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A Descriptive Cross-Sectional Study on Prevalence of Driving Anger Amongst Adolescent Population in Designated Zones Within Bhopal, India

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ABSTRACT

This descriptive cross-sectional study investigates the prevalence of driving anger among adolescents in designated zones within Bhopal, India. Anger, characterized as a hostile emotional state, holds potential for harmful behaviors. The study explores the development of anger from childhood to adolescence, emphasizing its relevance to driving behavior. The concept of "road rage" is defined, illustrating its intersection with driving anger. The research employed a questionnaire-based approach, collecting data on socio-demographic profiles and utilizing the Deffenbacher Driving Anger Scale (Short Scale) to assess driving anger levels. The study's significance lies in addressing the growing concern of road rage incidents among young drivers in India. It is revealed that about 87% of the study population has higher levels of driving anger.

Keywords: Adolescents, driving anger, road rage, Deffenbacher Driving Anger Scale.

INTRODUCTION

Anger constitutes an emotional state or a display of hostile behavior. As per the Oxford dictionary, it involves a feeling of antipathy or ire, leading to forceful or antagonistic actions. In the realm of psychology, the term "anger" encompasses a range of behaviors that may result in harm, whether physical or psychological, inflicted upon oneself, others, or occasionally even objects within the surrounding milieu. Historically, certain psychologists such as Sigmund Freud and Konrad Lorenz have posited that angry behavior is intrinsic, whereas a multitude of others have posited it as a learned response.[1] In the course of childhood, such irate tendencies are perceived as a normal facet of maturation and development.[2] The impact of anger undergoes transformation throughout an individual's lifespan. During early childhood, anger primarily manifests in the physical domain due to a dearth of verbal aptitude. As linguistic skills mature, they are employed to articulate irate inclinations.[3] Outbursts of temper tantrums serve as one of the avenues for venting anger, typically peaking during toddlerhood and gradually subsiding by the age of five.[4] Evident during early childhood are acts such as biting, crying, screaming, kicking, as well as the deliberate destruction of objects.[5] In the early stages of childhood, the exhibition of angry behavior may be prompted by reactions to parental authority, strictures, and exaggerated expectations. Subsequently, as social interactions increase, anger may be directed towards peers.[2]As development progresses, the display of anger evolves to encompass activities such as teasing, brawling, bullying, irritability, acts of arson, and cruelty towards animals. Autonomic arousal plays a pivotal role in adolescent anger, whereby the activation of the autonomic nervous system, a component of the fight-flight response, primes the individual for physical action.[6] More grave forms of violence emerge during the initial phases of

adolescence, such as gang altercations and the use of weaponry. In the later stages of adolescence, the repertoire expands to encompass gun use, truancy, collaborative theft, participation in gang activities, and engagement in delinquent subcultures, including road rage.[7]

The concept of "angry driving behavior" is characterized by actions that are deliberate in nature, likely to heighten the risk of collisions, and motivated by impatience, irritation, animosity, and/or a desire to economize time.[8] The term "road rage," first popularized by the media in the 1980s, refers to hostile conduct directed at fellow road users.[9] Britt and Garrity (2003) elucidated road rage as a spectrum ranging from mild to severe manifestations of driving anger when confronted with provocation.[10] Incidents of vehicular violence constitute a grave manifestation of anger that is ubiquitous and pervasive, affecting a wide cross-section of individuals. Road rage exemplifies a particular form of vehicular violence, taking the form of verbal, physical, emotional, and even sexual anger, at times escalating to injuries or fatalities, insults, or threats. Definitions of road rage often remain implicit, yet it can be understood as an occurrence wherein an agitated or impatient driver intentionally inflicts physical or emotional harm upon another motorist, passenger, or pedestrian.[11] The conceptual framework of road rage entails the confluence of anger, driving-related anger, and angry driving behavior.[12]

