disorder, skin picking disorder, trichotillomania, hoarding disorder, n-acetylcysteine.

INTRODUCTION

Obsessive compulsive disorder (OCD) is characterized by persistent, intrusive, and distressing thoughts, images, or urges (obsessions), accompanied by repetitive behaviors or mental acts (compulsions) that are time-consuming and cause significant functional impairment (1). The prevalence of pediatric OCD is estimated to be between 1% and 2%. OCD often follows a chronic course and has a substantial negative impact on children's quality of life (2).

First-line treatment for moderate to severe pediatric OCD typically includes a combination of selective serotonin reuptake inhibitors (SSRI) and cognitive behavioral therapy (CBT). While many children benefit from these treatments, approximately half fail to achieve full clinical remission (3). According to Diagnostic and Statistical Manual of Mental Disorders (DSM-5), skin picking disorder, body dysmorphic disorder, hoarding disorder, and trichotillomania are classified under obsessive compulsive and related disorders (OCRD) (1). These disorders frequently co-occur with one another and with other psychiatric disorders, which can complicate treatment and negatively affect clinical outcomes (2). This case report aims to present the diagnostic and treatment process of an adolescent followed in day clinic, diagnosed with severe OCD and comorbid skin picking disorder, hoarding disorder, trichotillomania and major depressive disorder.

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CASE

The patient is a 16-year-old female in the 10th grade, residing with her nuclear family. The prenatal, perinatal, and postnatal periods were unremarkable. Neuromotor development was reported to be age-appropriate, and the primary caregiver was her mother.

Her initial symptoms emerged during primary school, starting with repetitive skin picking on her hands and feet. At times, the resulting lesions were so extensive that she was unable to walk. She had experienced persistent unhappiness and loss of interest for the past five years. She reported a history of persistent peer bullying throughout her school years. In 8th grade, she attempted suicide by drinking bleach in the presence of her classmates, as reported by the patient as an act intended to punish them. Following this attempt, during the onset of the COVID-19 pandemic, she developed additional symptoms, including fear of contamination, compulsive counting, keeping her eyes closed to avoid perceived contamination, hair pulling, blasphemous intrusive thoughts, and hoarding of food packaging waste under the belief that it would prevent distressing thoughts.

After presenting to the clinic with these complaints, she was diagnosed with OCD, skin picking disorder, hoarding disorder, trichotillomania, and major depressive disorder. Following standard pediatric OCD assessment and treatment guidelines (2,4), fluoxetine, a SSRI, was initiated at 20 mg/day and titrated to 40 mg/day, in accordance with first-line therapy recommendations for moderate to severe OCD. As her obsessions increased in severity, aripiprazole 5 mg/day, an atypical antipsychotic, was added for augmentation, according to guidelines supporting the use of antipsychotics in SSRI-refractory pediatric OCD (2,4). It was later discontinued due to blurred vision adverse effect. Subsequently, risperidone 1 mg/day was initiated for treatment augmentation. After two months without clinical improvement, fluoxetine was discontinued, and sertraline, another SSRI, was initiated at 50 mg/day and titrated to 150 mg/day, in line with guideline recommendations for switching to another SSRI after inadequate response to optimized SSRI therapy (2,4). At that time, she was experiencing severe religious obsessions, including the belief that failing to pray would cause to harm herself or her family. She reported praying aloud for an average of 10 hours per day. Despite ongoing follow-up, she attempted suicide again by trying to jump from a school window after further bullying. Following this, it was decided to admit her to the day clinic for more intensive treatment.

During the initial psychiatric evaluation, the patient appeared her chronological age and was dressed appropriately for her socioeconomic status. She was conscious and fully oriented. Her mood was depressed and anxious, with affect congruent with thought content. Her thoughts were goal-directed, and perception was intact. Her speech content focused predominantly on peer bullying, religious obsessions, and harm-related fears. No current suicidal or homicidal thoughts were reported. Cognitive functions were generally assessed to be within normal limits.

Clinical observations noted low self-esteem, poor insight, limited psychological flexibility, and marked social withdrawal. She demonstrated improved peer interactions. The summary of interventions and clinical observations is presented in Table 1.

At the initiation of the day clinic, sertraline was increased to 200 mg/day and risperidone to 2 mg/day, following pediatric OCD guidelines for insufficient response. N-acetylcysteine (NAC) 600 mg/day was added and gradually increased to 1800 mg/day based on emerging evidence for its efficacy in trichotillomania and skin picking disorder (5-7). By the fourth week of treatment, significant reductions were observed in her hair pulling and skin picking behaviors.

During CBT, she was introduced to the cognitive model of OCD and encouraged to identify and list her specific obsessions and compulsions. She was assigned daily exposure tasks, which were gradually extended over time. She documented her distress levels after each task and gradual decreases were observed. She also engaged in cognitive restructuring exercises, where she challenged maladaptive

Table 1. Summary of interventions, applied strategies, and clinical observations in the 8-week day clinic treatment

Intervention Area	Interventions Applied	Clinical Observations
Pharmacotherapy	- Sertraline (> 200 mg) - Risperidone (> 2 mg) - N-acetylcysteine (> 1800 mg)	- Significant reduction in obsessions and compulsions - Decrease in hair pulling and skin picking behaviors
Cognitive Behavioral Therapy (CBT)	- Psychoeducation on the cognitive model - Listing obsessions and compulsions - Cognitive restructuring or reframing - Activity scheduling and behavioral activation - Behavioral experiments - Relaxation and stress reduction techniques - ERP practices	- Improved emotional regulation - Reduction in anxiety and distress related to obsessions - Resolution of suicidal ideation - Enhanced insight into OCD patterns - Improved cognitive flexibility and reduced rumination - Enhanced coping skills and stress management
Family Education & Counseling	- OCD psychoeducation - Supportive family communication training	- Strengthened family support and communication patterns - Increased parental understanding of OCD - Improvement in family problem-solving and conflict resolution skills - Enhanced emotional support within the household - Greater adherence to treatment recommendations encouraged by family involvement - Reduction in episodes of anger at home
Group & Milieu Therapy	- Group therapy with peers - Social skills development - Group ERP sessions	- Increased empathy and improved social skills - Increased social interaction and participation - Positive response to group ERP sessions - Increased motivation and morale through peer support
Overall Clinical Course	- 8-week day clinic follow-up - Structured daily monitoring	- Noticeable clinical and functional improvement. - Enhanced daily functioning and academic motivation - Improved quality of life - Notable reduction in standardized scale scores*: -CGI: 6 >> 3 -CGAS: 35 >> 70 -Y-BOCS: 38 >> 22 -BDI: 46 >> 10 -STAI: 75/60 >> 47/47 -RSES: 10 >> 24

