

Psychiatric Commission and Drivers with Personality Disorders: A Prospective Cohort Study

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Abstract

Introduction: This study investigated the impact of a psychiatry commission on individuals with psychiatric disorders prior to their driving license renewal.

Method: The current cohort study included 188 individuals seeking driving license renewal in 2017-19. Their prior traffic accidents and infringements were assessed. After renewal, any new traffic incidents were monitored. The gathered data entered into SPSS. P-value < 0.05 was considered significant.

Results: After the renewal, there was a significant reduction in the frequency of infringements per year (P-value<0.001). The incidence of traffic infringements (P-value<0.001) was remarkably reduced. The highest rates of infringements after license renewal included stopping or bypassing in prohibited places (48.3%), illegal speeding or overtaking (21.6%), and failure to observe the safety issues or traffic signs (12.5%), respectively. The types of accidents did not change (P-value=0.99). The incidence of hurt (P-value<0.001) and death (P-value=0.034) due to the accidents and the culprit of the accidents (P-value<0.001) significantly decreased.

Conclusion: Based on the findings, a psychiatry commission and shorter period of driving license renewal for individuals with psychiatric disorders or personality traits who have had a history of traffic infringements or accidents led to significantly less rates of traffic infringements and adverse events due to traffic incidents.

Keywords: Traffic Accidents, Psychiatry, Criminal Behavior, Automobile Driving

Introduction

Driving is one of the dynamic issues in all communities signifying mobility and productivity [1]. Nevertheless, road accidents and the related mass casualties are among the substantial challenges of the human societies associated with significant threats for the healthcare systems, imposes remarkable burden on the communities and is one of the critical causes of morbidity and mortality [2]. The degree of injuries and the frequency of major road accidents are to such extent that it is called the "war on the roads". The statistics have estimated that 10% of all road accidents result in approximately 3,000 deaths worldwide each day [3, 4]. The epidemiological studies have revealed that up to 67% of the traffic accidents occur in developing countries where owning only 11% of the vehicle fleet [5]. According to the statistics of the legal medicine organization issued, 16,872 deaths and 304,485 cases of injuries caused by traffic accidents have occurred in Iran [6]. Various factors affect the performance of driving in communities. The underlying causes of road accidents are complex and involve the interaction of a combination of factors that include road users, the vehicle, roadway, environment and the way they interact [7-10].

Moreover, the personality characteristics of the drivers should not be underestimated [11, 12].

Driving requires a combination of cognitive, sensorimotor, and psychosocial abilities. Factors known as 'cognitive-behavioral characteristics' influence how a driver acts and reacts on the road. Accordingly, both conscious and unconscious human factors known as "cognitive-behavioral characteristics" affect a driver's actions and reflections during driving [1]. Existing research suggests that driving errors are responsible for 93% of traffic accidents, 34% due to operational deficiencies, and 12% due to vehicle malfunctions [13].

Driver's personality is one of the critical factors underscored to influence the driving behaviors [14]. This is while personality disorders as one of the most common psychiatric disorders are long-lasting and can clinically affect all aspects of a person's life due to their impacts on cognition, affects, impulse control and interpersonal relationships [15-17]. According to the evidence, psychological characteristics such as empathy and stress level have a causing effect on the incidence of road accidents [18, 19]. Generally, human factors are categorized into two classifications of cognitive-behavioral and behavioral factors. Infringement of driving laws, driving at high speed while feeling dizzy and fatigued, drug or alcohol use are contributed as the behavioral factors, while the latter include personality traits (based on the big five personality traits), driving behavior, and mental disorders (based on the diagnostic interview)[13].

Surfing the literature shows the attentions of police services to the mental health of the drivers. For instance, Bowen et al. presented that personality disorders were associated with increased rate of risky behaviors during driving that can potentially lead to life-threatening traffic events [20]. In another study, Salman-Alavi et al. investigated the rule of psychiatric disorders in traffic accidents and found that the cases suffering from depression or anxiety were 2.5 folds at increased risk of developing road accidents [13]. Nevertheless, paucity of knowledge is available regarding the necessity of following the drivers with baseline personality or psychiatric disorders aiming at renewing their driving license. The current study aims to investigate the impact of a psychiatry commission prior to driving license renewal on the driving performance of individuals with personality disorders.

