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Contents

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NOFOR. 2024;3(1):1-5

Original Article

Evaluation of disability reports received in 2022

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Abstract

Aim: In this study, it is aimed to retrospectively examine the files of patients who applied to the Inonu University Faculty of Medicine, Department of Forensic Medicine Polyclinic between 01.01.2022 and 31.12.2022 and discuss them in the light of the literature.
Materials and Methods: 570 disability files that came to our polyclinic between 01.01.2022 and 31.12.2022 were included in our study. Data regarding the gender of the cases, their age at the time of the incident, the season in which the incident occurred, the localization of the injury, which bone was broken, which bones were broken more according to age, and the provisions of which regulations evaluated the disability rate, were scanned electronically. Data were analyzed with IBM SPSS 22 program.
Results: It was observed that 77% of the cases were adults (18-65 years old), 64.6% were men and 35.4% were women. It was observed that the most incidents occurred in the summer months and the least incidents occurred in the winter months. When bone fractures are examined by age groups, children most often survive the events without fractures. Vertebra and tibia-fibula fractures were most common in adults between the ages of 18-65. It was observed that vertebral fractures were more common in cases over the age of 65.
Conclusion: In the light of these data, we concluded that safety precautions should be taken by examining age and seasonal differences, and that physicians who intervene after the accident should direct their suspicions by knowing the possibilities.

Keywords: Forensic medicine, disability, age

INTRODUCTION

World Health Organization (WHO); It defined the deterioration of psychological, physiological or anatomical integrity, loss or decrease of function as a decrease in the body, and defined the person's inability to perform movements within accepted limits as a result of the prolongation of this deficiency as disability [1]. In our country, traffic accidents, effective action, work accidents, etc. The reports written as a result of determining the permanent damage to the person due to the trauma they experienced after the situations, upon the request of the judicial authorities or individuals, and calculating the disability that occurs by taking into account the regulations, are given names such as disability, handicap, disability report. The reason why the names given vary is due to the changing regulations regarding the year of the accident [1,2].

When we look at the distribution of the malfunctions given in the literature studies, the most common ones are limitation of movement, uncomplicated healed fractures, psychiatric malfunctions, gait disturbance, atrophy, fractures with complications, vertebral height loss, shortness, peripheral nervous system malfunctions, vertebral posterior element fracture, central nervous system malfunctions and cognitive malfunctions. malfunctions and paresis and plegia were observed [3].

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In the prepared reports, temporary incapacity periods as well as permanent/permanent incapacity periods are calculated. When calculating both temporary disability periods and disability rates, accident-related complications (surgery status, fracture healing, infections, etc.) should be taken into account. In a study conducted at Muğla Sıtkı Koçman University, it was observed that 87.4% of the cases underwent surgery due to accidents, 5% of the operated cases had their second and third surgeries, and complications such as fracture union and infections developed in 8% of the cases. For this reason, it is understood that the duration of temporary and permanent disability varies even if the malfunction of the cases is the same [4].

In our study, it was aimed to determine the characteristics of the cases such as age, gender, season of the incident, bone fractures, correlation of bone fractures with age range, and under which regulations they were reported.

MATERIAL AND METHOD

Approval was received from İnönü University Scientific Research and Publication Ethics Board with decision number 2023/5370 dated 12.12.2023. 570 disability files sent to İnönü University Faculty of Medicine Department of Forensic Medicine Polyclinic between 01.01.2022 and 31.12.2022 were retrospectively examined. Files for which a report was previously prepared, but the court or person requested a re-report with a different regulation, or files that were re-reported after additional documents were provided, were also included in the study. The files of patients whose files came to us but did not come for examination, or who had problems obtaining missing documents even if they were examined, were excluded from the scope. Psychiatric cases were not included in the statistics because sufficient data could not be accessed and the accessible diagnoses were not specific diagnoses such as general psychiatric examination.

In order to evaluate the different effects of traumas on a person and the correlation of the degrees of these effects with age, the age range of 1-18 for children, the age range of 18-65 for adults, and the age range of 65 years and above for the elderly, based on the data of the Turkish Statistical Institute, were used [5-7]. Gender, season in which the event occurred, location of the malfunction (lower extremity, upper extremity, head area, vertebra), which bone fractures occur according to age (neurocranium, vertebra, clavicle/scapula, radius/ulna, rib, pelvis, femur, tibia). /fibula) and which regulation was used to prepare the report (Regulation on Disability Assessment for Adults dated 20.02.2019, Regulation on Disability Criteria, Classification and Health Board Reports to be Given to Disabled People dated 30.03.2013, Regulation on Disability Determination Procedures dated 03.08.2013, Regulation on Disability Determination Procedures dated 11.10.2008 The information that took into account the Regulation on the Rate of Loss of Working Power and Earning Power in the Profession, Regulation on Special Needs Assessment for Children dated 20.02.2019) or the regulations were classified, coded and put into the SPSS 22 program and analyzed. Descriptive statistics and frequency tables of the data were created. Distribution of data used and other data; They were compared using Pearson Chi-Square and Linear-by-Linear Association tests.

RESULTS

It was observed that 64.6% of the 570 cases within the scope of the study were men and 35.4% were women. 18.7% of the cases were 1-18. It was observed that 64.6% of the 570 cases within the scope of the study were men and 35.4% were women. It was observed that 18.7% of the cases were between the ages of 1-18, 77% were between the ages of 18-65, and 4.3% were over 65 years of age (Table 1). It was observed that the events in the file occurred most in the summer (31.8%) and least in the winter (15.4%) (Figure 1).

The localization of the symptoms mentioned in the report of the applicants was examined. It was observed that the rate of those who applied to us without any malfunction was 2.8%, the most common malfunction localization was the lower extremity with 30.6%, and the upper extremity malfunctions came in second with 22.5% (Table 2).

When the person's body was examined for fractures and the correlation of fractures with age, it was seen that individuals between the ages of 1 and 18 most frequently survived the events without fractures, with 18.9%. Among those with fractures, the most common fractures were tibia or fibula. In individuals between the ages of 18-65, vertebral fractures were the most common (13.2%), while tibia or fibula fractures were the second most common (12.6%). Vertebra fractures were the most common (20%) in individuals over the age of 65 (Table 3).

While the provisions of the Regulation on Disability Assessment for Adults were taken into account in 49.12% of the files sent to us, it was observed that more than one regulation evaluation request was made in 17.7% of the files (Figure 2).

