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Original Article

Psychiatric Disorders Are Associated with an Increased Risk of Injuries: Data from the Iranian Mental Health Survey (IranMHS)

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Abstract

Background: Injuries and psychiatric disorders, notably both major public health concerns, are associated with a high burden and are believed to be bi-directionally correlated. Those inflicted with injuries face increased risks of mental illnesses. Psychiatric disorders may make the individual prone to injuries. The objective of the study was to assess the correlation of mental disorders with non-fatal injuries.

Methods: A total of 7886 participants aged 15 to 64 yr were interviewed in a national household survey in 2011 in Iran. Composite International Diagnostic Interview (CIDI v2.1) was implemented to assess the prevalence of psychiatric disorders in the past twelve months. Injuries were assessed using Short Form Injury Questionnaire (SFIQ-7).

Results: Injury was reported in 35.9% and 22.8% of participants in the past twelve and past three months, respectively. Using multivariate logistic regression analysis, mental disorders were significantly associated with injuries in the past three months (OR=1.6, 95% CI:1.36-1.87), recurrent injuries (OR=1.7, 95% CI: 1.21-2.41) and road/traffic accidents (OR=2.4, 95% CI: 1.28-4.49).

Conclusion: Psychiatric disorders were found to be associated with an increased risk of injuries. Early detection and treatment of mental illnesses can contribute to injury prevention.

Keywords: Injury, Mental health, Composite international diagnostic interview, Iran

Introduction

Injuries are associated with approximately 10% of global mortality (1). The disability-adjusted life years (DALY) associated with injuries has inclined over the last two decades and is now among the top ten leading causes of disability (2). Likewise, psychiatric disorders, being a major public health concern, are associated with high disability rates (3). Notably, unipolar depressive disorder single-handedly causes the highest YLD and is projected to impose the highest DALY in 2030 (4). In Iran, injuries followed by mental disorders are associated with highest rates of disability and burden in both sexes and all age groups,

contributing to 28% and 16% of DALY, respectively (5).

Psychiatric disorders and traumatic injuries are bidirectionally correlated (6). Psychiatric complications of injuries, regardless of the mechanism of injury and the injured organ, have been extensively studied (7-9). These complications consist of anxiety disorders such as post-traumatic stress disorder (PTSD) (10), mood disorders such as major depressive disorder (MDD) (8, 9) and alcohol related disorders (11).

On the other hand, evidence shows that traumas do not randomly happen in people, but rather in those with a history of psychopathology and maladaptive coping mechanisms (12, 13). Similar finding has been observed in children and adolescents as well (14, 15). This has led to the paradigm shift from the traditional concept of injuries as accidental incidents to a preventable public health concern. Increased rates of injuries have been observed in those with a mental illness in several studies as well (12, 16-21). In a retrospective cohort, higher rates of prior mental health morbidity and service use have been found in the injured population (19). In addition, a higher incidence of traumatic brain injury (TBI) has been reported in psychiatric patients (22, 23). Several underlying mechanisms such as cognitive impairment, lack of concentration and daytime drowsiness due to psychotropic medications have been proposed (16).

Few studies have addressed the relationship of injuries with mental and behavioral disorders in general population. This is the first study assessing such association in a population-based national survey in Iran and to authors' knowledge, the first ever to implement a structured diagnostic tool to assess psychiatric disorders for this purpose.

Materials and Methods

Study Design and Sampling

The current study is a part of the Iranian National Mental Health Survey (IranMHS), a household survey conducted in 2011. A comprehensive description of the IranMHS study method is explained elsewhere (24, 25). Study sample consisted of Iranian citizens, 15-64 yr of age, selected through a three-stage cluster random sampling method. First, 1525 blocks were randomly selected from the national list of the blocks developed from the 2006 national census. The number of selected blocks in each province was proportional to population of the province. Then, six families were randomly selected from within the block. Finally, one family member, aged 15-64 was randomly selected using the Kish Grid table.

The research protocol was approved by the Ethics Committee of Tehran University of Medical Sciences in Iran. Informed consent was obtained from all participants before the interview and the data was analyzed anonymously.

Instruments

Demographic data, consisting of gender, age, marital status, education, employment and area of residence was gathered. Socio-economic status was assessed using the latest version of a questionnaire used in the health service utilization study in 2005 (26).

In order to assess psychiatric disorders in the past 12 months, Composite International Diagnostic Interview version 2.1 (CIDI 2.1) was utilized. The Farsi version of CIDI had been validated before (27). Traumas and injuries were assessed using Short Form Injury Questionnaire (SFIQ-7), previously shown good reliability (28). Injuries were defined as any kind of trauma, laceration or harm to the tissues that required treatment, whether as simple as a plastering tape or as serious as those which required further medical attention in a treatment facility. SFIQ-7 asks participants about injuries in the past twelve and three months and then inquires the activity, place, mechanism, nature, body part, treatment setting and the treatment required for each injury during the past three months.