*Note: Clinically significant improvement is defined as Y-BOCS ≥35% reduction (observed: 42%), CGI ≤ 3 (6>> 3, moving from severely ill to mildly ill), and CGAS >60 (35>>70, improvement from serious to mild functional impairment). Reductions in BDI (0-9: minimal, 10-16: mild, 17-29: moderate, 30-63: severe), STAI (40-59: moderate, ≥ 60: high) and increase in RSES (≤ 15: low self-esteem, 16-25: normal self-esteem, 26-30:high self-esteem) indicate meaningful symptom and functional improvement based on standard thresholds for children and adolescents (20).
BDI: Beck Depression Inventory, CGAS: Children's Global Assessment Scale, CGI: Clinical Global Impression, ERP: Exposure and response prevention, OCD: Obsessive compulsive disorder, RSES: Rosenberg Self-Esteem Scale, STAI: State-Trait Anxiety Inventory, Y-BOCS: Yale-Brown Obsessive Compulsive Scale.

core beliefs. Initially, she expressed severe anxiety at the idea of reducing rituals. Through gradual exposure and response prevention, she began tolerating longer periods without compulsions, reflecting improvements in clinical functioning. Cognitive restructuring was crucial in addressing her catastrophic beliefs. She began challenging her core assumptions about harm and responsibility, gradually recognizing the irrational nature of these thoughts. Over time, improvements were noted in her psychological flexibility and emotional regulation.

Family psychoeducation focused on the mechanisms of OCD, avoiding reassurance, and fostering supportive communication. The patient's mother initially struggled with feelings of guilt and the urge to accommodate rituals, fearing that resistance would exacerbate her daughter's distress. Over time, the family gradually learned to maintain firm but supportive boundaries, which contributed significantly to the patient's progress. Group therapy sessions helped her improve social skills and reduced feelings of isolation. She engaged in group exposure and response prevention tasks, which fostered empathy and peer support, enhancing her motivation and morale.

Throughout the day clinic program, the patient demonstrated a high levels of engagement and adherence to both pharmacological and psychotherapeutic interventions. Despite occasional moments of discouragement, her motivation was sustained by the support of the staff and interactions with peer group. Overall, her cooperation and positive attitude were crucial factors in the treatment's success. At discharge, she showed marked improvements across all standardized measures and global clinical ratings (Table 1). She and her family consented to continue weekly outpatient

CBT sessions focused on relapse prevention and strengthening her functional skills, with a planned gradual return to school under close support. In addition, a comprehensive crisis intervention plan was also developed to mitigate future risks. Written and verbal informed consent was obtained from the patient and parent to publish this report.

DISCUSSION

This case illustrates a complex presentation of OCD accompanied by depression and multiple comorbid OCRDs, including skin picking disorder, trichotillomania, and hoarding disorder. Psychiatric comorbidity is considered the rule rather than the exception in pediatric OCD and is associated with significantly lower treatment response and remission rates (8,9). Consistent with these findings, our patient exhibited poor initial response to treatment and required a multimodal, intensive approach to achieve a significant reduction in symptoms. These observations highlight the critical importance of assessing and addressing comorbidities in the management of pediatric OCD, particularly in severe and treatment-resistant cases.

The patient exhibited a broad range of OCD symptom dimensions, including fear of contaminations, religious and harm-related obsessions, compulsive praying, and hoarding. Religious and aggressive obsessions, in particular, have been associated with poorer insight, greater functional impairment, and a less favorable prognosis compared to washing and checking compulsions (2). These factors likely contributed to the severity and persistence of symptoms in this case.

Early-onset OCD is often associated with a more severe clinical presentation, higher rates of psychiatric comorbidity, and increased functional impairment (2). In the presented case, the patient began exhibiting compulsive behaviors during primary school, which aligns with the literature suggesting an average onset of pediatric OCD between 7.5 and 12.5 years, with diagnosis typically delayed until adolescence (10). This diagnostic delay, also present in our case, is clinically significant, as early intervention is crucial in preventing symptom entrenchment and psychosocial deterioration. The role of family accommodation and environmental stressors, such as peer bullying in this case, should not be overlooked. Negative social interactions and lack of peer support may exacerbate symptoms or reduce treatment efficacy (11,12).

Insight in OCD is a critical determinant of treatment outcome. Poor insight, defined as limited recognition of the irrational nature of obsessions and compulsions has been associated with increased severity, reduced treatment adherence, and poorer outcomes (13). In the present case, the patient demonstrated impaired insight, particularly in relation to her religious obsessions, which likely contributed to her fluctuating response to treatment. Unfortunately, the literature on insight in children and adolescents with OCD remains scarce. More research is needed to explore the developmental aspects of insight and its role in tailoring interventions.

Pharmacological treatment was initiated with fluoxetine, a SSRI prescribed for pediatric OCD. However, due to lack of clinical response, fluoxetine was switched to sertraline. This strategy aligns with current treatment guidelines, which recommend SSRI as the first-line pharmacologic treatment, and combined CBT with SSRI for moderate to severe cases (2). Approximately 40% of patients do not respond adequately to SSRI monotherapy (14). Adjunctive agents, including the use of atypical antipsychotics or glutamate modulators, are increasingly being explored. Although NAC is not yet widely used in pediatric psychiatry clinics, emerging evidence suggests its potential benefit as an adjunctive treatment in managing symptoms such as skin picking and trichotillomania (5-7). In this case, the addition of NAC, a glutamate modulator, appeared to contribute to symptom improvement. However, further controlled studies are needed to establish its efficacy and safety in pediatric populations. The use of NAC in this context highlights the importance of exploring novel therapeutic options for complex, treatment-resistant pediatric OCD.