Table 1. Age range and gender participation

			Age			Total
			1-18	18-65	65-100	
Gender	Male	n	72	286	10	368
		%	12.6%	50.2	1.8	64.6
	Female	n	35	153	14	202
		%	6.1%	26.8	2.5	35.4
Total			107	439	24	570

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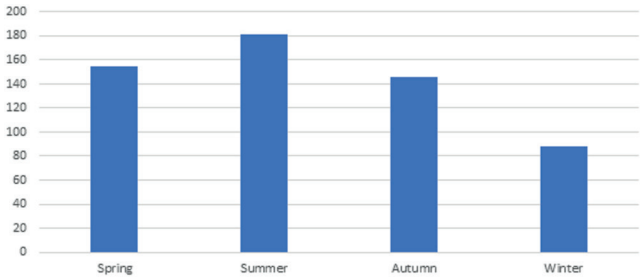

Figure 1. Season

Table 2. Damage localization

	n	%
Upper extremity	221	30.6
Lower extremity	163	22.5
Head	77	10.7
Vertebra	90	12.6
Other	152	20.8
No damage	20	2.8
Total	723	100.0

Table 3. Fractured bone and age correlation

			Age		
			1-18	**18-65**	**65-100**
Fractured bone	**Neurocranium**	**n**	14	38	3
		%	9.8	6.5	7.5
	Vertebra	**n**	4	78	8
		%	2.8	13.2	20
	Clavicula-scapula	**n**	12	31	2
		%	8.4	5.3	5
	Radius-ulna	**n**	5	53	6
		%	3.5	9	15
	Costa	**n**	4	38	5
		%	2.8	6.5	12.5
	Pelvis	**n**	8	31	5
		%	5.6	5.3	12.5
	Femur	**n**	16	50	2
		%	11.2	8.5	5
	Tibia-fibula	**n**	26	74	4
		%	18.2	12.6	10
	No fracture	**n**	27	76	1
		%	18.9	12.9	2.5

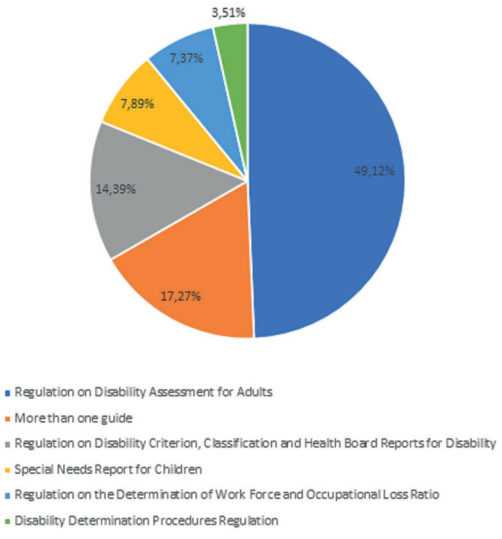

Figure 2. Used guides

DISCUSSION

Studies have shown that the most common cases are caused by traffic accidents and that more reports are made to adult males [3,8]. In our study, it was determined that more reports were issued for adult males, in line with the literature. We think that this data is due to male dominance in traffic. When gender statistics are examined by years, it is seen that the rate of female drivers increased from 19% to 26.8% between 2010-2020 [9]. We expect this data to be balanced between genders as the male density in vehicle traffic decreases.

In our study, it was found that the cases occurred at least in the winter season. It is expected that the number of traffic accidents will increase in winter due to climatic conditions and decreasing sunshine hours, but the number of intercity trips decreases and daylight hours decrease in winter [10]. The decrease in the number of intercity trips in winter and the precautions taken

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by drivers reduce the number of traffic accidents and therefore the number of disability reports written to people. While the number of cases increases in the summer months, the number of cases decreases in the winter months, which is in line with other studies [2,8].

In our study, it was determined that the articles of the current regulation, the Regulation on Disability Assessment for Adults, were mostly taken into consideration when preparing the report [3]. It has been understood that this data is compatible with other studies. We think that the reason for this situation is that the regulation that is most taken into consideration is the Regulation on Disability Assessment for Adults, which is in force, and there is a request from the relevant authorities in this direction. In our study, the fact that requests for more than one regulation came in second place with 17.27% shows that confusion still continues in the field of law and that the question of whether the date of the incident or the date of the case will be taken as basis when preparing the report cannot be answered.

In our study, it was observed that individuals between the ages of 1-18 most often survived accidents without fractures, and second most often, they survived with tibia or fibula fractures. In different studies, it was observed that individuals in childhood survived traffic accidents with or without a single fracture [11]. The data turned out to be compatible. The skeletal system in children is less mineralized, richer in vascular structure, more flexible (lower elastic modulus) and has a thicker periosteum compared to adults [12]. For this reason, it was observed that individuals between the ages of 1-18 suffered lower rates of musculoskeletal system malfunctions in accidents than older age groups. It was seen in literature reviews that individuals in the childhood age group were diagnosed with mental behavioral disorders at a higher rate than other age groups [2].

It is known that the incidence of osteoporosis and sarcopenia (loss of muscle mass) increases with age and reflexes slow down [13,14]. We think that the reason why traumatic fractures (vertebra, wrist and pelvis) are more common as age increases is osteoporosis, sarcopenia and slowing of reflexes.

In our study and other studies in the literature, it has been observed that traffic accidents and related disability reports increase in the summer months. Seasonal and geographical measures should be increased to prevent traffic accidents, which increase due to the increase in seasonal traffic mobility in the summer months.

Although extra precautions are taken for children in vehicles, ergonomic designs should also be planned for adult and elderly age groups, as musculoskeletal system traumas are more common in the elderly.

CONCLUSION

After the accident, psychiatric examination should be considered especially for children, and a long-term treatment plan should be implemented when necessary.

After the accident, health professionals who respond to the accident should classify the cases according to age groups in order not to miss any pathological conditions, and in terms of trauma localizations, extremities should be evaluated carefully for children, and vertebra and rib fractures for elderly individuals.

If an accident occurs despite the precautions and there are sequelae despite the interventions, it should be clearly stated which regulation provisions will be applied in the reports to be prepared in order to prevent loss of time and grievances that may arise.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical Approval
This study was conducted with the permission of İnönü University scientific research and publication ethics board dated 12.12.2023 and numbered 2023/5370.

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Original Article

Evaluation of cases over 65 years of age who applied to Turgut Özal Medical Center forensic medicine polyclinic

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Abstract

Aim: In this study, it was aimed to define the forensic report records of cases aged 65 and over at the time of the incident, to determine the distribution of the incident according to years and months, age, gender, organs affected by trauma, and type of incident.
Materials and Methods: 56 cases whose age was 65 years and above at the time of the incident were retrospectively examined; it was evaluated according to the "Guide for Forensic Medicine Evaluation of Injury Crimes Defined in the Turkish Penal Code" in terms of year, month, type of incident, age, gender, causes of trauma, and injury areas. The cases were evaluated at İnönü University, Department of Forensic Medicine between January 2013 and December 2021.
Results: Of the 56 evaluated cases, 34 (60.7%) were male and 22 (39.3%) were female. The cases were aged between 65-74 with 33 cases (58.9%), and then 75-84 years with 20 cases (35.7%). The mean age was 73.25±6.52 years and the maximum age was 91. Traffic accidents were the most common cause of trauma with 53.6%. Head and neck were the most affected body area.
Conclusion: The damage caused by similar traumas in elderly individuals can be much more than in other age groups. In order to reduce material and moral losses due to trauma, ergonomic designs that will make the lives of the elderly easier in daily life should be used and space-oriented solutions should be preferred.

Keywords: Trauma, 65 years old, forensic reports, forensic cases

INTRODUCTION

Old age is known as an irreversible process of life. [1]. The physiological dimension describes the changes seen with chronological age; the psychological dimension describes the change of orientation in terms of psychomotor, problem solving, perception, learning and individual characteristics as chronological age progresses. [2]. The World Health Organization considers people aged 65 and above as elderly. Our country is among the countries where the elderly population is rapidly increasing [3-5]. The number of elderly patients applying to emergency departments is increasing day by day [6]. Geriatric trauma patients are groups that often have existing comorbidities and are more affected by physical trauma than other age groups [7]. Physical traumas may require long-term hospitalization and more regular clinical follow-up in this age group. [8].