Field Work

A total of 232 trained interviewers who were all psychologists, with a minimum bachelor degree and some clinical expertise conducted face to

face interviews in the participant's home. Quality control was ensured using a hierarchy of supervising officers in two levels: survey secretariat and the field of study.

Data Entry

Data entry was fulfilled using the PASW 18 software (SPSS Inc., Chicago, IL, 2010) and then checked for inconsistencies and errors. Narrative data, acquired by the SFIQ were coded using the short form of International Classification of Diseases, 10th Revision (ICD-10) coding of injuries for type and mechanism of injuries. Those who reported having more than a single injury in the past three months, were regarded as having recurrent injuries (as opposed to single injury) (12) and those who required medical attention in a clinical setting were regarded as having a major injury (as opposed to minor injuries) (29).

Weighting and Statistical Analysis

For each of the 7886 participants, a weight has been attributed. The weighting process consisted of inverse probability of unit selection, non-response and post-stratification weights (25). Statistical analysis was performed by the STATA 8.0 SE software.

Table 1: Demographic characteristics of the injured population during last 3 months (N=7838)

Demographics		Injured during L3M[a]	
	n	Unweighted %	Weighted % (95% CI)[b]
Sex			
Male (n=3366)	691	20.5	22.5 (20.7-24.4)
Female (n=4472)	966	21.6	23.0 (21.3-24.6)
Age			
15-19 (n=997)	267	26.8	29.8 (26.4-33.2)
20-29 (n=2541)	629	24.8	26.0 (23.9-28.1)
30-39 (n=2183)	418	19.1	19.8 (17.7-21.9)
40-49 (n=1174)	203	17.3	17.0 (14.3-19.7)
50-59 (n=697)	109	15.6	14.9 (11.6-18.2)
60-64 (n=246)	31	12.6	15.1 (9.2-20.9)
Marital Status			
Single (n=2021)	490	24.2	26.2 (23.8-28.6)
Married (n=5487)	1104	20.1	21.1 (19.6-22.5)
Previously Married (n=328)	63	19.2	20.7 (15.1-26.3)
Education			
Illiterate (n=639)	84	13.1	12.9 (9.7-16.1)
Primary school (n=1901)	336	17.7	18.2 (16.0-20.4)
Middle school (n=1268)	278	21.9	23.8 (21.0-26.6)
High school (n=2816)	683	24.3	26.2 (24.1-28.3)
College/University (n=1202)	275	22.9	22.4 (19.5-25.3)
Residence			
Urban (n=4351)	1018	23.4	24.7 (23.0-26.4)
Rural (n=3487)	639	18.3	18.0 (16.1-19.8)
Employment			
Employed (n=2790)	601	21.5	23.0 (21.0-25.0)
Student (n=937)	242	25.8	27.9 (24.5-31.4)
Retired (n=165)	20	12.1	10.6 (5.6-15.6)
Homemaker (n=3219)	663	20.6	21.3 (19.4-23.2)
Unemployed (n=726)	131	18.0	20.7 (17.1-24.3)
Socio-economic Status			
Low (n=2152)	396	18.4	19.8 (17.4-22.1)
Middle (n=3191)	674	21.1	22.3 (20.5-24.0)
High (n=2330)	552	23.7	25.2 (22.9-27.5)

[a] L3M: Last three months/ [b] CI: Confidence Interval

Adjusted odds ratio and logistic regression with corresponding 95% confidence interval was applied to examine correlates of major and recurrent injuries and road/traffic accidents, including demographic variables, presence of a psychiatric or substance use disorder and taking psychotropic medications.

Results

Bivariate Analysis

From a total number of 9150 randomly selected eligible individuals, 7886 (3366 male and 4472 female participants) completed the interview.

Total response rate was 86.2%. The highest proportion of the study population was seen in the 20-29 age groups. Out of the 7886 respondents, most were married, had high school education and resided in urban areas. High prevalence of psychiatric disorders (23.6%) was seen in the population. A total of 2637 participants (35.9%) mentioned history of having an injury in the past twelve months and 1657 (22.8%) had such history in the past three months. Among participants, 280 (4.1%), 247 (3.4%) and 74 (1.2%) reported having major, recurrent and road traffic injuries in the past three months, respectively.

