DRIVING ANGER AND ANGER EXPRESSION IN DRIVERS WITH DEPRESSION AND ANXIETY DISORDERS

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ABSTRACT

Previous research revealed that driving anger and negative anger expression styles are risk factors for accidents and violent behaviors in traffic. Besides, the feeling of anger often accompanies psychiatric disorders. These two situations raise the question of whether individuals receiving psychiatric treatment are angrier in traffic environments. This study aims to compare drivers with depression or anxiety disorders, and drivers without any psychiatric disease regarding driver anger and anger expression styles. For this purpose, individuals with depression or anxiety disorders (n:119) were compared to the non-patient control group (n:119) in terms of driving anger and anger expression by using the driving anger scale (DAS) and the driving anger expression inventory (DAX). SPSS version 22.0 was used to analyze the data. According to the findings, there was no significant difference between patients with depression or anxiety disorders and the control group in terms of driving anger and driving anger expression based on the scores of DAS and DAX subscales ($p > 0.05$). These findings indicate that drivers with depression or anxiety disorders do not differ from non-psychiatric drivers regarding angry thoughts and behaviors in traffic. These results provide a new perspective for psychiatrists responsible for psychotechnical and driving license assessments.

Anahtar kelimeler: Automobile Driving, Anger, Depression, Anxiety Disorders

DEPRESYONU VE ANKSİYETE BOZUKLUĞU OLAN SÜRÜCÜLERDE SÜRÜCÜ ÖFKESİ VE ÖFKE İFADESİ

ÖZ

Yapılan araştırmalar, sürücü öfkesinin ve olumsuz öfke ifade biçimlerinin trafik ortamındaki kazalar ve şiddet davranışları için bir risk faktörü olduğunu göstermiştir. Bilindiği üzere öfke duygusu, psikiyatrik bozukluklara sıklıkla eşlik etmektedir. Bu iki durum, psikiyatrik tedavi gören bireylerin trafikte daha mı öfkeli oldukları sorusunu akıllara getirmektedir. Bu çalışmanın amacı, depresyon veya anksiyete bozukluğu olan sürücülerle psikiyatrik hastalığı olmayan sürücülerin sürücü öfkesi ve öfke ifade stilleri bakımından karşılaştırılmasıdır. Bu amaçla depresyonu veya anksiyete bozukluğu olan sürücülerle (n:119) herhangi bir psikiyatrik hastalığı olmayan kontrol grubu (n:119) sürücü öfke ölçeği (SÖÖ) ve sürücü öfke ifade envanteri (SÖİE) kullanılarak sürücü öfkesi ve öfke ifadesi bakımından karşılaştırılmıştır. Verilerin analiz edilmesinde SPSS 22.0 sürümü kullanılmıştır. Bulgular incelendiğinde SÖÖ ve SÖİE alt ölçek puanlarına göre depresyonu ya da anksiyete bozukluğu olan hastalar ile kontrol grubu arasında sürücü öfkesi ve sürücü öfke ifadesi açısından anlamlı fark bulunmamıştır ($p > 0.05$). Bu bulgular, depresyonu veya anksiyete bozukluğu olan sürücülerin, trafikteki öfkeli düşünce ve davranışlar açısından psikiyatrik hastalığı bulunmayan sürücülerden farklı olmadığını göstermektedir. Bu sonuçlar, psikoteknik ve ehliyet değerlendirmelerinden sorumlu psikiyatristlere yeni bir bakış açısı sunmaktadır.

Key words: Otomobil Sürme, Öfke, Depresyon, Anksiyete Bozuklukları

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INTRODUCTION

In traffic environments, drivers frequently experience anger and display anger-related behaviors (e.g., speeding, yelling out to another driver, brawling) (1). Feeling of anger emerging for any reason in drivers leads to dangerous vehicle use and traffic accidents (2). Studies conducted in traffic psychology have shown that anger negatively affects driver performance, leading to results such as driving faster, violating traffic rules more, and driving in risky proximity to the vehicle in front (3).

"Driving anger" is the term used for the propensity to become angry while driving and is conceptualized as a personality trait (4). Drivers who have high trait driving anger as a personality characteristic become angrier at various traffic conditions (1, 5). Measurement of trait driving anger has been a crucial issue for understanding driver behaviors, developing effective interventions to prevent anger-related negativities such as aggressive behaviors and traffic accidents (6).

The Driving anger scale (DAS) has been widely used to measure in which situations and to what degree drivers become angry (7). In other words, Driving Anger Scale measures trait driving anger. The developers of the DAS from Colorado State University, found six common situations that trigger anger in drivers (8). These include hostile gestures, illegal driving, police presence, slow driving, discourtesy, and traffic obstructions.