Final reports of forensic cases are prepared based on the Guide for Forensic Evaluation of Injury Crimes Defined in the Turkish Penal Code, published in June 2019. The guide contains answers to questions such as whether the person's injury can be eliminated with simple medical intervention, whether it causes a life-threatening situation, whether it causes a bone fracture, and if there is a fracture, its scoring, whether it causes a permanent scar on the face, and it guides physicians in writing a final report [9]. In this study, it was aimed to determine the characteristics such as the distribution of the event according to years and months, age, gender, organs affected by the trauma, and type of event by examining the final report records of the cases who were 65 years of age and over at the time of the incident.

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MATERIAL AND METHOD

56 cases, aged 65 years and over at the time of the event, for which a final report was prepared between January 2013 and December 2021 at Inonu University, Department of Forensic Medicine, were retrospectively examined. Cases were evaluated for year, month, type of incident (traffic accident, assault, fall, burn, stab wound), age, gender, areas of injury (face, head-neck, thorax, abdomen-pelvis, upper extremity, lower extremity) and life-threatening, simple medical intervention, bone fracture scores, fixed scars on the face, sensation, organ weakness according to the Forensic Evaluation Guide of Injury Crimes Defined in the Turkish Penal Code. While making the evaluations, the Guide for Forensic Medicine Evaluation of Injury Crimes Defined in the Turkish Penal Code, published in June 2019, was used. Age groups were examined in 3 groups: early (65-74), middle (75-84) and advanced (>85) old age. Bone fracture scores were evaluated as mild (1), moderate (2, 3) and severe (4, 5, 6). SPSS 24.0 program was used. Ethical approval was obtained from the Scientific Research and Publication Ethics Committee of Inonu University on 12.12.2023 with the decision number 2023/5372.

RESULTS

Of the 56 cases evaluated, 34 (60.7%) were male and 22 (39.3%) were female (Table 1). The cases were divided into 3 groups: 65-74, 75-84 and over 85 years of age (2). The ages were mostly between 65-74 with 33 cases (58.9%), then 75-84 with 20 cases (35.7%) (Table 1). The average age was calculated as 73.2±6.52 (age range, 65–91 years).

Table 1. Gender-age range

		Years			Total
		65-74	75-84	85<	
Male	**n**	19	14	1	34
	%	33.9	25	1.8	60.7
Female	**n**	14	6	2	22
	%	25	10.7	3.6	39.3
Total		33	20	3	56

When the distribution of cases by months is examined; it was observed that 12 cases (21.49%) were admitted in October and 8 cases (14.3%) were admitted in July, respectively. When sorted according to seasonal distribution, it was seen that the most cases were in autumn with 22 cases (39.3%) and the least cases were in spring with 9 cases (16.1%). When the distribution of incident types according to seasons was examined, it was determined that traffic accidents occurred most in autumn (n: 13) and least in spring (n: 4).

Traffic accidents were the most common cause of trauma with 53.6%, cases caused by assault were in the second place, and falling cases were in the third place (Table 2). When the injury areas were evaluated, it was seen that the cases received trauma mostly from the head and neck region (n: 22), followed by the lower extremities (n: 19) (Table 3). Bone fractures occurred in 28 cases, and when the fracture degrees were evaluated, it was seen that 1 case was rated as mild, 11 cases as moderate, and 16 cases as severe.

Table 2. Event type

	n	%
Traffic accident	30	53.6
Assault	20	35.7
Fall	3	5.4
Burn	1	1.8
Cutting and stabbing injury	2	3.6
Total	56	100

Table 3. Correlation between incident type and injury sites

		Event type					Total
		Traffic accident	Assault	Fall	Burn	Cutting and stabbing injury	
Body part	**Face**	5	11	0	0	1	17
	Head-neck	9	10	2	0	1	22
	Thorax	15	1	1	0	2	19
	Abdomen-pelvis	7	6	0	1	2	16
	Upper extremity	8	7	1	1	0	17
	Lower extremity	11	7	0	1	0	19
	Vertebra	6	0	0	0	0	6
Total		61	42	4	3	6	*116

*The reason why the total is more than the number of cases is that in some cases there is more than one injury site.

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It was observed that the majority of life-threatening cases (n: 13) were caused by traffic accidents. When traffic accidents were evaluated individually, it was seen that the majority of them were non-vehicular traffic accidents (n: 16) (Figure 1). It was observed that traffic accidents were most common in the 65-74 age group (n: 20).

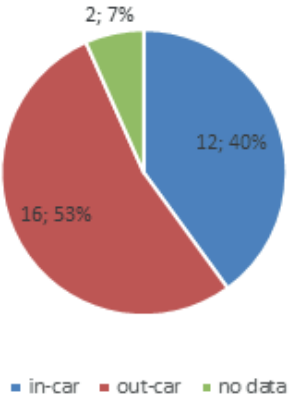

Figure 1. Traffic accident types

It was observed that there was a life-threatening situation in 22 of the cases, it was not in 34 cases, and in 16 cases the injury was mild enough to be resolved with simple medical intervention, and in 40 cases it was not so mild that it could be resolved with simple medical intervention (Table 4).

Table 4. Simple medical intervention and life-threatening correlation

		Simple medical intervention		Total
		Not necessary	Necessary	
Life threatening	**Exist**	0	22	22
	Absent	16	18	34
Total		16	40	56

When the cases are evaluated in terms of fixed scars on the face; It was determined that 1 person had a fixed scar on the face (1.8%), 45 cases did not have a fixed scar on the face (80.4%), and 10 cases were called for a follow-up examination but did not come for a check-up. When the cases were evaluated in terms of whether sensory-organ weakness occurred or not, it was seen that there was no sensory-organ weakness in 30 cases, 25 cases were called for a control examination for re-evaluation but did not come for control, and sensory-organ dysfunction was reported in 1 case (Table 5).

Table 5. Sense-organ weakness

	n	%
Negative	30	53.6
Loss of sense-organ function	1	1.8
Control	25	44.6

DISCUSSION

In our study, which was carried out with the aim of taking precautions against the characteristics of trauma in the elderly and these types of trauma, 56 cases aged 65 and over, for whom forensic reports were prepared in a period of 8 years, were examined.

In our study, the number of male cases was found to be higher, consistent with other similar studies [4,10-13]. We think that the reason for this is that the applications made to us requesting a final report are mostly traffic accidents and the majority of vehicle drivers are men [13].

In our study, it was observed that the number of cases in the early senescence stage was higher than in other stages. When looking at the literature, it was seen that similar results were obtained [4,12,13,14]. We think that this is because patients in the early senility phase are more mobile than other age groups, participate more in social life, and are therefore more exposed to external factors.

It is observed that the majority of trauma cases in people older than 65 years are caused by traffic accidents (53.6%). Consistent with the literature, traffic accidents are the leading cause of trauma [4,10,12,13,14,15]. It was thought that the slowdown in physiological functions of the elderly caused them to be vulnerable in traffic accidents.