Table 1 summarizes the socio-demographic characteristics of the injured population during the last three months. Higher incidence of injury was seen in the younger age group, singles, more educated individuals and urban residents.

Of those who had a history of psychiatric disorder in the past twelve months, 45.3% also mentioned history of injury during the same period. Thus, presence of a psychiatric disorder, consisting of mood, anxiety and psychotic disorders, as well as alcohol and substance use disorders, imposed a 1.67 times (CI: 1.47-1.91) greater risk of injury in the past twelve months. Table 2 demonstrates the incidence of injuries in the past three months and prevalence of major and recurrent injuries across different psychiatric diagnoses. In bivariate analysis, presence of a mood disorder, anxiety disorder, psychotic disorders or alcohol use disorder was associated with 1.47 (CI: 1.24-1.75), 1.67 (CI: 1.40-1.98), 3.42 (CI: 1.51-7.72) and 2.06 (CI: 1.06-4.02) greater risk of injuries in the past three months, respectively. Substance use disorder (mainly consisting of opioids, amphetamine-type stimulants and cannabis use disorders) did not increase the risk of injuries in the past three months (OR=0.90, CI: 0.57-1.41).

Table 2: Prevalence of injury in the last three months across different psychiatric disorders

Psychiatric Disorders	Injured during L3M[a]		Major injury in L3M		Recurrent injury in L3M	
	n	Weighted %	n	Weighted%	N	Weighted%
Any mood disorder						
Positive (n=1150)	334	29.0	56	5.3	65	5.2
Negative (n=6643)	1311	21.7	274	3.9	181	3.1
Any anxiety disorder						
Positive (n=1201)	360	30.7	56	4.7	65	5.6
Negative (n=6159)	1179	21.0	209	4.0	161	3.0
Any psychotic disorder						
Positive (n=32)	14	50	3	8.3	4	14.9
Negative (n=7806)	1643	22.6	284	4.1	243	3.4
Any alcohol use disorder						
Positive (n=50)	16	37.6	6	15.8	4	11.8
Negative (n=7787)	1640	22.6	274	4.0	243	3.4
Any substance use disorder[b]						
Positive (n=151)	33	21.0	14	8.5	5	3.6
Negative (n=7687)	1624	22.8	266	4.0	242	3.4

[a] L3M: Last three months // [b] Substances mainly consisted of opioids, amphetamine-type stimulants and cannabis

Table 3 demonstrates the incidence of injury during the last three months according to the pattern of alcohol use in the past 12 months. As observed in the table, most of the patterns of alcohol use are associated with an increase in the injury rates. History of any alcohol consumption, consumption of more than 12 drinks, more than four consecutive drinks, and alcohol use disorders (consisting of alcohol abuse and alcohol dependence) in the past year are significantly correlated with injuries.

Multivariate Analyses

In order to eliminate the role of potential confounding factors, multivariate regression analysis was also performed.

Table 3: Pattern of alcohol consumption and incidence of injury

Alcohol use categories	Injured during L3M[a]		
	n	Weighted %	Odds Ratio (95% CI)[b]
More than 12 drinks in L12M[c]			
Positive (n=128)	43	38.0	2.12 (1.41-3.20)
Negative (n=7709)	1613	22.4	
Usual drinking of more than 4 drinks in a row			
Positive (n=67)	24	37.7	2.08 (1.23-3.52)
Negative (n=7771)	1633	22.6	
More than 4 drinks in last wk			
Positive (n=16)	5	35.4	1.87 (0.59-5.89)
Negative (n=7822)	1652	22.7	
Harmful use (as defined by ICD-10)			
Positive (n=34)	11	30.1	1.46 (0.65-3.28)
Negative (n=7803)	1646	22.7	
Alcohol abuse (as defined by DSM-IV)			
Positive (n=15)	5	36.9	2.0 (0.59-6.82)
Negative (n=7807)	1644	22.6	
Alcohol dependence (as defined by DSM-IV)			
Positive (n=35)	11	38.0	2.09 (0.94-4.63)
Negative (n=7802)	1645	22.6	
Alcohol abuse/dependence (as defined by DSM-IV)			
Positive (n=50)	16	37.6	2.06 (1.06-4.02)
Negative (n=7787)	1640	22.6	
Daily alcohol use in L12M			
Positive (n=16)	6	45.5	2.84 (0.98-8.21)
Negative (n=7822)	1651	22.7	

[a] L3M: Last three months
[b] CI: Confidence Interval
[c] L12M: Last twelve months

Variables consisting of sex, age, marital status, level of education, place of residence, employment, socio-economic status, psychiatric disorders, alcohol and substance use disorders and current medication use were analyzed.