Method

The current cohort study has been conducted on 188 individuals with documented personality disorder referring for driving license renewal to the psychiatry commission to determine the period of renewal in Tehran. Individuals who apply for the renewal of their driving license, if during the initial medical examination are found to have signs of self-harm, tattoos, or symptoms of psychological issues, are referred to a psychiatric commission. This commission, comprising several psychologists and psychiatrists, conducts a more detailed clinical examination of the individual. They interview the

person and, if necessary, may also utilize various tests such as Electroencephalograms (EEGs) and others to reach a final diagnosis. The subjects were followed for a period of three years to determine the incidence or repetition of traffic accidents and infringements from January 2017 to December 2019.

This study has been primarily proposed to the Research Center of Trauma in Police Operations and as it met the ethical criteria was approved via code number IR.BMSU.REC.1401.024. The study protocol was explained to the individuals or their legal guardians, they were reassured regarding the confidentiality of their personal information and all participants signed a written consent for taking part in the study. After completing the legal procedures and obtaining the necessary permissions from the relevant authorities, this project was referred to the Imam Sajjad Hospital Medical Examination Center by the Traffic Police and the names and national IDs of the targeted individuals were extracted. It is noteworthy to mention that a significant number of the statistical population was excluded from this research for various reasons as the work progressed. In summary, in 2018, approximately 4.2 million people applied for a driving license, of which about 1,100 were considered as a homogenous statistical population (According to Figure 1). Ultimately, the extracted names were sent to the Traffic Police Information Technology department to extract the driving violation records of these individuals. The individuals who referred for driving license renewal and were suspected for psychiatric disorders or personality traits due to the signs of self-mutilation or any previous documented history of social conflicts were considered for inclusion in this study. Those with compatible inclusion criteria referred to a psychiatrist and if personality diagnosis was confirmed, they were included in the study.

New driving license course participants, driving as an occupation, the psychiatric commission diagnoses compatible with no pathology, inability to get a comprehensive driving history and failure to follow the drivers were defined as the exclusion criteria.

Figure 1 shows the studied population in this study who met the study criteria through convenience sampling until achieving the required number of subjects.

In the first step, the individuals' demographic characteristics including age, gender, and educational level were gathered. Then, by referral to the data of the Police Force of the Islamic Republic of Iran, the data of the baseline and follow-up investigations after driving license renewal due to the psychiatry commission decision were recruited.

The assessed data included the frequency (per year) and type (executive or accident) of traffic infringements, type of the vehicle (SUV or regular chassis), the vehicle producer (Iran, China and non-Chinese foreign cars), the season of the accidents, the area of the accidents (downtown or suburbs), the outcomes of the accident (damage, hurt and death) and the responsibility for the traffic events (culprit or non-culprit).