When we look at the types of incidents, it can be seen that the majority of traffic accidents are followed by violent actions and falls. When the literature is scanned, in a similar study conducted by Güler et al. in 2020, it was found that the majority of the cases were between the ages of 65-74 and the majority were men, traffic accidents were the most common cause of trauma, and when traffic accidents were evaluated in themselves, non-vehicle accidents were the majority; similarly, in our study; It was observed that men were the majority in trauma cases over the age of 65, the most common cause was traffic accidents, and when traffic accidents were evaluated within themselves, non-vehicular accidents were the most frequently recorded [12]. It is noteworthy that in other studies in the literature, falls are in the second place, and in some cases, effective action events come second [4,10,13,14]. Considering that the elderly spend more time at home than outside and that the home design is not suitable for the elderly, it is inevitable that there will be more fall cases than assault events.

As a result of our study; in injury cases over the age of 65, it varies from event type to event type, but when all event types are evaluated together, it is seen that the most affected area is the head and neck. It is known that injuries in the head and neck area can cause permanent disabilities, and injuries in the facial area can cause permanent scars and permanent changes on the face. According to Article 87 of the Turkish Penal Code, one of the issues that should be taken into consideration in these cases is whether the injury causes permanent scars on the face [16]. In the literature review, it was seen that there are studies showing that the head, neck and extremities are the most frequently injured trauma areas [3,10,13,15]. The reason for the frequency of head and neck injuries was evaluated as not fastening the seat belt in

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in-vehicle traffic accidents and loss of head control after high-energy trauma, and the reason for the frequency of extremity injuries, which include the longest bones in the skeletal system, was evaluated as the decrease in reflex responses and osteoporosis with advanced age in out-of-vehicle traffic accidents.

CONCLUSION

Considering that the most common cause of trauma in the elderly is traffic accidents, necessary arrangements should be made to prevent traffic accidents (pedestrian crossing markings, speed bumps, wide intersections, lighting, etc.), and it should not be forgotten that the elderly are also a part of the society and therefore the traffic. In accordance with the 1st and 2nd paragraph of Article 87 of the Turkish Penal Code, care should be taken to keep careful and detailed records, especially in head-neck and facial injuries, in order to clarify whether the injury is a permanent scar or a permanent change on the face. In order to reduce material and moral losses due to trauma, ergonomic designs that will make the lives of the elderly easier in daily life should be used (carpet stabilizers, door handles, etc.) and space-oriented solutions should be preferred.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

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Ethical Approval
Approval was obtained from the Scientific Research and Publication Ethics Committee of İnönü University on 12.12.2023 with the decision number 2023/5372.

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Original Article

Evaluation of cases applying to forensic medicine polyclinic due to firearm injuries: Ordu example

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Abstract

Aim: This study aims to understand the key characteristics of firearm injury cases in light of the current literature, which are on the rise with an increase in individual armament across the globe in recent years.
Materials and Methods: In this study, cases of people with firearm injuries—who had applied to the Forensic Medicine Polyclinic of Ordu Training and Research Hospital between 2017 and 2022—were retrospectively examined in terms of their sociodemographic and wound characteristics, as mentioned in their records.
Results: Of all the cases recorded in the period mentioned above, 0.86% had applied to the Forensic Medicine Polyclinic due to gunshot wounds, with 93.9% cases involving men and 6.1% involving women. Approximately one-third of these cases had bone fractures, and the average hospitalization period was six days.
Conclusion: Although the rates of firearm injuries in women and children are low, raising awareness in terms of the great cost it bears for society, along with a decrease in individual productivity, remains crucial.

Keywords: Gunshot, forensic medicine, wound

INTRODUCTION

The increase in individual armament has been noteworthy in recent years, not only globally but also in Türkiye. The 2017 data from the United Nations Office on Drugs and Crime mentions the use of firearms in 54% of homicides worldwide [1]. In the United States, in 2020, 79% of all homicides and 53% of all suicides were committed with firearms, and this rate increased by 35% from 2019 to 2020 [2].

Despite prohibitions in carrying and using firearms without a permit posed by firearm control laws in Türkiye, the widespread illegal acquisition of guns remains noteworthy [3]. According to 2021 data from the Turkish Statistical Institution, 26.3% of suicides were committed with firearms [4]. Even 7.3% of trauma cases admitted to the university emergency department in Gaziantep every four years have been reported to be related to firearm injuries [5].

This study aims to contribute to the literature by reviewing the sociodemographic characteristics, severity, frequency, etc. related to gunshot injuries in cases exposed to firearm injuries.

MATERIAL AND METHOD

This study was approved by the Ordu University Clinical Research Ethics Committee on May 12, 2023, with decision number 141. In this study, the cases of people with firearm injuries—who had applied to the Forensic Medicine Polyclinic of Ordu Training and Research Hospital between 2017 and 2022—were retrospectively examined. The sociodemographic characteristics of the cases—such as the injured area, the year of the incident, the number

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of wounds, the severity of the wound(s), and whether the case underwent surgery—were investigated. Descriptive statistics were given as percentages and mean±standard deviation. The chi-square test was performed on a slope. Statistical significance was $p<0.05$.

RESULTS

Between 2017 and 2022, 3825 final reports were prepared in our polyclinic, with 0.86% (n=33) of the cases related to firearm injuries. When examined in terms of years, the ratio of the total number of final reports to that of firearm injury cases was found to be highest in 2017 at 1.87% and lowest in 2021 at 0.42%. It was determined that 54.54% (n:18) of the cases were from the city center; the other cases were from the districts, with no cases reported from outside the city.

Of the cases, 93.9% (n=31) were men, and 6.1% (n=2) were women. The youngest case was that of a 9-year-old, the oldest case was that of a 65-year-old, and the average age was 33.88±14.21. According to the records, 100% of cases of women (n=2) and 90.3% cases of men (n=28) were found to be those of "nonaccidental injury." Two cases, both belonging to the male gender, were in the childhood age group of 9 and 11 years old.

According to the slope chi-square test, the number of shots was found to be lower in short-barreled weapons and higher in long-barreled weapons ($p<0.05$; $x^2=14.128$). The most injured body part was in the lower extremities, that is, 54% (n=16), followed by 23% (n=7) in the upper extremities, with 10% (n=3) in the abdomen, 10% (n=3) in the chest, and 3% (n=3) in the neck area.

Of all the cases, 37.3% (n=9) had bone fractures, 15.2% (n=5) had a single bone fracture, and 12.1% (n=4) had multiple bone fractures. The distribution of broken bones is shown in Table 1.

Table 1. Percentage distribution of broken bones

Broken bone	n	%
Metatarsal	5	31.25
Rib	3	18.75
Tibia	3	18.75
Fibula	2	12.50
Phalanx	2	12.50
Scapula	1	6.25
Total	16	100

Of all the cases, 33.3% (n=11) underwent surgery, from which the shortest hospitalization period was 1 day, while the longest was 22 days, with an average hospitalization period of 6 days. The characteristics of the hospitalized cases are detailed in Table 2. The medical treatment cost invoices were obtained for 14 patients, and when the average medical treatment cost was calculated, it was found to be 1943 Turkish Liras (TL).

Table 2. Characteristics of hospitalized cases

Gender	Age	Operation type	Hospitalization period (Day)
Male	42	Liver and intestinal repair	2 days
Male	42	Tibia fixation, popliteal artery repair	3 days
Male	41	Flap application to the left arm	1 day
Male	55	Phalanx fixation	2 days
Male	30	Femur fixation, femoral artery repair, fasciotomy, embolectomy	22 days
Male	24	Knee diagnostic arthroscopy, debridement	5 days
Male	44	Femoral artery repair	4 days
Male	41	Liver, kidney repair	8 days
Male	23	Liver, stomach repair	12 days
Male	22	Tendon repair, bone graft	5 days
Male	24	Removal of a deep foreign body	1 day

The summer season had the highest rate (31%) of firearm injuries. Upon examination of the report results, only 8 cases (24.24%) were considered to have life-threatening injuries.