Table 4 summarizes the bivariate and multivariate analyses of factors correlating with injuries in the past three months. Lower age, employment and urban residence were significantly associated with injuries. Mental illnesses (consisting of mood, anxiety and psychotic disorders) were associated with 1.59 times (CI: 1.36-1.87) greater risk of injuries in the past three months.

Table 4: Bivariate and multivariate analysis of factors correlated to injury in the last three months (n=1657)

Variables	Injured during L3M[a]					
	Number	Weighted %	Crude Odds Ratio (95% CI)	*P* Value	Adjusted Odds Ratio (95% CI)	*P* Value
Sex						
Male (n=3366)	691	22.5	1	0.712	1	0.584
Female (n=4472)	966	23.0	1.02 (0.90-1.17)		1.06 (0.87-1.28)	
Age						
15-19 (n=997)	267	29.8	1	-	1	-
20-29 (n=2541)	629	26.0	0.83 (0.69-1.00)	0.050	0.78 (0.61-1.00)	0.050
30-39 (n=2183)	418	19.8	0.58 (0.48-0.71)	<0.001	0.51 (0.38-0.68)	<0.001
40-49 (n=1174)	203	17.0	0.48 (0.38-0.61)	<0.001	0.42 (0.30-0.59)	<0.001
50-59 (n=697)	109	14.9	0.41 (0.30-0.56)	<0.001	0.41 (0.27-0.61)	<0.001
60-64 (n=246)	31	15.1	0.42 (0.26-.68)	<0.001	0.45 (0.26-0.80)	0.007
Marital Status						
Single (n=2021)	490	26.2	1	-	1	-
Married (n=5487)	1104	21.1	0.75 (0.62-0.87)	<0.001	1.15 (0.93-1.42)	0.186
Previously Married (n=328)	63	20.7	0.73 (0.51-1.05)	0.087	1.32 (0.88-2.00)	0.183
Education						
Illiterate (n=639)	84	12.9	1	-	1	-
Primary school (n=1901)	336	18.2	1.50 (1.10-2.05)	0.010	1.17 (0.84-1.62)	0.357
Middle school (n=1268)	278	23.8	2.11 (1.53-2.91)	<0.001	1.36 (0.95-1.96)	0.097
High school (n=2816)	683	26.2	2.40 (1.78-3.23)	<0.001	1.32 (0.93-1.88)	0.124
College/University (n=1202)	275	22.4	1.95 (1.41-2.71)	<0.001	1.09 (0.73-1.62)	0.664
Residence						
Urban (n=4351)	1018	24.7	1	<0.001	1	<0.001
Rural (n=3487)	639	18.0	0.67 (0.57-0.78)		0.68 (0.57-0.81)	
Employment						
Employed (n=2790)	601	23.0	1	-	1	-
Student (n=937)	242	27.9	1.30 (1.07-1.58)	0.009	0.87 (0.66-1.14)	0.316
Retired (n=165)	20	10.6	0.40 (0.23-0.68)	0.001	0.47 (0.27-0.82)	0.008
Homemaker (n=3219)	663	21.3	0.91 (0.78-1.05)	0.197	0.86 (0.69-1.07)	0.186
Unemployed (n=726)	131	20.7	0.87 (0.69-1.12)	0.281	0.80 (0.62-1.04)	0.095
Socio-economic Status						
Low (n=2152)	396	19.8	1	-	1	-
Middle (n=3191)	674	22.3	1.17 (0.98-1.38)	0.080	1.05 (0.87-1.26)	0.636
High (n=2330)	552	25.2	1.37 (1.13-1.65)	0.001	1.19 (0.96-1.49)	0.110
Any mood, anxiety or psychotic disorder						
Positive (n=1779)	512	29.1	1.56 (1.34-1.80)	<0.001	1.59 (1.36-1.87)	<0.001
Negative (n=6059)	1145	21.0	1		1	
Any alcohol use disorder						
Positive (n=50)	16	37.6	2.06 (1.06-4.02)	0.034	1.50 (0.74-3.06)	0.265
Negative (n=7790)	1640	22.6	1		1	
Any substance use disorder						
Positive (n=151)	33	21.0	0.79 (0.53-1.16)	0.235	0.83 (0.50-1.37)	0.469
Negative (n=7690)	1624	22.8	1		1	
Current psychiatric medication use						
Positive (n=416)	84	18.9	0.78 (0.58-1.06)	0.108	0.82 (0.59-1.13)	0.229
Negative (n=7422)	1573	22.9	1		1	

[a] L3M: Last three months

Table 5 and 6 show multivariate analyses for major and recurrent injuries, respectively. Major injuries (n=280) were significantly less prevalent in women, 40-49 age group and those residing in rural areas. Considering the marital status, the previously married group had an increased risk of major injuries. Major injuries were more prevalent in those with a psychiatric disorder (OR=1.28), alcohol use disorders (OR=2.35) and substance use disorders (OR=1.15). However, this observation did not prove statistically significant. Recurrent injuries (n=247) were significantly higher in

the 15-19 age group and those who dwell in the cities. Having a history of a mental disorder was associated with 1.71 (CI: 1.21-2.41) times increase in the probability of recurrent injuries.