The complexity and severity of the patient's condition, including multiple suicide attempts, signifi-

cant academic/social impairment and comorbidities contributed to treatment resistance and necessitated an intensive, multimodal intervention in a day treatment clinic. The day treatment model is designed to provide care in the least restrictive environment and tailored to the child's individual needs. This approach allows children and adolescents to receive structured and intensive therapeutic interventions without being removed from their family environment (15). Day clinic programs typically integrate group therapy, milieu therapy, CBT, and pharmacological treatments. Recent studies in psychiatric populations have demonstrated the effectiveness of day treatment in improving clinical outcomes, social functioning, and overall quality of life (16-18). Day treatment offers a structured environment where intensive behavioral interventions, particularly exposure and response prevention, can be effectively applied. Psychoeducation and family involvement were key components of the therapeutic process, emphasizing the need to avoid reinforcing compulsive behaviors and to foster supportive, nonjudgmental communication at home. In this case, following initial treatment resistance, the patient exhibited substantial clinical improvement through a comprehensive, multimodal intervention in day treatment, incorporating CBT, pharmacological optimization, and family psychoeducation. Comprehensive treatment opportunities offered by day clinics represent a valuable alternative to inpatient care for children and adolescents with severe psychiatric disorders. However, in Turkey, day clinics and inpatient units for this population are markedly limited, resulting in predominantly outpatient-based care even for complex cases (19). At present, only one center currently offers a day treatment program for youth. Expanding such services is essential to improve access to intensive, multidisciplinary care and enhance clinical outcomes for children and adolescents with severe mental health needs.

In conclusion, this case highlights the importance of individualized, multimodal treatment approaches—including day treatment—in the management of pediatric OCD, particularly in patients with poor insight and multiple comorbidities. It also underscores the need for novel therapeutic strategies, such as NAC, and for further research on insight and treatment resistance in youth with OCD.

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Drug-induced parkinsonism in an adolescent with first manic episode: Neuropsychiatric manifestations and diagnostic challenges

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SUMMARY

The rising number of child and adolescent psychiatry referrals, along with the growing use of medications for mental health problems, has led to an increased incidence of drug-induced parkinsonism (DIP). This report aims to document a patient with DIP, which is rarely seen in child and adolescent psychiatry clinical practice, and to present the successful treatment of this patient with amantadine. Amantadine represents an evidence-based pharmacologic option for treating drug-induced parkinsonism.

Key words: Drug-induced parkinsonism, bipolar disorder, amantadine

INTRODUCTION

Recent evidence indicates a substantial increase in the use of both antipsychotic and antidepressant medications among children and adolescents, reflecting trends toward more frequent initiation and longer-term treatment (1, 2). This growing use of psychotropic medications, particularly antipsychotics, has been accompanied by a noticeable increase in the incidence of drug-induced parkinsonism (DIP) (3). Despite its clinical significance, DIP remains under-recognized in youth, highlighting the need for heightened vigilance in monitoring extrapyramidal side effects in this vulnerable group (3). To better understand the clinical implications of DIP, it is essential to first define its core features and distinguish it from other movement disorders.

Parkinsonism is a clinical syndrome characterized by bradykinesia, rigidity, resting tremor, and postural instability (4). It is broadly classified into degenerative and secondary forms based on etiology (4). Among children, DIP represents the most common cause of secondary parkinsonism and is typically associated with antipsychotic use, though other medications such as calcium channel blockers, antiemetics, and valproic acid may also be implicated (5). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), DIP is defined by the emergence of resting tremor, muscular rigidity, akinesia, or bradykinesia within weeks of initiating or increasing the dosage of a causative medication (6). In the clinical assessment of DIP, it is essential to differentiate it from other antipsychotic-related movement disorders such as tardive dyskinesia, acute dystonic reactions, akathisia, and neuroleptic malignant syndrome (NMS) (7). Early recognition and appropriate management rely on a high index of suspicion and comprehensive knowledge of the diverse range of medications capable of inducing parkinsonism.

Most studies on DIP have focused on adult populations, resulting in a limited understanding of its prevalence, risk factors, and management in children and adolescents (3). The distinct clinical characteristics and psychotropic medication use pat-

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terns in pediatric patients reduce the applicability of adult-based findings. Recent data by Jeon et al. (2023) addressed this knowledge gap, reporting that the annual prevalence of DIP in children and adolescents increased approximately tenfold between 2010 and 2017 (3). This rise was largely driven by increased prescriptions of atypical antipsychotics, particularly risperidone and aripiprazole (3). These findings underscore the need for age-specific research, cautious prescribing practices, and vigilant monitoring for DIP in young patients (8).

This report aims to present a rare case of DIP in an adolescent experiencing her first manic episode, highlighting the diagnostic challenges and therapeutic considerations associated with this condition. By documenting the successful management of DIP with amantadine and detailing the clinical decision-making process, this case underscores the importance of early recognition and tailored intervention in pediatric neuropsychiatric practice.

CASE

Initial Psychiatric Presentation and Treatment

A 15-year-old female patient was referred to our hospital's pediatric emergency department with symptoms of aggression, insomnia, and increased activity over the past few days. She had no prior psychiatric or medical history, but her family history was notable for schizophrenia in her older brother. There was no history of substance or alcohol use. Approximately one week before symptom onset, she received a 3-day course of azithromycin for an upper respiratory infection. Following this, she presented to an emergency service with insomnia, agitation, aggression, and pressured speech. She was diagnosed with a bipolar manic episode with psychotic features and was administered two injections of haloperidol (5 mg) and biperiden (5 mg), along with oral olanzapine 5 mg twice daily. Due to the persistence of psychiatric symptoms and concerns about possible organic causes, she was referred to our hospital for further evaluation.

Onset of Extrapyramidal Symptoms

Upon admission, she was uncooperative, disoriented, and exhibited elevated mood, religious delusions, rapid speech, and psychomotor agitation. Haloperidol 5 mg/day IM, biperiden 5 mg/day IM, and olanzapine 5 mg twice daily were continued. Extensive investigations, including autoimmune and rheumatological panels (e.g., anti-NMDA, ANA, anti-dsDNA, ANCA), cerebrospinal fluid analysis, EEG, and cranial imaging were performed, all yielding normal results.