DISCUSSION

Although most firearm injuries often lead to fatal consequences, nonlethal injuries are also observed. The socioeconomic structure of society, gun culture, degree of accessibility to firearms, and many other factors can contribute to regional differences in the incidence of firearm injuries. According to a report prepared by the Umut Foundation in 2022, the Black Sea region ranks fourth, with 543 incidents of armed violence. According to the same report, a 3.63% increase in violent occurrences was observed in the Mediterranean region in a year, ranking third. In addition, Ordu province has reported 18 fatalities and 45 injuries due to armed conflicts [6].

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In the literature, among all forensic cases received in the emergency department, the proportion of firearm injuries has been reported to range from 0.68% to 4.7% [7,8]. The rate of firearm injuries applied to a hospital in Mersin Province has been reported to be 3.2% in one year [9]. This study found that of all the cases, 0.86% involved a firearm injury in Diyarbakır, 15.7% [10] in Adıyaman, 11.05% [11], and in Eskişehir, 0.69% [12] Proportional differences may arise in studies conducted in different geographical regions and sociocultural societies.

A study carried out in Elazığ's emergency department revealed that of the 55 individuals with firearm-related abdominal injuries, 92.7% were men [13]. Of the 142 patients in another trial conducted in the emergency department, 91% were men [14]. According to a study conducted in Adana, of the 1046 cases of women who presented at the forensic medicine clinic while suffering from firearm injuries, 12 were over the age of 18 [15]. The literature suggests a higher rate of firearm injuries among men, which is supported by the results of this study. The reason for this situation may be the active participation of men in social life as well as incidents involving armed violence.

The average age of those examined in this study was 33.88±14.21, whereas the average age in a study conducted in the emergency department in the Şırnak region [16] was reported as 27.31±11.02. Studies indicate that, despite the limited information in Türkiye about mortality rates, sequelae, etc., child mortality rates from firearm injuries have increased, especially in recent years [17,18]. Only 2 of the 262 children who underwent five years of follow-up care in the pediatric surgery service in Konya due to trauma were reported to have had gunshot injuries [19]. The number of pediatric cases in this investigation was similar to that reported in the literature. While the increase in acts of armed violence especially affects young adults who participate in social life, it also affects individuals who may be in that environment, such as women, the elderly, children, and the disabled, who need social support. Hence, comparing the increase in acts of armed violence and the sociodemographic characteristics of people exposed to violence in these incidents will contribute to the literature.

In this type of injury, the most common injury areas are the lower extremities and the abdominal region [20]. A review of research carried out in the emergency department in Ankara, 24 out of 142 cases of gun-related injuries died despite treatment. According to the same study, the most commonly injured area (48%) was the lower extremities [14]. This study had similar results in that the most common injury area (54%) was the lower extremity region.

According to the findings of the Elazığ's sample, 37 cases (67.3%) were injured with long-barreled weapons and 16 cases (21.7%) with short-barreled weapons [13]. A study carried out in an emergency department in England revealed that 12 patients had multiple injuries, while 32 patients had a single injury [21]. In this study, 21 cases had a single wound, and 12 cases had multiple wounds. In addition, the low number of shots and wounds with short-barreled weapons were found to be statistically significant. Due to the ammunition structure, the number of wounds in short-barreled weapons may be lower than in long-barreled weapons. In long-barreled weapons, as the shooting distance increases, the change in the number of wounds depends on the distribution of the pellets.

Based on the final reports of research conducted at a military hospital in Ankara, 12.5% of the cases had firearm injuries, and around half of those cases were considered life threatening. This rate was 24.2% in this study; variations in the assailant and patient profiles were assumed to be the cause of the observed variation in the rate.

It is commonly known that injuries caused by firearms require expensive medical care. According to an American study, the yearly cost of lost productivity as a result of firearm-related injuries is projected to be over 35 billion dollars [22]. For this study, we were able to access the treatment cost invoices issued to the Social Security Institution for only 14 cases out of 33 cases, the reports of which are given, and for informative purposes, we stated that this value was 1943 TL. This value includes only the costs related to emergency services and minor surgical operations during the incident and not other financial losses, such as the costs of working days when the person is on sick leave and cannot work, rehabilitation expenses, and forensic medicine report fees.

CONCLUSION

In conclusion, this study highlights the sociodemographic and injury characteristics of cases admitted to the forensic medicine polyclinic in Ordu due to firearm injuries. The study reveals that firearm injuries are more prevalent among males and predominantly affect the lower extremities. Considering the significant societal costs and the negative impact on individual productivity caused by firearm injuries, it is crucial to emphasize the importance of awareness campaigns and regulatory measures. In this regard, reducing firearm injuries requires preventing the use of unlicensed weapons, reviewing the criteria for purchasing licensed weapons, and raising social awareness. Creating consciousness across all segments of society and implementing educational programs will play a key role in mitigating such injuries. To reduce the rate of injuries caused by firearms, preventing the use of unlicensed weapons, reviewing the criteria for purchasing licensed weapons, and raising social awareness are required.

The limitation of this study is that only hospital records, personal statements, and data were assessed retrospectively. Crime scene information, characteristics of the perpetrators, and the nature of the incident could not be evaluated in detail since investigation files could not be obtained. Another limitation of this study is that the long-term effects of trauma on individuals surviving firearm injuries are not discussed.

This study was presented as an oral presentation at the IV. International Turaz Academy Congress held in Antalya Belek during October 26–29, 2023.

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Conflict of Interests
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Ethical Approval
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Case Report

Sexual abuse in health care: A case report

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Abstract

Patients under anesthesia are in a state of immense vulnerability. Although rare, such situations create an environment that may lead to abuse. A notification was made to the relevant judicial units by employees working in a private hospital. The notification reported that an anesthesiologist working in the same hospital put the patients under semi-anesthesia after cesarean section surgery back to sleep with active ingredient propofol in the recovery room and then abused them by having anal and oral intercourse. Technical investigation was conducted by the forensic units. Sexual abuse was recorded by hidden cameras placed in the recovery room. Active ingredient propofol and an injector were found at the crime scene, and biological samples were acquired. In conclusion, studies on abuse in health care (AHC) should be increased. We believe that the use of digital measures to prevent abuse, such as placing closed-circuit TV systems in hospitals, will be a deterrent.

Keywords: Abuse, health care, sexual

INTRODUCTION

Abuse during the delivery of health care services is a recent and complex issue [1]. Various studies on abuse in health care (AHC) have reported the prevalence of this phenomenon as 24% in Denmark, 25% in Finland, 28% in Iceland, 13% in Norway, and 20% in Sweden [2]. AHC can be categorized as neglect, verbal abuse, physical abuse, and sexual abuse [3]. Sexual abuse of patients by physicians is a rare yet persistent problem that can lead to considerable psychological and emotional harm [4]. Very few victims of abuse report [5]. Sexual abuse appears to be quite common in gynecology and obstetrics [6]. Sexual assault; It is essentially defined as a crime of violence committed on the body of another person, causing fear, helplessness and physical pain [7]. This is rare to see in healthcare. There is no published report on this subject in Türkiye. In the present study, the patient who was exposed to sexual abuse by the anesthesiologist has been evaluated and the measures that can be taken in these situations have been discussed.