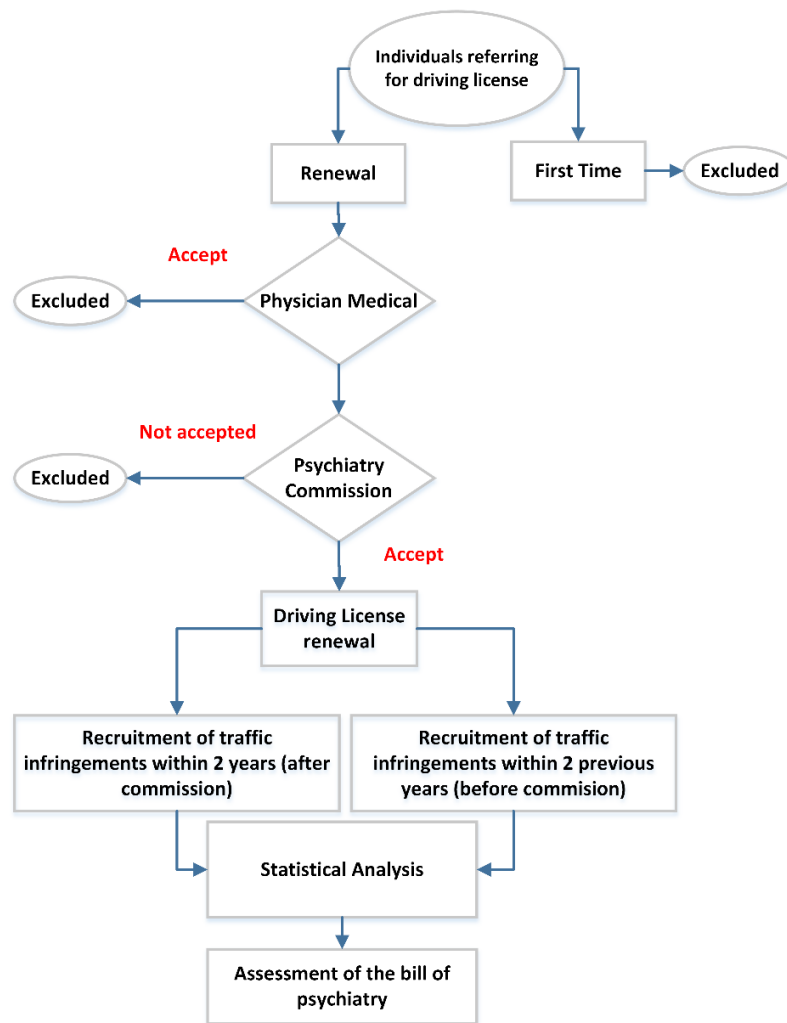


Figure 1. The process of study.

Further information referred to the frequency and type of the executive infringements including driving, stopping or bypassing in the prohibited places, illegal speeding or overtaking, not having the documents, disregarding police orders, failure to observe the safety issues or traffic signs and vehicle technical defect. All data were gathered at baseline (2015-16) and within three years after the license renewal (2018-19).

The obtained data were entered into the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 23. The qualitative data were presented as absolute numbers and percentages and the quantitative ones as mean and standard deviation. The normality of data distribution was assessed using the one-sample Smirnov-Kolmogorov test. Considering the abnormal

data distribution, the categorical data were compared using the Wicxon or McNemar tests. The continuous data were compared using independent T-test. P-value of less than 0.05 was determined as the level of significance.

Results

In the current study, data of 188 individuals who referred to the psychiatry commission for renewal of their driving license were evaluated. The study population predominantly consisted of males (90.4%) with the mean age of 34.29±6.78 years old. The majority of the studied population was in the age range of less than 30 years old and had Bachelor of Science educational level (52.1%). Detailed demographic characteristics have been presented in Table 1.

Table 1. Demographic Characteristics of Studied Population

Variables	Measurements
Gender, n (%)	Male 170 (90.4)
	Female 18 (9.6)
Age (year), mean ± standard deviation	34.29±6.78
Age range (year), n (%)	<30 66 (35.1)
	31-35 44 (23.4)
	36-40 38 (20.2)
	>40 40 (21.3)
Educational level, n (%)	Under diploma 41 (21.8)
	Diploma to Bachelor of Science 98 (52.1)

Master of Science and above

49 (26.1)

According to the scope of the study, the assessed subjects were evaluated regarding the trend of changes in the traffic infringements and accidents at baseline and after the renewal of the driving license. According to Table 2, despite a significant reduction in the frequency of infringements per year after the driving license renewal (P -value <0.05), the types of accidents did not change (P -value $=0.99$). Besides, the other factors including type of the vehicle, its producer, and time of the accidents (P -value >0.05) did not differ either. However, the outcomes

(P -value <0.05) and the responsibility of the accidents (P -value <0.001) were significantly different.

The major body of traffic infringements included driving, stopping or bypassing in the prohibited places, illegal speeding or overtaking and failure to observe the safety issues or traffic signs, respectively. Despite the significant decrease in the incidence of traffic infringements (P -value <0.001), mentioned faults remained the top list of the infringements after license renewal (Table 3).