Despite treatment, her agitation worsened. Zuclopenthixol acuphase (50 mg IM) and zuclopenthixol decanoate depot (200 mg) were administered alongside biperiden (2 mg twice daily). During hospitalization, she developed extrapyramidal symptoms including akathisia, echolalia, negativism, severe bradykinesia, sialorrhea, and postural instability. Due to the progression of dystonia affecting her jaw, which led to difficulties in speech and swallowing, a nasogastric tube was inserted for nutritional support. In addition, midazolam infusion (0.2 mg/kg/h) was initiated to manage severe dystonic reactions and provide sedation. Her bradykinesia was profound and she exhibited marked facial hypomimia. Muscle rigidity was significant, and she demonstrated considerable difficulty with voluntary movements, including ambulation and oromotor control. Treatment was switched to lorazepam 2.5 mg twice daily and biperiden 2 mg daily due to suspected catatonia.

Diagnostic Evaluation and Differential Diagnosis

The patient’s complex clinical picture necessitated consideration of several differential diagnoses, including catatonia, NMS, and autoimmune encephalitis.

The patient began to exhibit disorganized behavior and insomnia, accompanied by bradykinesia, bradymimia, muscular rigidity, distal tremors, postural instability, and an inability to ambulate without assistance. As there was no observable clinical improvement with lorazepam treatment, it was discontinued, and the patient was subsequently trans-

ferred to the pediatric neurology ward. Given the lack of response to lorazepam and the absence of hallmark catatonic features such as catalepsy and waxy flexibility, catatonia was considered unlikely. Due to the emergence of dysphagia secondary to jaw dystonia, nasogastric feeding was initiated. Neurological examination revealed marked rigidity, cogwheel phenomenon, and tremors in the upper extremities, along with difficulty in voluntary eye opening and oromandibular movement. Given the deterioration in speech and swallowing functions attributable to dystonia, a continuous infusion of midazolam was commenced at a dose of 0.2 mg/kg/hr, and biperiden was added to the treatment regimen at a dosage of 2.5 mg three times daily.

The patient, sedated with a continuous midazolam infusion, continued to exhibit disorganized behavior throughout hospitalization. She responded to questions with inappropriate, single-word utterances, frequently incorporating offensive language, and her speech was characterized by echolalia. Although muscle strength was reduced, she was able to stand with support. Follow-up laboratory tests revealed elevated creatine kinase (CK) levels—707 U/L, 964 U/L, and 784 U/L, respectively—peaking at 964 U/L before beginning to decline. Due to concerns regarding malignant hyperthermia, bromocriptine was initiated at a dose of 2.5 mg twice daily. However, as clinical improvement was not observed, bromocriptine was discontinued. Since no significant benefit was achieved with midazolam either, it was subsequently stopped. Oral clonazepam drops (2.5 mg/mL, 5 drops three times daily) and propranolol 40 mg twice daily were then initiated to manage the patient's dystonia and tremor. During continued follow-up, CK levels declined to 404 U/L and subsequently returned to within normal limits. The normalization of CK levels, stable body temperature (36.5–37.0°C), and normal arterial blood gas results were reassuring. Moreover, there were no clinical or laboratory findings typically associated with malignant hyperthermia, such as tachypnea, hypercapnia, acid-base imbalance, rhabdomyolysis, myoglobinuria, renal dysfunction, hyperkalemia, or cardiac arrhythmias. Therefore, the likelihood of malignant hyperthermia was considered low.

Autoimmune encephalitis was also evaluated because of the acute onset of psychiatric symptoms. Nevertheless, negative cerebrospinal fluid autoimmune panels and imaging results excluded this possibility.

Final Diagnosis

As part of the follow-up evaluation, the patient continued to exhibit severe rigidity, bradykinesia, and resting tremor. Based on the clinical presentation, a preliminary diagnosis of DIP was considered, and treatment with amantadine was initiated at a dose of 25 mg twice daily. In addition, the patient continued to receive clonazepam oral drops (2.5 mg/mL; 5 drops three times daily) and propranolol 40 mg twice daily as part of her ongoing treatment regimen. Over time, the amantadine dose was gradually titrated to 100 mg/day, resulting in a significant reduction in rigidity and tremor, with noticeable improvement occurring within approximately five days of treatment initiation. As clinical improvement progressed, nasogastric feeding was discontinued and oral intake was re-established. Upon further psychiatric evaluation, the patient, who was found to be in partial remission from manic symptoms, was started on lithium at a dose of 300 mg once daily. Both extrapyramidal and affective symptoms showed gradual improvement.

Parkinsonian symptoms emerged shortly after the initiation of antipsychotic treatment for a manic episode. Additionally, there was no personal or family history suggestive of idiopathic Parkinson's disease. These findings further supported the diagnosis of DIP. By the fourth week of hospitalization, her neurological symptoms had resolved, and she was deemed clinically stable for discharge.

Treatment and Outcome

At the time of discharge, the patient's mental status examination revealed orientation to person, place, and time. Attention was impaired, and she exhibited minimal psychomotor agitation along with mild rigidity, consistent with residual extrapyramidal side effects. Her mood was slightly elevated with mood-congruent affect, and both insight and judgment were moderately impaired. She was dis-

Table 1. Timeline of Case Report

Step (with Day)	Description
Initial Presentation and Diagnosis (Day 1)	Acute onset of mania with psychotic features; treated with haloperidol and olanzapine.
Referral to Tertiary Hospital (Day 3)	Transferred due to persistent agitation and suspected organic etiology.
Inpatient Evaluation (Day 5)	Continued psychotic symptoms; extensive workup (EEG, MRI, CSF, autoimmune panel) was normal.
Onset of Extrapyramidal Symptoms (Day 7)	Developed dystonia, bradykinesia, sialorrhea, and swallowing difficulties; midazolam infusion and NG tube initiated.
Differential Diagnosis	Catatonia, NMS, and autoimmune encephalitis considered but ruled out; lorazepam and bromocriptine were ineffective.
Diagnosis of Drug-Induced Parkinsonism (Day 21-)	Amantadine started; clonazepam and propranolol added; marked motor improvement followed.
Discharge and Early Follow-Up (Week 4)	Discharged with mild residual symptoms; maintained on lithium and antiparkinsonian medications.
Long-Term Outcome (Month 2–12)	Full resolution of parkinsonian symptoms by week 6; one-year remission with good functional recovery.