CASE REPORT

The incident took place in a private health institution in a city center in Eastern Türkiye. This private health institution is located in a low socioeconomic suburb of the city. A notification was made to the prosecutor's office by the employees working in the private hospital (Job descriptions of the individuals are not known since the witness is protected under confidentiality, but the statements reveal that the informants are health personnel). Witness statements detailed that the patients in the recovery room were put to sleep by the anesthesiologist on duty with active ingredient propofol. The door was locked from the inside, and anal intercourse was performed in the room. The patients who should normally be lying on their backs were on their sides or in an inverted position, and their bottoms were extending out of the stretcher. When the informants examined the anal area of one of the patients, they saw ejaculate on the area. The patients in the recovery room were put under general anesthesia, they saw ejaculate residues on the front of the doctor's apron and on the

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floor. The informants stated that they made the notification after severe conscientious discomfort, and there were other employees who had witnessed the incident too. After the notification was made, necessary actions were taken by the prosecutor's office for physical surveillance via camera, search, and collection of biological samples. The footage obtained from hidden cameras placed in the recovery room was examined. The prosecutor's report stated that the perpetrator attempted to anally assault the female patient who came out of the surgery and was waiting in the recovery room. The law enforcement officers, who were waiting at that time, took action to arrest the person. The forensic specialist performed an anal examination and took swab samples for DNA analysis on the night of the incident with the order of the prosecutor's office. Material evidence of anal assault was obtained, and the DNA of the perpetrator was found in the swab samples taken from the anal region of the victim. Active ingredient propofol was found in the chemical analysis of the injector in the recovery room, and Lidocaine was detected in the recovery room. Furthermore, 2113 pornographic videos were identified on the hard disk seized from the perpetrator's office. The person was arrested by the judicial authorities.

DISCUSSION

AHC is defined as any act that is perceived as harassment or abuse by the patient while receiving health care [8]. In a study conducted in five Northern European countries, the rate of AHC during the reception of gynecological health services has been reported to be between 13% and 28% [6]. In another study, the prevalence of maltreatment during lifelong health care has been documented as 14% [9]. The maltreatment in question can be any kind of abuse, but it is mostly neglect and verbal violence [10]. Guidelines are being carried out to prevent abuse in health services. These are mostly developed with information obtained from patients and their relatives [11]. Studies show that incidents involving sexual abuse are rare. It has been stated that awareness on the sexual abuse of a female patient by a male physician is twice as high among female health care professionals as among their male counterparts [12]. In the present study, the informants who reported the incident were other health workers employed in the same hospital. Health workers stated that they suspected sexual abuse many times before the incident in question, but could not gather the courage to file an official notification. Studies show that inhumane behavior is possible as long as tolerance or ignorance plays a role or remains acceptable [13]. Ethical guidelines drafted for the prevention of AHC are insufficient in practice [14]. In cases where the perpetrator is a physician, it is very difficult for health workers at a lower hierarchical level to initiate notification procedures. The risk of losing their job if the name of the hospital is mentioned and the lack of legal assurances in this regard lead to the hesitation to report such incidents. Patients recovering from surgery being sexually abused by a physician is a highly serious allegation. Judicial units cannot initiate investigations, including arrests, based on witness statements alone. In the present case, the prosecution made attempts to obtain concrete evidence, and strong evidence was obtained after the investigation.

CONCLUSION

In conclusion, studies on AHC should be increased. We believe that digital measures to prevent abuse, such as placing closed-circuit TV systems in hospitals, will be a deterrent. Legal guarantees should be made that health workers who make such notifications will not lose their jobs, and in-service trainings to encourage such notifications should be planned and implemented.

Conflict of interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
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Informed Consent
Informed consent was taken from the patient.

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Review Article

Relationship between impulsivity and Obsessive-Compulsive Disorder (OCD) in forensic sciences

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Abstract

Obsessive-compulsive disorder (OCD) is a neuropsychiatric disorder characterized by repeated unwanted thoughts, repetitive behaviours and rituals to reduce these thoughts. OCD is often seen together with other psychiatric disorders such as anxiety and depression. Although it may seem similar, often the urge to perform certain behaviours or act in certain ways is sometimes confused with impulse control disorder. Impulsivity is a trait associated with low impulse control, impaired cognitive functioning, and risky behaviour. Impulse control disorders include disorders that affect the ability to control behaviour and can lead to behavioural addictions, such as gambling addiction. It is argued that impulsivity is associated with neurotransmitters, genetic factors and brain structure and that impulsive behaviours have neurological bases. Neurotransmitters such as dopamine and serotonin have been associated with impulsivity. Candidate genes associated with impulsivity and aggression have been shown to alter the function of neurotransmitters. The relationship between psychiatric illnesses and criminality has been the subject of intense debate and investigation by many researchers in recently. Although there is no direct connection between OCD and criminal behaviour, there are some behaviours that can be considered "behavioural addiction" in the “Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition”(DSM-5), such as gambling addiction and compulsive stealing. It is an undeniable fact that individuals with impulse control disorders are prone to criminal acts. The relationship between OCD and impulse control disorder has therefore attracted the attention of forensic sciences and has been examined multidisciplinary.

Keywords: Obsessive-compulsive disorder, psychiatric genetics, impulsivity, behavioural genetics

INTRODUCTION

The relationship between psychiatric illnesses and criminality has been the subject of intense debate and investigation by many researchers in the recent past. Although the renewed focus on the importance of mental health and media attention following tragedies such as grand thefts and murders is a positive development, the relationship between mental illness and criminality has been a matter of curiosity. Popular belief is that people with mental illness are more likely to commit acts of violence and aggression. The perception of psychiatric patients as dangerous individuals often stems from the media portrayal of criminals as “crazy” individuals [1,2].

Obsessive-compulsive disorder (OCD) is a neuropsychiatric disorder characterized by recurring intrusive disturbing thoughts and repeating behaviours or rituals performed to calm anxiousness. It often accompanies other psychiatric disorders, especially anxiety and depression [1]. Obsessions are recurring thoughts, images, and urges that people perceive as intrusive and unwanted. Compulsions are repeated actions, behaviourally and cognitively, in response to obsessions [2]. OCD has the potential to have a negative impact on life quality in general, especially education, employment, career development and relationships.

Patients with obsessive-compulsive disorder often feel shame and guilt about their condition. Especially when compulsions attract public attention, patients with insight may feel ashamed of their behaviour and fear being labelled. Since it takes a long time for individuals with OCD to start treatment, the disease usually

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follows a chronic course. A major reason for this delay is the fear of embarrassment, judgment and stigma that comes with the symptoms [2,3].

OCD can be characterized by repeated unwanted ideas, urges, and images. It often progresses with some comorbid psychiatric disorders. Studies have shown that OCD is frequently seen together with mood and anxiety disorders among Axis I disorders [4].