Table 5: Bivariate and multivariate analysis of correlated factors of major injury in the last three months (n=280)

Variables	Major injury during L3M[a]					
	Number	Weighted %	Crude Odds Ratio (95% CI)	*P* Value	Adjusted Odds Ratio (95% CI)	*P* Value
Sex						
Male (n=3366)	193	6.1	1	<0.001	1	<0.001
Female (n=4472)	87	2.1	0.34 (0.25-0.45)		0.34 (0.22-0.51)	
Age						
15-19 (n=997)	36	4.0	1	-	1	-
20-29 (n=2541)	108	4.8	1.21 (0.78-1.88)	0.404	1.01 (0.59-1.72)	0.975
30-39 (n=2183)	73	4.2	1.05 (0.66-1.67)	0.828	0.77 (0.41-1.45)	0.414
40-49 (n=1174)	33	2.6	0.63 (0.36-1.11)	0.110	0.46 (0.22-0.98)	0.043
50-59 (n=697)	25	4.1	1.03 (0.57-1.86)	0.933	0.73 (0.32-1.64)	0.442
60-64 (n=246)	5	3.4	0.84 (0.27-2.62)	0.762	0.53 (0.14-2.05)	0.361
Marital Status						
Single (n=2021)	88	4.6	1	-	1	-
Married (n=5487)	177	3.7	0.79 (0.58-1.07)	0.132	1.03 (0.66-1.58)	0.908
Previously Married (n=328)	15	7.2	1.38 (0.73-2.63)	0.324	2.73 (1.37-5.48)	0.004
Education						
Illiterate (n=639)	16	3.0	1	-	1	-
Primary school (n=1901)	58	3.6	1.21 (0.64-2.31)	0.555	0.83 (0.42-1.62)	0.577
Middle school (n=1268)	51	5.3	1.82 (0.95-3.47)	0.071	1.00 (0.48-2.09)	0.997
High school (n=2816)	110	4.3	1.46 (0.80-2.66)	0.215	0.81 (0.39-1.67)	0.573
College/University (n=1202)	45	3.5	1.18 (0.61-2.28)	0.633	0.68 (0.30-1.55)	0.358
Residence						
Urban (n=4351)	171	4.4	1	0.045	1	0.038
Rural (n=3487)	109	3.3	0.74 (0.54-0.99)		0.70 (0.50-0.98)	
Employment						
Employed (n=2790)	152	5.8	1	-	1	-
Student (n=937)	32	3.4	0.56 (0.35-0.90)	0.015	0.65 (0.37-1.14)	0.135
Retired (n=165)	8	3.7	0.62 (0.28-1.36)	0.230	0.88 (0.33-2.37)	0.805
Homemaker (n=3219)	58	2.2	0.37 (0.26-0.52)	<0.001	0.92 (0.55-1.53)	0.740
Unemployed (n=726)	30	5.0	0.86 (0.54-1.36)	0.511	0.92 (0.59-1.45)	0.724
Socio-economic Status						
Low (n=2152)	65	3.8	1	-	1	-
Middle (n=3191)	127	4.5	1.19 (0.83-1.71)	0.339	1.14 (0.77-1.67)	0.512
High (n=2330)	82	3.9	1.02 (0.68-1.53)	0.924	1.01 (0.64-1.58)	0.973
Any mood, anxiety or psychotic disorder						
Positive (n=1779)	81	4.8	1.24 (0.91-1.69)	0.173	1.28 (0.91-1.79)	0.157
Negative (n=6059)	199	3.9	1		1	
Any alcohol use disorder						
Positive (n=50)	6	15.8	4.50 (1.80-11.23)	0.001	2.35 (0.84-6.58)	0.103
Negative (n=7790)	274	4.0	1		1	
Any substance use disorder						
Positive (n=151)	14	8.5	2.21 (1.18-4.12)	0.013	1.15 (0.56-2.39)	0.699
Negative (n=7690)	266	4.0	1		1	
Current psychiatric medication use						
Positive (n=415)	16	3.8	0.93 (0.51-1.68)	0.806	1.15 (0.60-2.18)	0.673
Negative (n=7407)	264	4.1	1		1	