The ways how the drivers deal with anger while driving have also been investigated in the field of traffic psychology. Driver anger expression inventory was developed by Deffenbacher et al. (2002) to assess how drivers express their anger when they become angry on the road (9). According to that, there are four common anger expression styles. These involve adaptive/constructive expression, and three aggressive behaviours (personal physical expression, expression by using vehicle, and verbal expression). The previous research reported that young people, males, people with masculine features use negative expression styles more often (10-12). Studies using self-report scales revealed that negative anger expression styles are related to more accident involvement rates (13, 14). According to a recent research using driving simulator revealed that the way how the anger expressed is more dangerous than feeling anger (15).

A range of studies stated that mental health problems are related to aggressive behaviours while driving (16). Complaints about aggressive drivers being "mad" are implied to be related to psychiatric illness (17). Generalizing extreme situations to psychiatric patients has led to the common belief that mentally ill people are dangerous drivers (18). On the other hand, previous research in traffic psychology couldn't draw a clear conclusion that patients with depression or anxiety disorders are angrier and aggressive drivers (19, 20).

According to the previous research, the vast majority of patients who apply to psychiatry units are diagnosed with depression and anxiety disorders (21, 22). In a study sampling Turkish patients with various psychiatric conditions, it was reported that most of the licensed drivers have one of the diagnoses of depression and anxiety disorders (23). In current clinical practice in Turkey, people with anxiety disorders and depression are almost always referred to psychiatry units for the driving licence assessments.

As drivers with depression or anxiety disorders are frequently referred to psychiatry departments for driving license assessments, it's crucial to investigate the driving anger and anger expression styles of the drivers with depression and anxiety disorders. The aim of this study was to examine whether drivers with depression or anxiety disorders differ from those without psychiatric disorders in terms of driving anger and anger expression styles.

MATERIALS AND METHODS

Design and sample

This research was conducted in Gazi University Research and Training Hospital, Department of Psychiatry, between April 2018 and May 2018. The study sample included those who had been actively driving motor vehicles for at least one year. All the participants were licensed drivers and in the age range of 19-65. Prior to the study, the minimum number of participants were calculated as 88 patients vs. 88 control by using G*Power version 3.1.9.2. (Allocation ratio: 1/1, effect size: 0.5, power: 95%). Patients with depression or anxiety disorders (n=119) applying psychiatry unit for treatment completed measures of driving anger and anger expression. Then, results were compared to the non-patient control group (n=119). The control group was formed by using the convenience sampling method. The patient group included individuals who applied to outpatient clinics of the psychiatry department. The patients' diagnoses were determined by examining the hospital records, and diagnostic accuracy was achieved with individual interviews based on the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5). The patients who had depression or anxiety disorders in the past or present were included in the patient group. The patients with any diagnosis other than depression and anxiety disorders (e.g., alcohol and substance use disorders, personality disorders, psychotic disorders, bipolar affective disorder) were excluded from the study.

Measures

Sociodemographic data form

Sociodemographic data form covered age, gender, education level, marital status, driving frequency, traffic fines during the previous five years, and involvement in traffic accidents during the previous five years.

Driving Anger Scale (DAS)

The Driving Anger Scale is a Likert-type self-report scale that consists of 33 questions and aims to determine in which situations and how intensely the drivers get angry in traffic environments (8). Each item is scored between 1 to 5 (1 = not at all, 2 = a little, 3 = some, 4 = much, and 5 = very much). The scale includes six subscales that represent the conditions drivers get angry "hostile gestures," "illegal driving," "police presence," "slow driving," "discourtesy," and "traffic obstructions." The subscale scores are calculated by taking the mean scores of related items. The scale was reported to be a reliable and valid measure in Turkish people (24).

Driving Anger Expression Inventory (DAX)

It is a 49-item Likert-type scale that evaluates the frequency of four common anger expression styles while driving (9). Answer choices for each item range from 1 (almost never) to 4 (almost always). The

Turkish version of the scale was reported to be reliable and valid for the Turkish population. (25). As a result of this study, 4 factors were found similar to the original scale: 1) verbal expression (e.g., "I swear at the other driver aloud"), 2) personal physical expression (e.g., "I give the other driver the finger"), 3) expression by using vehicle (e.g., "I flash my lights at the other driver") and 4) adaptive/constructive expression (e.g., "I try to think of positive thinks to do"). The subscale scores are calculated by taking the mean scores of related items. There is also a subscale named aggressive expression index representing the sum of negative expression styles in the scale. The 18th question in the original of the scale was excluded from the Turkish scale because it did not fit any factor, and the 33th question was excluded due to cultural differences during the factor analysis (25).