Figure 1: Venn diagram illustrating how driving, general anger, road rage and aggressive driving are inter-related.[12]

As shown in above Venn diagram it is clearly mentioned that road rage overlaps with driving anger thus road rage could be considered as a form of anger which occurs only in the context of driving.[12]Anger is a felt emotion by any individual.[13,14] (Bhave & Saini,2009; Williams, 2011). Sometimes it emerges in response to a provocation or threat, for self protection from dangers.[15] (Reis-Dennis, 2018). It's observed that violence and aggression issues are more common in adolescents, verbal conflicts, physical attacks, rejections and complaints triggers their anger.[16]

Background of the study

According to data from the World Health Organization (WHO), road traffic accidents account for a greater number of global fatalities than many diseases combined, making them a primary cause of death among individuals aged 5 to 29, especially children and young adults (WHO, 2018).[17] It is estimated that each year, over 1.2 million lives are lost due to road accidents, and a staggering 20 million individuals suffer enduring disabilities as a result of these crashes. Furthermore, more than 90 percent of these traffic incidents are attributed to human errors, encompassing actions such as speeding, reckless driving,

driving under the influence, and instances of road rage.[19] Road traffic accidents are also intricately linked to heightened levels of psychological distress (Craig et al., 2016),[20] as a recent meta-analysis has concluded that the collective prevalence of post-traumatic stress disorder among survivors of road traffic accidents exceeds 20% (Lin et al., 2018).[21] Reports indicate that in 2017, medical and ancillary expenses stemming from road traffic accidents surpassed $75 billion in the United States alone (Center for Disease Control and Prevention, 2020).[22] The act of driving, inherently rife with stress, can swiftly ignite feelings of anger triggered by minor provocations encountered on the road. This resultant driving-induced anger can manifest as a spectrum of aggressive, forceful, and antagonistic behaviors collectively referred to as road rage. Road rage encompasses an array of aggressive driving actions, spanning from comparatively mild expressions such as vocally exhibiting frustration through sealed windows or employing high beam headlights to signal displeasure, to more severe manifestations like shouting, honking, verbal abuse, discharging firearms, vehicular collisions, and pursuing other vehicles. Such behavior has the potential to escalate into criminal offenses, deliberate violence, and even fatalities. A majority of road traffic accidents have been associated with factors like intoxication, fatigue, and driver aggression (Petridou and Moustak., 2000).[23] As estimated by The American National Highway Traffic Safety Administration, approximately 67% of road crash fatalities in the USA involve aggressive driving or road rage (Goodwin et al., 2015).[24] In the past, numerous studies have adopted various methodologies to investigate the phenomenon of road rage. Among these, the questionnaire method has gained prominence as the most widely employed approach to decipher the underlying causes of driving-related anger. Wickens et al. (2015), for instance, employed questionnaires to gauge the influence of adolescent experiences and gender on road rage.[25] Sârbescu, Stanojević, and Jovanivić (2014) undertook research to ascertain whether diverse cultures exert any influence on road rage, utilizing questionnaires dispatched to study participants' residences in Romania and Serbia.[26] Shinar and Compton (2004) conducted an observational study focusing on aggressive driving behaviors, documenting perilous driving actions of adolescent drivers, such as unwarranted honking, improper overtaking, and improper lane changes.[27] In a meta-analysis, Zhang and Chan (2016) confirmed a consistent correlation between road rage and traffic accidents, although the exact proportion involving rage remains unclear.[28] Proposals concerning road rage have captivated scientific interest for over seven decades, as underscored by Tillmann and Hobbs (1949), although exploration in this domain is often fragmented across disciplines, leaving many questions unanswered.[29] The central objective of this study was to discern the risk of driving-induced anger among adolescents.