EEG: Electroencephalography; MRI: Magnetic Resonance Imaging; CSF: Cerebrospinal Fluid; NMS: Neuroleptic Malignant Syndrome

charged on a treatment regimen consisting of lithium 300 mg once daily, amantadine 50 mg twice daily, clonazepam oral drops (2.5 mg/mL) three times daily, and propranolol 40 mg twice daily. She was subsequently followed at regular intervals in the outpatient clinic.

At the one-month follow-up, her mobility had returned to normal, and parkinsonian symptoms had completely resolved. Subsequently, amantadine and propranolol were gradually tapered and discontinued by the sixth week of treatment. Clonazepam was also discontinued, and the lithium dose was adjusted to 300 mg twice daily. During the follow-up period, melatonin 3 mg was temporarily added to address sleep difficulties. The patient has continued outpatient treatment with lithium 300 mg twice daily for the maintenance of bipolar disorder. At the one-year follow-up, she remained in remission with favorable social and academic functioning (Table 1).

DISCUSSION

This case report describes a rare presentation of DIP in an adolescent during treatment for a first manic episode of bipolar disorder. DIP risk is influenced by factors such as drug type, dosage, patient age, and sex, with a higher susceptibility reported in females (9). To the best of our knowledge, this is the first reported case of DIP in the pediatric population in our country. In our case, parkinsonian symptoms developed gradually after the initiation of antipsychotic medication and became prominent within approximately one week. Given the subacute progression, the differential diagnosis included primary movement disorders, encephalitis/encephalopathy, catatonia, and NMS.

In a clinical study involving 97 patients, DIP was reported as the most frequently observed movement disorder associated with dopamine receptor-blocking agents (10). This finding underscores the need for early recognition, as DIP not only represents a common complication of antipsychotic therapy but can also mimic or coexist with other serious neurological conditions, potentially delaying appropriate management. Movement disorders associated with the use of antipsychotic medications include tardive dyskinesia, acute dystonic reactions, akathisia and DIP (7). Unlike tardive dyskinesia, DIP occurs earlier in the course of antipsychotic treatment, with approximately 50–75% of cases appearing within the first month and 90% within the first three months (7). Akathisia may occur either with or without DIP. Reducing the antipsychotic dose can improve both conditions, but anticholinergics are ineffective in treating akathisia (11). In our case, beta-blockers were used to address the akathisia accompanying DIP, and a beneficial response was observed. When rigidity and altered consciousness occur after antipsychotic drug use, NMS must also be considered. According to recent expert guidance, NMS is characterized by hyperthermia, altered mental status, muscle rigidity, and autonomic instability, supported by laboratory findings such as leukocytosis and elevated creatine kinase (12). In our patient, severe bradykinesia and bradyphrenia were accompanied by rigidity but without fever or autonomic dysfunction, and laboratory evaluation revealed no leukocytosis or metabolic acidosis. These findings argued strongly against NMS. Similarly, catatonia was considered

because of the patient's psychomotor slowing and rigidity; however, the absence of catalepsy or waxy flexibility—core features in DSM-5 diagnostic criteria—made catatonia unlikely (6). The lack of response to benzodiazepines at standard therapeutic doses further reduced the likelihood of this diagnosis (13). Encephalitis and encephalopathy were also evaluated. The absence of abnormal findings in brain MRI, cerebrospinal fluid analysis, and autoimmune panels effectively excluded these possibilities (14).

Due to the patient's increased rigidity, bradykinesia, and a marked degree of bradymimia, a diagnosis of DIP was considered, and treatment with amantadine was initiated. Although amantadine is Food and Drug Administration (FDA) approved for adults with DIP, its pediatric use is off-label (15). Nevertheless, pharmacological evidence supports its dopaminergic action—particularly through indirect dopamine release and receptor stimulation (16), and limited pediatric data suggest acceptable tolerability and functional improvement in neurologic conditions (17). Following treatment, our patient experienced rapid improvement, particularly in motor function, which allowed for the introduction of lithium amid partial remission of affective symptoms. In mild to moderate cases of DIP, discontinuation of the causative drug alone is often sufficient to achieve symptom resolution; however, in this case, the severity of parkinsonian features warranted initiating amantadine as adjunctive therapy (18). The rapid response observed may have been facilitated by the absence of comorbid medical conditions and a negative family history of Parkinson's disease—factors that could be favorable for recovery—though this remains speculative given the paucity of pediatric data. A similar outcome was reported in a previous pediatric case, where amantadine treatment led to marked clinical improvement within 72 hours (19).

In managing DIP, the causative drug should be discontinued whenever possible, with subsequent clinical monitoring (18). If discontinuation is not feasible, dose reduction and, if needed, substitution with an alternative agent is recommended (18). Additional pharmacologic options include a levodopa–benserazide combination, anticholinergic agents, and amantadine in appropriate candidates (18,20,21). Symptom resolution generally occurs within weeks to months after discontinuation of the causative drug, but the course can vary from days to years, and symptoms may persist or progress in up to 50% of patients, with approximately 10% experiencing permanent deficits (5). As in our patient, cases with symptom resolution are classified as "pure DIP," whereas those without symptom improvement are referred to as "toxic DIP" (22). Persistence or recurrence of parkinsonian symptoms—whether through gradual progression or reappearance after a complete remission—may point to an underlying, previously unrecognized idiopathic Parkinson's disease or another neurodegenerative parkinsonian syndrome triggered by drug exposure (22). Conversely, non-progressive persistent symptoms may indicate irreversible injury to the nigrostriatal dopaminergic pathway due to toxic pharmacologic effects, as was the case in our patient (22).