[a] L3M: Last three months

Table 6: Bivariate and multivariate analysis of factors correlated with recurrent injury in the last three months (n=247)

Variables			Recurrent injury during L3M[a]			
	Number	Weighted %	Crude Odds Ratio (95% CI)	*P* Value	Adjusted Odds Ratio (95% CI)	*P* Value
Sex						
Male (n=3366)	93	3.0	1	0.130	1	0.514
Female (n=4472)	154	3.8	1.27 (0.93-1.72)		1.16 (0.75-1.78)	
Age						
15-19 (n=997)	34	3.6	1	-	1	-
20-29 (n=2541)	113	4.8	1.33 (0.86-2.07)	0.202	0.99 (0.58-1.72)	0.993
30-39 (n=2183)	55	2.9	0.78 (0.49-1.25)	0.310	0.50 (0.27-0.93)	0.028
40-49 (n=1174)	29	2.4	0.65 (0.37-1.14)	0.132	0.42 (0.21-0.84)	0.015
50-59 (n=697)	15	1.9	0.51 (0.26-1.01)	0.055	0.34 (0.14-0.82)	0.016
60-64 (n=246)	1	0.2	0.06 (0.01-0.42)	0.005	0.04 (0.004-0.32)	0.003
Marital Status						
Single (n=2021)	65	3.5	1	-	1	-
Married (n=5487)	173	3.5	1.00 (0.72-1.39)	0.998	1.37 (0.90-2.09)	0.136
Previously Married (n=328)	9	2.7	0.75 (0.35-1.60)	0.455	1.39 (0.62-3.12)	0.426
Education						
Illiterate (n=639)	12	2.0	1	-	1	-
Primary school (n=1901)	40	2.2	1.09 (0.53-2.23)	0.821	0.68 (0.32-1.48)	0.333
Middle school (n=1268)	48	4.1	2.06 (1.05-4.05)	0.036	1.04 (0.51-2.15)	0.908
High school (n=2816)	103	3.8	1.94 (0.99-3.78)	0.053	0.86 (0.41-1.83)	0.695
College/University (n=1202)	44	3.8	1.89 (0.93-3.84)	0.080	0.84 (0.37-1.93)	0.686
Residence						
Urban (n=4351)	176	4.1	1	<0.001	1	<0.001
Rural (n=3487)	71	1.9	0.45 (0.32-0.63)		0.43 (0.29-0.64)	
Employment						
Employed (n=2790)	85	3.4	1	-	1	-
Student (n=937)	29	3.5	1.03 (0.64-1.67)	0.904	0.78 (0.43-1.44)	0.430
Retired (n=165)	2	1.3	0.38 (0.09-1.59)	0.186	0.79 (0.17-3.70)	0.762
Homemaker (n=3219)	115	3.9	1.15 (0.82-1.62)	0.420	0.99 (0.62-1.61)	0.993
Unemployed (n=726)	16	2.3	0.67 (0.38-1.19)	0.173	0.58 (0.31-1.09)	0.090
Socio-economic Status						
Low (n=2152)	59	2.9	1	-	1	-
Middle (n=3191)	99	3.5	1.24 (0.85-1.80)	0.268	0.97 (0.65-1.45)	0.887
High (n=2330)	85	3.7	1.31 (0.90-1.91)	0.163	0.98 (0.62-1.54)	0.924
Any mood, anxiety or psychotic disorder						
Positive (n=1779)	94	5.0	1.73 (1.26-2.38)	0.001	1.71 (1.21-2.41)	0.002
Negative (n=6059)	153	3.0	1		1	
Any alcohol use disorder						
Positive (n=50)	4	11.8	3.87 (1.31-11.44)	0.014	2.91 (0.82-10.28)	0.097
Negative (n=7790)	243	3.4	1		1	
Any substance use disorder						
Positive (n=151)	5	3.6	1.04 (0.42-2.60)	0.935	0.87 (0.29-2.63)	0.807
Negative (n=7690)	242	3.4	1		1	
Current psychiatric medication use						
Positive (n=416)	8	2.2	0.62 (0.29-1.35)	0.229	0.66 (0.30-1.44)	0.297
Negative (n=7425)	239	3.5	1		1	

[a] L3M: Last three months

Table 7 demonstrates multivariate analyses of factors related to road traffic accidents. Road traffic accidents (n=74) were significantly more prevalent in men (OR=5.55, CI: 2.08-14.28) and those who had a psychiatric disorder (OR=2.37, CI: 1.28-4.49). Alcohol and substance use disorders were also associated with higher rates of road traffic accidents; then again this finding was not statistically significant.