Need of the study

In contemporary times, a notable surge in incidents of road rage has been observed, particularly among younger drivers, marked by their engagement in reckless driving, altercations amidst traffic, unwarranted honking, and the display of aggressive conduct. These actions have resulted in an escalation of road traffic accidents and a corresponding upswing in mental health concerns.[18] Despite this concerning trend, the landscape of Indian research on road rage, particularly as it pertains to adolescent drivers, remains sparse and inadequately informative. Notwithstanding, the statistical revelations pertaining to road rage are profoundly disconcerting. According to the 2015 statistics released by the National Crime Records Bureau (NCRB), Kerala, Tamil Nadu, Madhya Pradesh, Karnataka, and Maharashtra are the five primary states in India contributing to the highest incidence of road rage cases. Cumulatively,

instances of road rage and reckless driving across the nation tallied up to 451,069, signifying that nearly 33 individuals out of every 100,000 succumbed to fatalities in road accidents. Delving deeper into the NCRB's report, it emerges that a total of 1,538 adolescents faced charges under Section 279 IPC, pertaining to causing injuries due to reckless driving or road rage. Within this cohort, 238 individuals were aged between 12 to 16 years, with an astonishing 08 of them being below the age of 12! Remarkably, the capital city, New Delhi, alone accounted for approximately 61 cases of juvenile offenders booked under this section.[30]

MATERIALS & METHODS

Research Design: The research design used for this study is descriptive cross-sectional design.

Study setting: Study was conducted in Karond and Bhanpur areas of Bhopal city.

Study Population: Adolescents residing in Karond and Bhanpur areas of Bhopal city (MP).

Study Sample: Adolescents with designated criteria, who are willing to participate in the study, residing in Karond and Bhanpur areas of Bhopal city (MP).

Sample Size: 60 adolescents

Sampling Technique: Simple random sampling technique is used to select the study sample.

Criteria for Sample Selection:

Inclusion criteria- Adolescents both male and female, those are willing to participate in the study, who understand Hindi or English (read and speak) and are available at the time of study.

Exclusion criteria- Adolescents who are not able to understand Hindi or English and are not willing to participate in the study.

Description of Tools: The data collection process involves the utilization of two distinct components. ***Part A*** pertains to the Socio-Demographic Profile, encompassing essential demographic details of the participants. This segment encompasses eight data points, encompassing age, gender, occupation, lifestyle, educational background, substance utilization, prior psychiatric history, and the history of treatment for aggressive tendencies. ***Part B*** encompasses the employment of the Deffenbacher Driving Anger Scale (Short Scale). This standardized abbreviated version of the scale comprises 14 carefully constructed questionnaires, designed to gauge the extent of driving anger or aggressive driving behavior within the sample under study. The questionnaire probes the participants' reactions to situations involving illegal driving, hostile gestures, encounters with law enforcement, traffic impediments, slow driving instances, and discourteous conduct. Respondents are required to select a response from among five provided choices for each question, with responses graded on a scale of 1 to 5: 1. Absent, 2. Slight, 3. Moderate, 4. Significant, 5. Profound. The cumulative Driving Anger score is computed as the sum of responses across items 1 to 14. Higher scores on this scale correspond to heightened levels of driving anger.

Ethical clearance and Informed consent: Approval from the Institutional Ethical Committee, PCNRC, Bhopal was obtained prior to data collection and all the participants signed informed consent, also the rights of the participants have been secured.

Procedure: Ethical endorsement from the Institutional Ethics Committee (IEC) and requisite administrative authorization from the Ward Officer of Bhopal Municipal Corporation, specifically from Ward No-79, were successfully procured. The study population consisted of a total of 80 individuals who met the stipulated criteria, and they were selected in a random fashion from both the Karond and Bhanpur localities. Ultimately, 60 eligible individuals participated in the study after accounting for availability. A comprehensive explanation

of the study was provided to each participant, following which their informed consent was duly obtained. Subsequently, the Deffenbacher Driving Anger Scale - short form, comprising 14 carefully devised questionnaires, was administered to the participants, and the ensuing results were subjected to meticulous analysis.