Table 2. The Traffic Infringements and Accidents Changes in the Period of Study

		2016-17	2018-19	P
Educational level, n (%)				
Under diploma		41 (21.8)	39 (20.7)	0.083**
Diploma to Bachelor of Science		98 (52.1)	99 (52.7)	
Master of Science and above		49 (26.1)	50 (26.6)	
Frequency of infringements per year, mean \pm standard deviation				
Executive		4.88 \pm 9.13	2.28 \pm 5.07	$<0.001^*$
Accident		0.46 \pm 0.75	0.32 \pm 0.47	$<0.001^*$
Total		5.35 \pm 9	2.57 \pm 4.99	$<0.001^*$
Type of traffic infringements, n (%)				
Executive		124 (66)	99 (62.7)	0.99**
Accident		52 (28.7)	47 (29.7)	
Both		12 (6.3)	12 (7.6)	
Type of the vehicle, n (%)				
Normal chassis car		148 (78.7)	152 (80.9)	0.125 [#]
SUV		40 (21.3)	36 (19.1)	
Producer of the car, n (%)				
Iranian		133 (70.7)	136 (72.3)	0.180**
Chinese		43 (22.9)	40 (21.3)	
Foreigner other than Chinese		12 (6.4)	12 (6.4)	
Time of the traffic accidents, n (%)				
Spring	Yes	28 (43.8)	19 (29.7)	0.078 [#]
	No	36 (56.3)	45 (70.3)	
Summer	Yes	16 (25)	11 (17.2)	0.180 [#]
	No	48 (75)	53 (82.8)	
Autumn	Yes	25 (39.1)	18 (28.1)	0.092 [#]
	No	39 (60.9)	46 (71.9)	
Winter	Yes	18 (28.1)	12 (18.8)	0.180 [#]
	No	46 (71.9)	52 (81.3)	
Site of the traffic accidents, n (%)				
Downtown		40 (62.5)	37 (62.7)	0.999 [#]
Suburbs		24 (37.5)	22 (37.3)	
Frequency and outcomes of the traffic accidents, n (%)				
Damage	0	21 (32.8)	15 (23.4)	0.433**
	1	41 (64.1)	49 (76.6)	
	2	2 (3.1)	0 (0)	
Hurt	0	29 (45.3)	54 (84.4)	$<0.001^{**}$
	1	34 (53.1)	10 (15.6)	
	2	1 (1.6)	0 (0)	
Death	0	57 (89.1)	63 (94.8)	0.034 [#]
	1	7 (10.9)	1 (1.6)	
	2	0 (0)	0 (0)	
Responsibility in the accident, n (%)				
The culprit		42 (65.6)	13 (22)	$<0.001^{\#}$
Non-culprit		22 (34.4)	46 (78)	

*Independent t-test

**Wilcoxon test / [#] McNemar test

Table 3. The Frequency of Infringements

Variables	2016-17	2018-19
Driving, stopping or bypassing in the prohibited places, n (%)	429 (46.9)	212 (48.3)
Illegal speeding or overtaking, n (%)	198 (21.6)	95 (21.6)
Not having the documents, n (%)	72 (7.9)	29 (6.6)
Disregarding police orders, n (%)	58 (6.3)	29 (6.6)
Failure to observe the safety issues or traffic signs, n (%)	127 (13.9)	55 (12.5)
Vehicle technical defect, n (%)	31 (3.4)	19 (4.3)
Total, n (%)	915 (100)	439 (100)

Discussion

In the current study, we tried to investigate the efficacy of psychiatric commissions on those who have psychiatric disorders in order to assess the impact of limiting their driving license renewal period on their driving performance. Accordingly, we found this limitation as a successful means to reduce the frequency and outcome of the traffic accidents as well as the responsibility of the accidents. Besides, remarkable reduction in the incidence of traffic infringements was noted.

Vehicle driving is one of the inevitable facts of to date life; however, providing driving license to every individual is a matter of debate. It seems a right for everyone to have this license after passing the tests, while its provision to some of the personality traits remained challenging. This issue partly relates to the impact of the cognitive-behavioral state of the traffic behavioral performances as these people are prone to present inappropriate or antisocial actions [1].

One of the findings of our study revealed that the indicated subjects whose license renewal was questioned were predominantly in their twenties, a fact in agreement with the previous studies representing that the incidence of road accidents and driving infringements was higher in younger ages [13, 21, 22]. Heidari et al. reported that 18-25 years old individuals had the highest rate of driving violations [21].

The association of educational level with traffic accidents is a matter of debate; however, we found no association, while the assessed cases got more educated in the follow-up evaluations compared to the baseline. Generally, most of the studies in the literature present educational level as a contributing factor to lower risks of accidents or at least fatal accidents [23, 24]. Nevertheless, as most of the drivers working on heavy vehicles in Iran are more experienced and have fewer accidents, while the majority of fatal accidents occur in light vehicles, Sami et al. presented an inverse association [25] which seems to be contributed to the selected study population.