In conclusion, this case highlights the importance of considering DIP in adolescents with acute or subacute movement disorders during antipsychotic treatment. The rapid clinical improvement observed suggests that early recognition and timely intervention can reduce unnecessary investigations and prevent functional impairment. While amantadine has a long-standing role in Parkinson's disease, robust evidence for its use in DIP—particularly in pediatric cases—remains scarce, warranting cautious patient selection and close monitoring (16). Based on this case, clinicians should be cautious when initiating high-dose antipsychotics in first-time users and, whenever feasible, consider starting with oral regimens unless rapid symptom control necessitates parenteral administration.

The findings should be interpreted in light of key limitations, including the inherent constraints of a single case report, the inability to establish causality, the absence of standardized long-term follow-up, the lack of objective severity assessment using validated parkinsonism rating scales, and the omission of neuroimaging—which some studies recommend as part of the diagnostic work-up (22). Future research could include the use of structured movement disorder rating scales to systematically screen patients receiving antipsychotics—particularly those on long-term treatment—for early

detection of extrapyramidal symptoms.

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Neuroleptic malignant syndrome induced by extended-release injectable aripiprazole: A case report

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SUMMARY

Neuroleptic malignant syndrome is a rare but potentially fatal condition associated with the use of medications that affect the central dopaminergic system. It is characterized by symptoms such as hyperthermia, musclular rigidity, confusion, and autonomic instability. This case report presents a female patient diagnosed with schizophrenia who was initially treated with zuclopenthixol depot but could not tolerate its side effects. Therefore, her treatment was switched to long-acting injectable aripiprazole. Fifteen days after the administration of long-acting injectable aripiprazole, she presented to the emergency department with classic symptoms of neuroleptic malignant syndrome including fever, musclular rigidity, altered consciousness, hypertension, and hypersalivation. The clinical course of the case is described, and the findings are discussed in light of the existing literature.

Key words: Neuroleptic malignant syndrome, Aripiprazole, Extended-release injection, Antipsychotic drugs

INTRODUCTION

Neuroleptic malignant syndrome (NMS) is a rare but life-threatening condition, typically associated with the use of medications that affect central dopaminergic neurotransmission (1). The majority of NMS cases are linked to antipsychotic drugs; however, it has also been reported in association with other medications such as lithium, antidepressants, and metoclopramide (2). According to various reports, NMS develops in approximately 0.02% to 3% of patients exposed to an antipsychotic agent (3).

The risk of NMS has been reported to be higher with typical antipsychotic drugs, particularly those with high potency. Atypical antipsychotics are considered less likely to induce NMS due to their relatively lower dopamine D2 receptor blockade. This also applies to aripiprazole, which is a partial D2 agonist and thus does not exert full blockade effects (4). However, it has been noted that more case data are needed to accurately determine the true incidence of NMS associated with atypical antipsychotics (5). There are very few reported cases in the literature concerning NMS associated with the long-acting injectable (LAI) form of aripiprazole (6,7). As publications related to NMS cases associated with long-acting atypical antipsychotics increase, the resulting data will contribute to a more accurate clinical approach for this patient population. This report aims to contribute to the literature by presenting a case of NMS associated with the use of the long-acting form of the atypical antipsychotic aripiprazole.

CASE

A 62-year-old female patient was reported to have been under follow-up with a diagnosis of schizophrenia. She presented to the emergency department of our hospital with symptoms including fever, altered mental status, tremors, hypersalivation, and palpitations. On physical examination, she was unresponsive to verbal stimuli, exhibited rigidity particularly in the upper extremities, and showed coarse tremors in the distal parts of the extremities. Her body temperature was recorded at

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39.6 °C, blood pressure at 145/95 mm Hg, and heart rate at 145 bpm. Laboratory investigations revealed a leukocyte count of 11,490/mm³ (reference range: 4,000–10,000), neutrophil count of 9,640/mm³ (re-ference range: 2,000–8,000), CK level of 3,120 U/L (reference range: 0–175), aspartate aminotransferase (AST) level of 81 U/L (reference range: 13–40), and alanine aminotransferase (ALT) level of 45 U/L (reference range: 10–45). Although the patient had no prior history of renal failure, her blood urea nitrogen was 64 mg/dL (reference range: 20–50) and creatinine was 1.4 mg/dL (refe-rence range: 0.5–1.1). Cranial computed tomography (CT) revealed no signal changes in the cerebral or cerebellar parenchyma that would suggest acute or subacute ischemia or infarction. Thoracic CT showed a consolidated area in the right lung associated with minimal inflammation.

The patient had a history of schizophrenia for approximately 20 years, with four prior hospitalizations, the most recent of which occurred about five years ago due to non-adherence to treatment. She had previously used oral forms of antipsychotics such as aripiprazole, paliperidone, olanzapine, and haloperidol. For the past year, she had been receiving intramuscular zuclopenthixol decanoate at a dose of 200 mg every two weeks. It was reported that her medication had been changed approximately 15 days earlier due to side effects such as emotional blunting, apathy, and rigidity in the extremities, and that she had been administered 400 mg of long-acting injectable aripiprazole. It was reported that the oral form of aripiprazole was not reintroduced, as the patient had previously used and tolerated it. It was reported that for approximately two days prior to admission, she had experienced loss of appetite, difficulty walking, and somnolence. With the onset of fever and altered consciousness, she presented to the emergency department. In the emergency department, she was evaluated by psychiatry, neurology, and anesthesiology and reanimation specialists. A diagnosis of NMS induced by aripiprazole LAI was primarily considered. It was decided to monitor the patient in the intensive care unit (ICU).

The patient was followed in the ICU for 7 days, during which she received supportive care including bromocriptine at a dose of 10 mg/day. Her symptoms gradually subsided. She was subsequently transferred to the neurology ward, where she was monitored for an additional 5 days. Her level of consciousness returned, and although limb rigidity had improved, it persisted to some extent. Laboratory parameters gradually approached normal ranges (Table 1). CSF analysis did not reveal any findings suggestive of infection or systemic disease.