STATISTICAL ANALYSIS

In this study, the gathered data underwent meticulous organization, tabulation, and analysis encompassing both descriptive statistics – encompassing percentages, frequencies, means, medians, modes, and standard deviations.

Descriptive Statistics:

Demographic variables were categorized and presented in frequencies, accompanied by their corresponding percentages. Measures such as mean, median, mode, and standard deviation were employed to evaluate the levels of driving anger.

RESULT

The aim of the study was to find out the prevalence of driving anger amongst adolescents. The diversity of the study population was as follows.

Age distribution: Out of the total 60 participants in this study, 30 (50%) adolescents were 18 years of age and 30 (50%) were 19 years of age.

Gender distribution: In total 48 (80%) were males and 12 (20%) were females.

Occupation distribution: Among the study participants 3 (5%) were delivery boys, 8(13.33%) were drivers, 27 (45%) were students, 10 (16.67%) were factory workers and 12 (20%) were of other occupations like shop keeper, tailor, carpenter, waiter and butcher.

Education distribution:

All the participants were educated; none was an un-educated. (Inclusion criteria of the study mentioned that, this study is conducted only among the educated adolescents those who can read and write).

Life-style distribution:

Among the participants 7(11.67%) were leading sedentary life-style and 53 (88.33%) were leading active life-style. No participant was using any substance, having any previous psychiatric illness and undergoing any treatment for aggression.

Table 1: Demographic profile

S No	Demographic Variables		N (60)	%
1	Age	18 Years	30	50
		19 Years	30	50
2	Gender	Male	48	80
		Female	12	20
3	Occupation	Delivery boy	3	5
		Driver	8	13.33
		Student	27	45
		Factory Worker	10	16.67
		Others	12	20.00
4	Education	Educated	60	100.00
		Uneducated	0	0.00
5	Life style	Sedentary	7	11.67
		Active	53	88.33
6	Substance Use	Yes	0	0.00
		No	60	100.00
7	Previous Psychiatric History	Yes	0	0.00
		No	60	100.00
8	Present Treatment	Yes	0	0.00
		No	60	100.00

Result – Table 1: **Shows the demographic information of the adolescents who participated in this study.**