Generally, this study represented that psychiatric commissions for the careless drivers with psychiatric disorders in advance to the renewal of their driving license could successfully lead to improved driving associated behaviors. This improvement partly occurs due to their increased experience and also caution. Numerous studies in the literature have represented that getting more experienced leads to more appropriate manners and better reactions during driving [26, 27]. Other studies on the subjects with the history of car accident stated that the duration of a driver's license is more associated with

the reduced risk of accidents due to human factors; and more experience is associated with reduced accidents. Accordingly, in addition to the efficacy of psychiatric commissions, the matter of experience should not be underestimated [28, 29].

In confirmation, the major body of evidence has shown that the individuals suffering from mental illnesses are at 2-4 folds increased risks of traffic infringements and accidents as poor driving behaviors is in direct association with risk-taking driving [20]. Personality is another correlated factor with driving behaviors and risk-taking. Personality traits including extraversion, neuroticism, agreeableness, conscientiousness and openness have been described as the contributing factors in the incidence of traffic accidents [13, 30-33]. Accordingly, it has been recommended to identify the individuals with inappropriate personality trait or mental health disorders among the learner drivers, or drivers attending National Driver Offender Retraining courses to stimulate educational instruction designed to mitigate poor driving and risk-taking behavior [20].

One of the superiority of the previous studies in this field to us is their use of validated questionnaires to evaluate the outcomes of their psychiatric interventions, while we have considered the rate of infringements after the commission as the determinant of the efficacy of restrictions for license renewal in individuals with personality traits. For instance, Alavi et al. applied the Manchester driving behavior questionnaire as a means to assess driving quality as well as the big five personality test (NEO personality inventory) and semi-structured interview (schizophrenia and affective disorders scale) to evaluate the mental disorders [13]. Another study in this area was performed by Bowen et al. who used a questionnaire with objective responses categorized based on a five-point Likert scale to determine the driving behaviors as well as International Personality Item Pool to define personality traits [20]. The use of these instruments enforces the generalizability of the data.

One of the secondary findings of this study revealed no association between the car producers, its chassis and the time of traffic accidents with the license renewal in the studied subjects. It has been well-described that the accidents in the cold seasons of the year, autumn and winter, can potentially lead to more severe outcomes [24]. Besides, Iranian cars due to their low quality might cause more harmful accidents [34]. Nevertheless, even significant improvements in the driving behavior of the studied subjects did not change these parameters.

In summary, we found that psychiatric schedules in order to reduce the risk of traffic impingements could efficiently affect the traffic behaviors of individuals with psychiatric traits, probably due to the impact of the psychiatric consultant or the menace of traffic license disqualification. Given that, we want to recommend further steps to early diagnosis of personality traits and perform psychiatric programs for all the individuals in the community particularly those with psychiatric disorders. Despite all the efforts made to make a generalizable data regarding the value of psychiatric commissions to renew the traffic license of the individuals with psychiatric disorders, some confounding variables that could remarkably affect the traffic behaviors such as any new implemented traffic laws, increased police patrolling, or public awareness campaigns during this period might be overlooked. Another matter that can question the findings of the current study refers to the small population of the studied females. This might partly have occurred due to the higher number of male drivers in Iran or the higher rate of impingements done by male compared with females. The other point in this issue refers to the higher rate of psychiatric disorders among men. Accordingly, further studies are strongly recommended.

Conclusion

Based on the findings of this study, the assessments revealed no significant difference at baseline versus follow-up in terms of the individuals' educational level, type of traffic infringements, type of the vehicles, the car producers, the time and also the location of accidents incidence. However, a psychiatry commission and shorter period of driving license renewal for the individuals with psychiatric disorders or personality traits who have had a history of traffic infringements or accidents led to significantly improved driving behaviors considering the significant decrease in the frequency of infringements per year, the incidence of hurt and death due to the traffic events and being responsible for the incidence of the accidents.

Conflict of Interest

The authors declare no conflicts of interest.

Ethical Approval

The ethical principles in writing this article have been observed according to the instructions of the National Ethics Committee and the COPE regulations.

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