Table 1. Changes in the patient□s laboratory parameters

	Reference range	Emergency department	Intensive care day 3	Intensive care day 7
White blood cell count (mm³)	4000-10000	11490	6140	7500
Neutrophile count (mm³	2000-8000	9640	4950	5200
Creatinine kinase (U/L)	0-175	3120	788	153
Aspartate aminotransferase (IU/L)	13-40	81	46	40
Alanine aminotransferase (IU/L)	10-45	45	45	43
Urea (mg/dl	20-50	64	43	36
Creatinine (mg/dl)	0.5-1.1	1.4	0.4	0.5

At a follow-up visit approximately one month after discharge, the patient's rigidity had resolved, and her general condition was stable. Paliperidone was initiated at 3 mg/day, as she had previously used it without adverse effects. The dose was increased to 6 mg/day after 15 days. Her positive psychotic symptoms were under control, and apathy and emotional blunting had partially improved. Her CK level, measured one month after discharge, was 151 U/L. The patient has been maintained on paliperidone monotherapy at 6 mg/day for approximately one year and remains in remission.

DISCUSSION

In this case report, we present a case of NMS that developed following a switch from zuclopenthixol, a typical depot antipsychotic, to aripiprazole LAI. Regardless of the dose and route of administration, every antipsychotic drug has the potential to induce NMS. However, it has been suggested that the type of antipsychotic used, along with certain individual or environmental risk factors, may predispose individuals to the development of NMS. Factors such as high-dose antipsychotic use, rapid dose escalation, intravenous administration, and polypharma-

cy have been reported to increase the risk of NMS (8).

In this case, the initiation of long-acting aripiprazole only 15 days after discontinuation of depot zuclopenthixol may have resulted in a clinically relevant pharmacodynamic interaction. Given the long elimination half-life of zuclopenthixol (approximately 19 days), plasma concentrations may still have been present at meaningful levels, thereby modifying the impact of aripiprazole's partial agonist properties (9). The prior exposure to depot zuclopenthixol, a potent D2 receptor antagonist, could have led to receptor supersensitivity. Under such conditions, the partial agonist activity of aripiprazole may provide insufficient dopaminergic stimulation, paradoxically resulting in impaired dopaminergic signaling. Owing to its submaximal intrinsic activity, aripiprazole may be unable to adequately activate hypersensitive receptors and, in this context, may functionally act as a dopamine antagonist. This interpretation aligns with the dopaminergic hypofunction hypothesis in the pathogenesis of NMS (10). Accordingly, this case underscores the importance of carefully planning antipsychotic switching strategies, taking into account drug half-lives and pharmacodynamic properties.

Long-acting injectable antipsychotics (LAI-APs) are a valuable option for maintenance treatment of schizophrenia due to their effectiveness in preventing relapse (11). Nevertheless, LAI-APs remain underutilized in many countries due to various concerns, including pain, needle phobia, and cost (12). Additionally, there are concerns that LAI-APs may be associated with serious adverse effects such as NMS, tardive dyskinesia, and cardiovascular events, and may lead to longer-lasting symptoms compared to oral antipsychotics (OAPs) (11,13). This may be attributed to the relatively higher doses used in LAI-APs and their slower elimination from the body compared to OAPs.

Whether LAI-APs are associated with a higher risk of NMS compared to OAPs remains a matter of debate. A case-control study utilizing healthcare records identified LAIs as a potential risk factor for NMS (14). Another case-control study using electronic health record data found that the risk varied depending on the type of LAI used (15). Studies based on adverse event reporting databases have suggested that LAI use does not increase the risk of NMS (16,17). In Japan, a study using data from a spontaneous adverse event reporting database reported fewer cases of NMS among patients using LAI aripiprazole and LAI paliperidone compared to those using their oral equivalents (11). The risk of NMS associated specifically with LAI-SGAs remains unclear, as there are very few reports exploring the association between NMS and these newer agents compared to LAI first-generation antipsychotics (LAI-FGAs). Therefore, additional case reports and systematic reviews are needed to better understand the relationship between LAI-SGAs and NMS.

NMS has been reported to occur relatively early in the course of both LAI and oral SGA antipsychotic treatment (11). In a study from Japan using data from a spontaneous adverse event reporting system, NMS symptoms were found to emerge approximately three weeks after the administration of LAI aripiprazole (11). In previous case reports of aripiprazole LAI-induced NMS, symptoms were reported to develop on day 30 in one case and on day 40 in another (18,19). In a case characterized by malignant CK elevation and subclinical NMS symptoms, onset occurred three days following LAI aripiprazole administration (6). In our case, symptoms began on day 15, which partially overlaps with the timeframes reported in previous case studies.

Since NMS tends to occur during the relatively early phases of antipsychotic treatment, tolerability assessment becomes particularly important to prevent NMS associated with LAI antipsychotics. In our case, it was learned that oral aripiprazole was not reinitiated because the patient had previously tolerated it. However, it remains unclear how long the patient had taken oral aripiprazole and whether it was used consistently. When treatment with LAI-SGAs is planned, tolerability should be assessed with oral SGAs for more than one month, and careful monitoring for the emergence of NMS, especially during the early phase of LAI-AP administration is recommended (11).

The biological basis of NMS remains unknown. Antipsychotic drugs exert their effects through dopamine D2 receptor blockade, and this blockade has been proposed to play a role in the pathophysiology of the syndrome (3). Furthermore, the potential cytotoxicity and genotoxicity of aripiprazole have been studied in MKN45 and NIH3T3 cells, which are related to cancer cell lines. Aripiprazole was identified as a potentially potent cytotoxic agent (20). Therefore, it is not surprising that aripiprazole may lead to elevated CK levels due to cellular breakdown (6). These findings appear to have some relevance to the pathogenesis of neuroleptic malignant syndrome, although they have not yet been thoroughly investigated.

Advanced age, comorbid medical conditions, psychological or physical stress, prolonged exposure to high temperatures, dehydration, and electrolyte imbalances have been proposed as contributing factors to the development of NMS (8). Upon the patient's initial presentation to the emergency department, elevated levels of urea and creatinine were noted. Muscle rigidity and rhabdomyolysis observed in NMS lead to the release of myoglobin from muscle cells. Myoglobin exerts toxic effects on renal tubules, potentially resulting in acute kidney injury. In our case, the markedly elevated CK level (3,120 U/L) supports this mechanism. In addition, the patient's insufficient fluid intake and possible dehydration may have impaired renal perfusion, contributing both to transient elevations in renal function tests and to increased susceptibility to NMS. Dehydration and electrolyte imbalances are recognized risk factors for NMS. During intensive care follow-up, renal function tests rapidly normalized with appropriate fluid therapy, indicating that the renal impairment was not permanent and was most likely secondary to rhabdomyolysis and/or dehydration.