Table 7: Bivariate and multivariate analysis of factors of traffic accidents in last three months (n=74)

Variables	Road Traffic accidents during L3M[a]					
	Number	Weighted %	Crude Odds Ratio (95% CI)	*P* Value	Adjusted Odds Ratio (95% CI)	*P* Value
Sex						
Male (n=3366)	63	2.1	1	<0.001	1	0.001
Female (n=4472)	11	0.3	0.12 (0.06-0.25)		0.18 (0.07-0.48)	
Age						
15-19 (n=997)	19	2.4	1	-	1	-
20-29 (n=2541)	31	1.4	0.57 (0.30-1.09)	0.088	0.52 (0.19-1.44)	0.208
30-39 (n=2183)	13	0.5	0.21 (0.10-0.45)	<0.001	0.21 (0.06-0.71)	0.012
40-49 (n=1174)	6	0.6	0.22 (0.07-0.68)	0.009	0.21 (0.05-0.99)	0.049
50-59 (n=697)	4	0.9	0.36 (0.09-1.34)	0.128	0.34 (0.05-2.20)	0.257
60-64 (n=246)	1	0.4	0.14 (0.02-1.08)	0.059	0.13 (0.01-1.22)	0.074
Marital Status						
Single (n=2021)	37	2.3	1	-	1	-
Married (n=5487)	35	0.6	0.28 (0.16-0.48)	<0.001	0.63 (0.32-1.25)	0.184
Previously Married (n=328)	2	0.9	0.39 (0.09-1.75)	0.220	1.43 (0.28-7.40)	0.667
Education						
Illiterate & Primary school (n=2540)	18	0.9	1	-	1	-
Middle school (n=1267)	18	2.4	2.58 (1.20-5.56)	0.016	1.28 (0.48-3.43)	0.620
High school (n=2815)	27	1.1	1.21 (0.60-2.47)	0.595	0.44 (0.18-1.07)	0.069
College/University (n=1200)	11	0.8	0.81 (0.33-1.94)	0.629	0.39 (0.13-1.21)	0.103
Residence						
Urban (n=4351)	43	1.2	1	0.907	1	0.587
Rural (n=3487)	31	1.2	1.03 (0.60-1.77)		0.83 (0.43-1.61)	
Employment						
Employed (n=2790)	40	1.5	1	-	1	-
Student (n=937)	13	1.7	1.10 (0.52-2.30)	0.808	0.87 (0.31-2.50)	0.801
Retired (n=165)	2	0.6	0.41 (0.09-1.77)	0.230	0.96 (0.16-5.78)	0.960
Homemaker (n=3219)	4	0.1	0.08 (0.02-0.24)	<0.001	0.35 (0.08-1.49)	0.155
Unemployed (n=726)	15	3.0	2.00 (0.98-4.04)	0.056	1.64 (0.78-3.45)	0.196
Socio-economic Status						
Low (n=2152)	19	1.4	1	-	1	-
Middle (n=3191)	31	1.2	0.91 (0.46-1.80)	0.790	1.12 (0.55-2.28)	0.754
High (n=2330)	23	1.1	0.78 (0.37-1.62)	0.499	1.11 (0.50-2.49)	0.790
Any psychiatric disorder**						
Positive (n=1779)	28	2.1	2.26 (1.29-3.94)	0.004	2.37 (1.28-4.49)	0.006
Negative (n=6059)	46	0.9	1		1	
Any alcohol use disorder						
Positive (n=50)	2	5.4	4.87 (1.13-20.93)	0.033	1.47 (0.30-7.16)	0.632
Negative (n=7790)	72	1.2	1		1	
Any substance use disorder						
Positive (n=151)	8	4.2	3.78 (1.64-8.69)	0.002	1.46 (0.54-3.95)	0.461
Negative (n=7690)	66	1.1	1		1	
Current psychiatric medication use						
Positive (n=416)	4	1.3	1.10 (0.32-3.77)	0.885	1.29 (0.37-4.50)	0.685
Negative (n=7418)	70	1.2	1		1	

[a] L3M: Last three months

Discussion

This study was carried out to assess the association of mental disorders with non-fatal injuries. Overall, psychiatric disorders were associated with a 1.6 greater risk of injuries. This finding was statistically significant after the omission of potential confounding factors in the multivariate regression analysis. We also found that psychiatric disorders were associated with higher risk for recurrent injuries and road traffic accidents. This finding was independent of the role of alcohol and substance use disorders.