Statistical Analysis

SPSS 22.0 package program was used to analyze the data obtained from the participants. Descriptive statistics were presented as mean ± standard deviation, median (minimum-maximum), and percentage. In the evaluation of categorical variables, Pearson Chi-Square Test and Fisher's Exact Test were used. The Shapiro-Wilk test was used to examine whether the continuous data were normally distributed in the control and patient group. When the data were normally distributed, independent samples t-test was used. Mann-Whitney U test was used for the data not normally distributed.

RESULTS

The sociodemographic characteristics of participants were presented in (Table 1). The participants in the non-patient community sample included 119 (80 males, 39 females) drivers (Mean age: 36.6 ± Standart Deviation: 8.6). The proportion of those with high school or lower education was 31.1% (n=37), and those with university and upper education 68.9% (n=82). The proportion of having traffic fines in the last five years was 33.6% (n=40), and the traffic accident rate was 19.3% (n=23) in the community sample.

The participants in the patient group included 119 (74 males, 45 females) drivers (Mean Age: 36.5 ± Standart Deviation: 11.1). The proportion of education levels were 39.5% (n=47) for those with high school and lower education and 60.5% (n=72) for university and upper, respectively. The proportion of having traffic fines in the last five years was 29.4% (n=35), and the traffic accident rates were 26.1% (n=84) in the community sample. The proportion of patients with diagnosis of depression was 21% (n=25), with diagnosis of anxiety disorders were 26% (n=31). The proportion of patients who had both diagnoses of depression and anxiety disorders were 52.9% (n=63). The percentage of patients who were using psychotropic medications was 70% (n=84). The control and the patient groups had similar age, gender, educational status, traffic fines in the last five years, and traffic accident rates ($p>0.05$).

The patient group was compared to control in terms of driving anger and anger expression. According to the findings, there was no statistically significant difference between two groups ($p>0.05$). The situations where the frequency of anger experienced by Turkish drivers were from more frequent to less were illegal driving, discourtesy, hostile gestures, traffic obstructions, slow driving, police presence,

respectively in both groups. The most common used anger expression style when feeling angry on the road was adaptive/constructive expression style in both groups. The negative expression styles from more frequent to less were verbal expression, expression by using vehicle, and personal physical expression, respectively (Table 2).

Table 1. Sociodemographic properties of the control and the patient group

	Control (N:119)	Patient (N:119)	Significance
Sex			
Male	80 (67.2)	74 (62.2)	P=0.4
Female	39 (32.8)	45 (37.8)	
Age	36.6 ± (8.6)	36.5 ± (11.1)	P=0.9
Education level			
High school or lower	37 (31.1)	47 (39.5)	P=0.1
University or higher	82 (68.9)	72 (60.5)	
Traffic fines in the last five years			
Yes	40 (33.6)	35 (29.4)	P=0.4
No	79 (66.4)	84 (70.6)	
Traffic accident as a result of own fault			
Yes	23 (19.3)	31 (26.1)	P=0.2
No	96 (80.7)	88 (73.9)	

Independent sample t-test was used to compare the age variable and the results were presented as mean ± (standard deviation). Appropriate chi-square tests were used to compare other sociodemographic characteristics, and the results were presented as numbers (%).

Table 2. Comparison of DAS and DAX subscale scores of the control group and patient group

	Control (n: 119)	Patient (n:119)	Significance
DAS[1]			
Discourtesy	3.32±0.86	3.41±0.78	P=0.36
Police presence	1.98±0.79	2.17±0.89	P=0.09
Hostile gestures	3.27±1.07	3.39±1.06	P=0.38
Illegal driving	3.38±0.91	3.44±0.87	P=0.61
Slow driving	2.86±0.78	2.94±0.74	P=0.42
Traffic obstructions	3.02±0.84	3.01±0.84	P=0.93
DAX[2]			
Verbal expression	1.9 (1-4)	1.9 (1-3.5)	P=0.84
Personal physical expression	1.1 (1-3.3)	1.1 (1-3)	P=0.63
Expression by using vehicle	1.3 (1-3.8)	1.3 (1-3)	P=0.28
Adaptive/constructive expression	2.73 (1-3.87)	2.73 (1.07-4)	P=0.74
Aggressive expression index	46(32-114)	48(32-96)	P=0.36

1: The data was normally distributed in all subscales; therefore, independent samples t test was used. Descriptive statistics were presented as mean ± standard deviations.
2: The data was nonnormally distributed in personal physical expression, expression by using vehicle and aggressive expression index subscales; therefore, for the sake of uniformity of data Mann-Whitney U test was used in all subscales. Descriptive statistics were presented as median (minimum - maximum)
DAS: Driving Anger Scale, DAX: Driving Anger Expression Inventory

DISCUSSION

To our best knowledge, this is the first study investigating driving anger and anger expression styles of drivers with clinical depression and anxiety disorders in a Turkish community sample. According to the findings, the drivers diagnosed with anxiety disorders or depression didn't differ with regard to driving anger and anger expression styles. A key strength of the present study was that of psychiatrists made diagnoses by combining DSM-5 based psychiatric interviews and hospital records. Therefore, the actual patients were included in the study. The other crucial point was the exclusion of psychiatric disorders other than depression and anxiety disorders.