The clinical course of NMS is heterogeneous. There are four primary symptom clusters associated with NMS: hyperthermia, muscular rigidity, altered mental status, and autonomic instability (1,8). However, in the early stages of NMS, muscular rigidity may not be sufficiently developed, and CK levels can remain within normal limits (1,8). It has been reported that cases associated with atypical antipsychotics may present atypically, potentially leading to missed diagnoses in the absence of classic features (1). Nevertheless, despite receiving an atypical antipsychotic, our patient exhibited symptoms from all four major clusters, and her CK level was markedly elevated. These findings are consistent with the Levenson criteria and the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) diagnostic standards (21,22). Differential diagnoses were systematically evaluated. First, infectious causes presenting with fever and altered mental status (pneumonia, sepsis, meningitis, encephalitis) were investigated and ruled out. Cranial CT revealed no evidence of acute or subacute ischemia or hemorrhage, and magnetic resonance imaging was deemed unnecessary. Cerebrospinal fluid analysis was normal, showing no cell elevation or protein/glucose imbalance indicative of infection. Blood cultures were negative. Although chest CT demonstrated a minimal consolidation area in the right lung, this finding was not sufficient to account for the patient's clinical presentation (rigidity, marked elevation of creatine kinase). Moreover, C-reactive protein and procalcitonin levels were mildly to moderately elevated, but not at levels consistent with sepsis or severe pneumonia.

Metabolic disorders and withdrawal syndromes were also considered; however, electrolyte values, thyroid function tests, and blood glucose levels were all within normal ranges. Malignant hyperthermia was excluded based on clinical history and the absence of relevant pharmacologic triggers. In light of these data, given the temporal relationship with antipsychotic administration, the presence of typical NMS features, and the exclusion of alternative diagnoses through laboratory and imaging studies, a diagnosis of NMS was established in this case.

Mortality rates associated with neuroleptic malignant syndrome (NMS) have reportedly declined over the years (23). However, despite appropriate treatment, a mortality rate of approximately 10% still persists (1). In a study utilizing data from a spontaneous adverse event reporting database in Japan, it was reported that 34 out of 260 NMS cases linked to oral aripiprazole use (13.1%) resulted in death (11). In contrast, no fatalities were reported among 15 cases associated with aripiprazole LAI

use in the same study. Nonetheless, another case report described a 40-year-old female patient who had been receiving aripiprazole LAI and presented without early rigidity. In that case, a delayed diagnosis was followed by a rapid deterioration involving acute renal failure, cardiovascular instability, and malignant arrhythmia, ultimately resulting in death (19). Known risk factors for NMS-related mortality include advanced age, infections, respiratory failure, renal failure, and cardiac failure (1). In our case, the patient's symptoms were typical of NMS, which facilitated early diagnosis and prompt initiation of treatment in the ICU. Renal function normalized rapidly, cardiac function remained preserved, and symptoms regressed significantly with supportive therapy.

NMS is reported to be twice as common in males compared to females. While it can affect individuals of all ages, the risk is considered higher among males under 40 years of age (1). Our patient, by contrast, was a relatively older woman. Despite her age, gender, and the use of antipsychotic was “atypical”, the clinical presentation was “typical” for NMS. In conclusion, it should be emphasized that NMS can occur at any age and in association with any antipsychotic medication.

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Shifts in developmental milestones and the reality of modern adulthood transitions: Emerging adults and failure to launch

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Dear Editor,

Historically, adulthood was defined by specific milestones, such as working, marriage, and having children (1). However, these traditional markers are less prominent today. The current generation tends to favor more individualistic criteria (2). As a result, the transition to adulthood has become more gradual, ambiguous, and heterogeneous.

Several factors have contributed to the growing delay in reaching traditional markers of adulthood. Extended education is often associated with continued coresidence and financial interdependence between young adults and their families (3). Individual and global economic conditions, such as fluctuations in income, employment opportunities, and housing affordability, have also been associated with later residential independence and increased rates of return to the parental home (4, 5). Beyond these factors, mental and physical health conditions, and access to emotional and social support may also influence decisions regarding cohabitation (4, 6). On the other hand, individuals can show emotional maturity, financial responsibility, and autonomy in decision-making while still living with their parents and relying on them financially (7). From a social and psychological standpoint, three consistent criteria have evolved as identifiers of adulthood for young people: Assuming responsibility for oneself, making independent judgments, and attaining financial independence (8).

Jeffrey Arnett (2000) coined the term "emerging adulthood (EA)" to describe a distinct life stage. While not universally recognized, EA is typically characterized by exploration, instability, self-focus, and a sense of being 'in-between' adolescence and full adulthood (8). It reflects a prolonged transition into adult responsibilities, including extended education, a later entry into stable careers, and delayed constant intimate relationships (8, 9). By their mid-to-late 20s, many individuals feel that they have reached adulthood (2). However, postponing traditional milestones of adulthood has become more socially acceptable; nonetheless, some individuals experience significant difficulty in navigating this transition. Even those who appear successful may experience internal conflict and dissatisfaction, masking instability beneath outward functionality (7,10). Thus, what initially appears to be a smooth transition may, over time, reveal hidden struggles with autonomy and identity.

Eli Lebowitz (2016) coined the term "Failure to Launch (FTL)" to describe individuals in late adolescence or young adulthood who continue to live with their parents, rely heavily on them, avoid pursuing higher education or stable employment, and exhibit strong emotional or behavioral reactions when their parents attempt to reduce their dependency (11). Although Lebowitz (2016) noted that those affected often show little interest in seeking treatment, in reality, individuals with FTL may struggle with anxiety, depression, and feelings of shame and isolation as they watch their peers progress (12).

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These concepts raise broader questions about how young adults can build meaningful lives in the face of challenges such as economic uncertainty and political and social polarization. Cross-cultural studies are needed to comprehend how different societies define adult development and to investigate the factors that support or hinder a successful transition to adulthood. Interventions targeting autonomy, coping skills, and family communication could help bridge the gap between dependence, reliance, and independence.

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