Higher odds ratios for traumatic injuries in the mentally ill have been reported in the previous studies, both in general population (18, 19) and specific trauma patients such as traumatic brain injuries (22, 23). Fann and colleagues reported a 1.6 times greater risk of traumatic brain injuries in those who had a combination of psychiatric diagnosis, psychotropic medication and mental health service use during the past year (23). Odds ratios ranging from 1.6-2.5 for traumatic brain injuries across different psychiatric disorders have been reported (22). Chen and colleagues reported higher rates of injuries in those with personality disorders (30). High levels of depressive symptoms were associated with increased rates of injuries, especially in women (31). Similarly, major depressive episodes were associated with an adjusted hazard ratio of 1.6 for injuries (17). Considering the high prevalence of both psychiatric disorders (23.6%) and injuries (35.9% and 22.8% for the past twelve and three months, respectively), detected in the survey, one can highlight the importance of these major public health issues. Thus, treatment of psychiatric disorders can contribute to injury prevention and result in the reduction of its associated costs and disability rates.

In the current study, mental disorders, regardless of psychotropic medications, were associated with injuries. Similar finding has been observed in other studies as well, in which depressive symptoms, regardless of receiving medications, were associated with increased risk of injuries (16, 17). The role of psychoactive medications has been majorly attributed to falls in the elderly and accidents in the workplace (32, 33). As mentioned before, this study was part of a national household survey with participants aging from 15 to 64. Therefore, lack of association between medication use and injuries might be due to the fact that the geriatric population was not part of the study. Future studies with the inclusion of the elderly population are required in this regard.

Major injuries were significantly correlated with male sex and urban residence. Lack of significant correlation between psychiatric disorders and major injuries might be due to the fact that this study mainly focused on non-fatal injuries in a household survey. People suffering from severe mental illnesses might be more prone to fatal injuries and thus, have been excluded from this study. In future studies, assessment of medical records might help in the interpretation of this finding.

Alcohol use disorders were associated with increased rates of injuries. We also found that most of the patterns of alcohol consumption were associated with increased rates of injury. However, this did not prove statically significant after regression analysis. In this regard, one has to bear in mind the legal and cultural sanctions towards alcohol consumption in Iran. Moreover, this study was carried out through face-to-face interview and there is a high possibility of under-reporting. Most studies emphasize on the acute effects of alcohol use and traumatic injuries (31, 34-36). In the current study, more attention has been given on the patterns of alcohol use and psychiatric comorbidities of alcohol use disorders. In addition to that, it was found that alcohol use disorders were associated with highest odds ratios in bivariate analysis for the incidence of injuries, recurrent and major injuries. Thus, a study with a larger study population is needed to address the correlation. The observed correlation of alcohol use disorders with injuries in bivariate analyses emphasizes the need for screening of alcohol use disorders in trauma and accident-prone populations.

Substance use disorders were associated with major injuries and road traffic accidents. Yet again, this finding was not replicated in the multivariate regression analysis. Similar to alcohol use, pre-

vious studies mainly had focused on the acute and intoxication effects of substance use in injuries (37, 38). Lack of a strong correlation between substance use disorder and injuries in the current study, might be due to the associated stigma and legal consequences of substance use in Iran, which can lead to underreporting of substance use disorders. It is reminded that opium is the major substance of abuse in Iran. Opium use and opium use disorder are associated with lower health and social consequences comparing to other illicit opioids (39). Opium users lead a more sedentary lifestyle and therefore might not be as prone to injuries as others. However, higher rates of traffic accidents have also been reported among opioid addicts in Iranian studies (40, 41). These studies focused on opium use among applicants of driving license and interstate truck drivers. Further studies are required to elicit the role of substance use in injuries.

Strengths and Limitations

This study was a part of IranMHS and therefore had a large sample size. Moreover, assessment of injuries was not restricted to a specific type or mechanism of injury. As mentioned before, to authors' knowledge, this is the first study on injury implemented a structural diagnostic tool to evaluate psychiatric disorders. Relying exclusively on self-report in the assessment of injuries and lack of medical records in this regard can be counted as a study limitation. The cross-sectional design of the study should also be considered as another study limitation, because it does not allow one to interpret the observed associations as a causal, but merely a temporal relationship.

Conclusion

Psychiatric disorders in the past twelve months were associated increased risk of injuries, as well as recurrent injuries and road traffic accidents in the past three months. Thus, early detection and treatment of mental disorders, shown to be quite prevalent, might help in prevention of injuries. Authors suggest that prospective studies could further enrich our understanding of the impact of mental disorders upon unintentional non-fatal injuries. Similar study could be replicated for child, adolescents, and the elderly.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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The authors declare that there is no conflict of interests.

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