A range of studies proposed that psychiatric patients with intermittent explosive disorder, current or past alcohol or substance abuse or dependence, antisocial and borderline personality disorders, conduct disorder, and attention-deficit/hyperactivity disorder are more likely to display aggressive behaviors while driving (26-30). It seems there is a consensus that patients with these disorders are more likely to be aggressive drivers. On the other hand, the impact of anxiety disorders on driver aggression is not clear (16). In one of the rare studies examining the relationship between psychiatric disorders and driver agression, Malta et al. (2005) used the driver stress profile to separate participants into aggressive (n=44) and non-aggressive drivers (n=44). The authors reported that intermittent explosive disorder, alcohol or substance use disorder, cluster B personality disorder, attention deficit hyperactivity disorder, and behavior disorder were significantly more frequent in aggressive drivers. On the other hand, there was no significant difference between the two groups regarding anxiety disorders and mood disorders (27). In contrast, some studies using self-report psychological constructs found a significant relationship between anxiety and depressive symptoms and driver aggression (31-34). A study sampling Norwegian adolescent (n=1356) found a non-linear U-shaped relationship between anxiety symptoms and driving behaviors (35). The authors stated that the average controllable level of anxiety doesn't negatively affect driver behaviors. They also found that very low or very high levels of anxiety were related to risky driving behaviors. The trait anxiety wasn't correlated with trait anger (named as irritability in the study) that was measured by using the Driving Anger Scale.

Although the majority of epidemiological research propose that depression has an impact on driver aggression, it's difficult to draw any firm conclusion from the previous studies (20). For example, interestingly, a recent preliminary driving simulator study with a small sample size (13 patients vs. 18 healthy controls) investigating behaviors of depressive patients reported that depression was negatively related to aggressive driving (36). About one third of depressive patients especially those with comorbid axis-2 disorders (e.g., antisocial personality disorder, borderline personality disorder) display anger attacks that highly respond to

antidepressant treatment (37). On the other hand, depressive patients tend to display anger and related acts to immediate family members (38). Therefore, depressive patients may display angry behaviors less in traffic environments than they show to family members. In addition, driving anger is less mixed with other emotions, has a sudden occurrence, communication is insufficient between drivers, and is less affected by mood (39). Thus, cognitive biases that are features of depression may not be related to feelings of anger in traffic environments.

In the current clinical practice, the main focus when evaluating drivers in license examinations is their medical records. On the other hand, according to current diagnostic systems, individuals with no psychopathology may behave in a way that can harm themselves or their environment in some situations. Anger-related problems can be seen in individuals with psychiatric disorders and those without (40). Although anger and related behaviors in traffic can be related to psychopathology in some cases, the same problems can be encountered in individuals who do not have any diagnosis in their medical records.

The crucial point in examining the relationship between psychological problems and driver behaviors is that similar psychological symptoms can be seen in different disease groups. For example, assume a study solely based on a scale measuring depressive symptoms. In this manner, comorbid mental disorders such as personality disorders, alcohol and substance use disorders may be overlooked. Consequently, angry driving and negative anger expression styles may be attributed to depression. Therefore, such studies with careful diagnostic evaluation and sampling clinical cases are valuable when investigating driver behaviors.

The findings of this study have to be seen in the light of some limitations. The first of the limitations is that the patients' diagnoses were determined by combining clinical interviews and a review of hospital records. Psychological scales were not utilized to determine the diagnoses of the patients. Thus, this study doesn't consider the severity of psychological symptoms and the control group's subthreshold depressive and anxiety symptoms. The second limitation is that, the data obtained from participants involving driving anger and anger expression were based on self-report.

CONCLUSION

The results of this study indicate that driving anger levels and anger expression styles are similar among drivers diagnosed with anxiety disorders or depression and those with no psychopathology. Angry driving and negative anger expression styles are not attributable to the two most common psychiatric disorders, depression and anxiety disorders. These findings may contribute to traffic psychology and provide a new perspective for psychiatrists in the driver's license evaluations of patients diagnosed with depression or anxiety disorders.

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Conflict of Interest: The authors report no conflict of interest.

Ethical Statement

This study was approved by Gazi University Ethics Committee (protocol number: 77082166-302.08.01). Written informed consent was obtained from each participant.

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