Impulsivity and OCD

The inclination to respond quickly and impulsively, regardless of the potential consequences, to internal or external stimuli is known as impulsivity. The behaviours of people who struggle with impulse control, defined as the ability to manage one's behaviour in response to a disturbing emotion or situation, often display similar characteristics to individuals with OCD. Both OCD and impulse control disorder involve the unable to resist the urge to perform certain behaviours or act in certain ways [5]. Although compulsiveness and impulsivity are seemingly conceptualized as mutually opposite, the relationship appears to be more complex than that. Compulsiveness and impulsivity can occur simultaneously in the same disorder, or they can occur separately at different times. People with both disorders may find it difficult to ignore their compulsions and may be driven by intrusive thoughts or obsessions. People with OCD may have thoughts that they feel the need to check before leaving the house, such as making sure all the doors are locked several times, the stove is off, and the iron is not working. People with OCD often interpret the meaning of their compulsions differently than people who suffer from impulse control problems. For example, someone with OCD may believe that performing a particular compulsive action, will prevent something terrible from happening, such as hurting a loved one. On the other hand, a person with impulse control problems may engage in an activity because it gives them pleasure or relief, whether it does.

Impulsive behaviour can be dangerous and lead to serious consequences. People with impulse control problems may engage in activities such as gambling, excessive shopping, or drug use. Compulsive behaviours, on the other hand, are often done to relieve anxiety or distress.

They may also have rules to follow to make them feel good, such as counting items a certain way before going to bed. When these compulsions are not acted upon, the person may experience extreme anxiety or distress.

Individuals with OCD may resort to violence in some situations. There may be several reasons for this situation. For example, if someone else unintentionally or intentionally disrupts the obsessive thoughts of the person with OCD, tries to prevent them, or breaks the rules without justification, this may cause the individual with OCD to turn to crime and violence.

Although OCD does not definitively cause criminal behaviour, some research suggests that individuals with OCD may have higher rates of criminal behaviour than the general population. obsessive-compulsive personality disorder (OCPD) subtype is associated with rigid perfectionism, rigidity, and a strong need for control. These characteristics can lead to an increased risk of criminal behaviour if they are directed towards illegal activities.

OCD significantly affects daily life and social interactions and is not usually associated with criminal behaviour. However, some research suggests that individuals with OCD may be more prone to impulsivity, which can potentially lead to criminal acts. While there is no direct link between OCD and criminal behaviour, there are some behaviours that can be considered "behavioural addiction" (gambling disorder-GD and compulsive stealing) in the DSM-5. As a result of the studies, it has been revealed that individuals with behavioural addictions may be more likely to engage in criminal behaviour due to their impulsivity and inability to control their actions [6].

When it comes to their negative outcomes, phenomenology, and natural history, behavioural addictions are very similar. Phenomenologically, individuals with behavioural addiction often display dysfunctional impairment (disregard for other facets of life and narrowing of interests), impaired control (desires and fruitless attempts to restrict behaviour), and risky use (ignorance of detrimental psychological effects). They exhibit the behaviour of persisting in the behaviour despite the situation.

Impulsivity, which expresses the tendency to act without forethought, has received intense attention in the field of psychiatric research. Research has demonstrated a strong correlation between this behavioural trait and a number of psychiatric conditions, such as Attention-Deficit / Hyperactivity Disorder (ADHD), addiction, bipolar disorder (BP) and personality disorders like Antisocial Personality Disorder (ASPD) and Borderline Personality Disorder (BPD). According to DSM-4, it includes a category of psychiatric disorders called impulse control disorders not elsewhere classified, including kleptomania, Intermittent explosive disorder (IED), pathological gambling, pyromania and trichotillomania. Beyond this classification, impulsive tendencies exhibit a link to crime, with suicidal behaviours, aggression, and self-harming tendencies.

When they first start a behaviour, many persons with behavioural addictions describe feeling tense or aroused, and when they finish the behaviour, they often report feeling relieved or satisfied. This disordered behaviours can progressively change over time from an impulsive, reward-seeking habit to an ego-dystonic, obsessive one. For instance, if you have a gambling disorder, your gaming may become less pleasurable and you may feel pressured to play more to ease your tension or anxiety. Relapses are common in behavioral addictions, despite the fact that many individuals with these diseases recover without seeking professional help. These impulsive behaviors can have negative effects on one's quality of life, seriously affect one's ability to operate in social and professional contexts, and result in new financial and legal obligations [6].

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Gambling addiction (GD) is considered by determined and recurring patterns of maladaptive gambling behaviour. Some gambling addicts have psychopathic personality traits. However, most of them are perfectionists, detail-oriented, controlling, overly responsible and ambitious people, which is often seen in OCD patients. Before they became addicted to gambling, they appeared to be extremely respectable, fulfilling their responsibilities, and ideal spouses and parents. Clinical characteristics of gambling addiction are similar to those of substance use disorders: tolerance, withdrawal, and other unfavorable psychosocial effects; additionally, there are recurrent unsuccessful attempts to quit gaming. Gambling addiction is also marked by cognitive biases that support unfavorable decision-making. These cognitive errors include superstitious beliefs such as performing gambling tasks in a certain order, the gambler's fallacy, and the conviction that an independent event, such as the outcome of a fair coin toss, is more or less likely. It is common to see gamblers chase losses, continue to bet despite repeated losses, and have a sense of control over the outcome. They may also misinterpret reward and loss (for example, non-winning "near-miss" outcomes, which tend to boost their urge to gamble). For those with a gambling addiction, there are numerous gamblers with an addiction can quickly elicit a wide range of intense feelings, including anger, exhilaration, hope, and disgust. Given their diminished capacity for reason or lack of control, it makes sense that some problem gamblers who also have legal issues would look for mitigating circumstances in their sentencing [7].

Kleptomania has been classified as an "obsessive-compulsive spectrum disorder" and an impulse control disorder due to similarities in symptom presentation and response to therapy [8]. It is appropriate to recognize that impulsive behaviour does not always manifest as maladjustment; rather, it may provide advantages in contexts that require rapid reactions and take advantage of unexpected expectations [9].

Impulsivity is a complex behavioural construct, much like many others. The range of impulsive expressions expands to include aggression. This rich diversity of expression styles shows that impulsivity is not a unitary structure. Identifying different forms of impulsivity may advance understanding of the neurobiological basis of diseases of which impulsivity is a component [10].

Impulsivity in humans can be assessed with self-report questionnaires such as the Barratt Impulsivity Scale(BIS-11) [11], UPPS-P Impulsive Behaviour Scale (IBS) [12] and The Impulsivity Rating Scale(IRS). These scales reflect more of the individual's subjective view of his or person’s behaviour; However, some progress has been made in correlating such measurements with differences in brain function. Correlating different impulsivity measurements with brain activations has also been a pioneer in genetic studies.

Impulsivity and Genetic

Aggression evaluated behaviourally has demonstrated a good correlation with biomarkers for gene discovery and candidate gene investigations. Aggression can be reactive or impulsive, and it can be instrumental, purposeful and goal-directed. Disorders that share a genetic predisposition to impulsive aggression include ASPD, BP and IED [13]. The Brown-Goodwin Lifetime History of Aggression (BGLHA) scale is an 11-item questionnaire that assesses aggressive behaviour over the lifetime by counting the number of times each type of aggressive behaviour occurs [14]. Events measured include temper tantrums and violent behaviour against self, property, and others (including authority) in a variety of social contexts; family, work and school. According to BGLHA, aggression is predicted to be associated with testosterone, which is higher in men and is also associated with functional variation of the MAO-A (Monoamine oxidase A) gene. The MAO-A gene has been observed to interact with testosterone levels to predict aggressive behaviour as measured by BGLHA, and FKBP5 (FK506 binding protein5), which encodes a protein involved in the cortisol response, has been observed to interact with stress exposure to predict BGLHA scores [15].

Numerous neurotransmitters and different genes have a role and connected with impulsivity may affect the behavioural responses of these neurotransmitters, according to pharmacobehavioral studies.

Dopaminergic and serotonergic pathways are particularly prominent in the brain areas that control impulses. Neuropharmacological studies using gene knockout and genetic association methods have demonstrated that impulsivity is related to the dysregulated activity of monoamine neurotransmitters. The genes under discussion have been linked to impulsivity and violence, may modify the activity of monoamine neurotransmitters, and have occasionally been investigated for relationships to human reactions to impulsivity [10].

The neurotransmitter most frequently linked to impulsivity is serotonin, especially when it comes to impulsive aggressiveness and suicide. Human and animal models of neurochemical and neurobehavioral research have linked serotonin to impulsivity and violence. Examination of serotonergic biomarkers in violent criminals and alcoholics has revealed that cerebrospinal fluid (CSF) 5-hydroxyindoleacetic acid (5-HIAA) is reduced only in individuals who are impulsive rather than in those who pre-plan aggressive behaviour and violence [16]. In a study conducted in rodents, it was observed that manipulations that reduce 5-HT (5-hydroxytryptamine/serotonin) signaling increased impulsivity and aggression. Aggressive behavior in rodents is decreased as 5-HT activity is increased using 5-HT precursors, 5-HT reuptake inhibitors, or 5-HT1A and 5-HT1B receptor agonists. [17].

A tryptophan hydroxylase 2 (TPH2) haplotype is associated with reduced levels of the serotonin metabolite 5-HIAA in the cerebrospinal fluid (CCSF) and a higher risk of suicide attempt. The TPH2 gene encodes the enzyme that catalyzes the rate-limiting step for serotonin production in the brain [18]. It has been demonstrated that the MAO-A gene, which genes for the enzyme monoamine-oxidase A, which metabolizes monoamine

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neurotransmitters, is involved in regulating aggression [19].

Individual variations in the binding of the serotonin 1A receptor have been linked to violence throughout one's life [20]. A functional HTR1A single nucleotide polymorphism (SNP, rs6295) was associated with both BIS-11 and Eysenck Personality Inventory (EPQ) scores in a population sample [21]. Numerous pharmacological investigations using agonists and antagonists of serotonin 2A, 2B, and 2C have demonstrated the involvement of these receptors in impulsive behavior. [22].

Serotonin-transporter-related promoter region, or 5-HTTLPR, is situated on chromosome 17q11.1–q12, upstream of the serotonin transporter gene (SLC6A4) and has a common polymorphism. The neurotransmitter serotonin is transported from the synaptic region to presynaptic neurons by an essential membrane protein that is encoded by this gene. An allele (S) with 14 repeats reduces transcriptional efficiency compared to the allele (L) with 16 repeats or the L allele containing a G substitution [23]. Stress-modified associations between this polymorphism and suicidality have also been reported, and HTTLPR has been associated with trait impulsivity as measured by BIS-11 [24-25].

Dopamine controls reward response, cognitive function, and attention—all of which are components of impulsivity. The nucleus acumens are located on the border of the corpus striatum and is present in both hemispheres of the brain. This nucleus is characterized by the presence of many dopamine receptors that play an important role in the functioning of various cognitive processes. In rats, spontaneous impulsivity is predicted by lower levels of dopamine D2 receptors in the nucleus acumens [26]. It has been demonstrated that variations in the dopamine transporter gene reduce the likelihood of ADHD, a condition marked by impulsivity and hyperactivity. Additionally, there is proof that variations in the dopamine D4 receptor gene are linked to an increased risk of ADHD [27].

An endophenotype approach to gene discovery can be employed to identify impulsivity, an inherited trait related with disease. But as was previously mentioned, impulsivity is not a monolithic concept, and several methods and metrics are employed to evaluate its various facets. Furthermore, it is accurate that no gene can be classified as "impulsivity gene" because most genes have pleiotropic effects, meaning they affect multiple phenotypic traits.

Current study has shown that variations in the structure and function of people's brains are related to impulsivity. People also differ in their capacity to restrain their impulses. A person's brain and nerves are involved in the flow of tasks when they feel, know, believe, recall, are conscious of reasons, designs, wills, or exercise determination. However, these studies of psychiatric genetics and neuroscience do not conclude that they can inform us as to whether defendants' acts were ethically or legally justified. Responsibility, though informed by empirical knowledge, is a normative standard. However, research indicates that certain individuals may find it nearly impossible to stop their behavior, even when they are aware that it is bad, in particular circumstances. Given this situation, it raises the question of how fair or effective it is to punish such people.

Crime and OCD

Crime is behavior that creates legal harm, undermines personal or social security, disrupts public order and has consequences that may hinder the development of societies and must be punished. The phenomenon of crime should be approached at an individual level as well as a legal event. The relationship between crime and mental disorders has attracted the attention of researchers and scientists working in this field, and many studies have been conducted on this subject. Based on the idea that people with serious mental illnesses may engage in violent behaviors, studies have found that physical violent behaviors is also associated with psychiatric disorders.

If mental illnesses and psychiatric disorders that reduce and/or eliminate a person's ability to control their behaviors and therefore their ability to commit crimes are experienced at the time of the crime, the criminal liability of the person is reduced or eliminated. A person who cannot perceive the legal meaning and consequences of the act he committed due to mental illness and whose ability to direct his behaviors in relation to this act is significantly reduced is not punished, but security measures are imposed on these people.

The relationship between mental illness and crime is a situation that needs to be seriously investigated and preventive initiatives should be taken due to the social, economic, and medical problems it causes. Studies have been curiously examined which mental disorders are related to the type of crime. It is claimed that with the increase in violent behaviors in society, violent behaviors in psychiatric cases are also increasing. Many studies have been conducted on the frequency of aggressive behaviors in people with psychiatric disorders. All studies on the subject show that schizophrenia, alcohol and/or substance addiction, antisocial personality disorder and obsessive-compulsive disorder are associated with a high criminal history.

If we consider OCD from the perspective of crime and forensic science, it includes obsessions that the diagnosed person may harm himself or someone else, intentionally, or unintentionally, in a community or social environment, may say humiliating, obscene or offensive words, and may engage in aggressive, disproportionate actions. OCD sufferers can occasionally act violently and criminally. There might be several causes. One is due to the distress experienced when someone else unintentionally or purposely tries to stop an obsession or is thought to be breaking the law without cause. To prevent the possibility of these behaviors from occurring, the person may show compulsions such as restricting behavior towards himself and his environment, and constantly apologizing even if the action does not occur. Furthermore, when an OCD sufferer believes that someone else has been harmed, they may become furious and upset and may even resort to improper physical force

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to defend the individual, which could lead to charges of violent crimes. There is a dearth of research on the legal implications of OCD, specifically on their significance for determining criminal guilt as well as criminal accountability [1,6].

Examining the typical effects of mental illnesses is necessary, particularly when making decisions that outline the legal environment during the sentencing phase of criminal proceedings. Thanks to a few sample cases in courts in the UK, Ireland, Canada, Australia, New Zealand, and India, it is hoped to increase awareness of OCD and OCPD globally [1].

Conflict of interests

The authors declare that there is no conflict of interest in the study.

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Ethical Approval

That review with no research intervention do not need ethics committee approval

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