Figure 2: Demographic profile

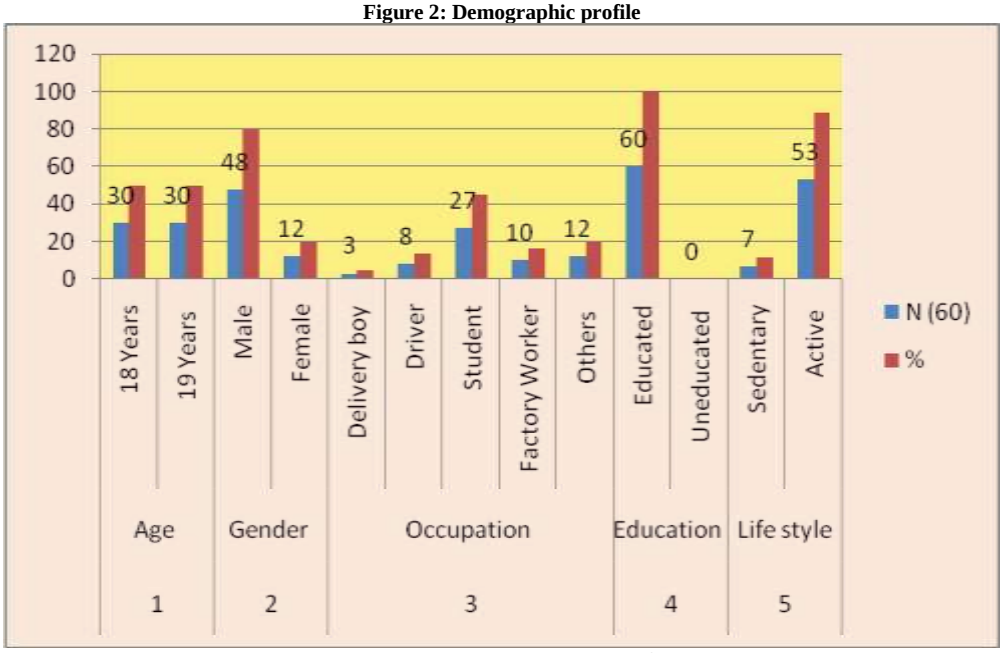

Figure 2: Depicts Demographic Distribution of participants.

Table 2: Each question wise score and percentage of Driving Anger among participants.

Q. No	Question Statement	Driving Anger Score								
		None at all	A little	Some	Much	Very much	Maximum Score	Mean	SD	% of Mean score
		1	2	3	4	5				
1	Someone is weaving in and out of traffic.	4	15	16	18	7	5	2.9	1.2	58%
2	A slow vehicle on a mountain road will not pull over and let people by.	4	17	21	8	10	5	3.2	1.3	64%
3	Someone back right out in front of you without looking.	5	9	13	11	22	5	3.8	1.4	76%
4	Someone runs a red light or stop sign.	6	11	20	14	9	5	3.2	1.3	64%
5	You pass a radar speed trap.	1	8	12	16	23	5	3.8	1	76%
6	Someone speeds up when you try to pass him/her.	2	7	13	22	16	5	3.9	1	78%
7	Someone is slow in parking and is holding up traffic.	1	2	18	15	24	5	3.9	0.9	78%
8	You are stuck in a traffic jam.	3	5	12	20	19	5	4.1	1	82%
9	Someone make an obscene gesture toward you about your driving.	13	4	10	18	15	5	3.6	0.9	72%
10	Someone honks at you about your driving.	4	6	8	25	17	5	3.9	1.1	78%
11	A bicyclist is riding in the middle of the lane and is slowing traffic.	2	5	11	23	19	5	3.7	1	74%
12	A police officer pulls you over.	3	8	19	15	15	5	3.7	1.2	74%
13	A truck kick up sand or gravel on the car you are driving.	0	2	21	25	12	5	3.8	0.9	76%
14	You are driving behind a large truck and you cannot see around it.	1	4	20	21	14	5	3.8	1	76%

Result- Table 2: Shows each question wise score, mean, standard deviation and mean percentage of driving anger among the participants.

Table 3: Levels of driving anger score

Levels of Driving Anger	Participants	
	No. of Adolescents	%
Lower Anger level	8	13.33
Higher Anger level	52	86.67

Result - Table 3: Indicates the levels of driving anger among the participants.

Figure 3: Levels of driving anger

Figure 3: Pie diagram depicting levels of driving anger among the participants.

DISCUSSION

The findings of this study shed light on the alarming prevalence of driving anger about 87% of higher anger level among adolescents in Bhopal, India. The data gathered from participants revealed substantial levels of driving anger, as indicated by the Deffenbacher Driving Anger Scale scores. Several factors could contribute to the heightened levels of driving anger observed in this study. The congested and often chaotic traffic conditions in Indian cities, combined with impatience and inexperience among young drivers, likely contribute to the manifestation of driving anger. The study's results also underscore the urgent need for interventions and educational initiatives aimed at curbing driving anger and promoting safer road behaviors among adolescents. Efforts to enhance road safety must address not only the technical aspects of driving but also the psychological and emotional factors that contribute to road rage. Educational campaigns, driver training programs, and public awareness initiatives could play a pivotal role in mitigating the prevalence of driving anger and its potential consequences.

CONCLUSION

In conclusion, this descriptive cross-sectional study underscores the concerning prevalence of driving anger among adolescents in designated zones within Bhopal, India. The findings highlight the importance of addressing this issue to enhance road safety and reduce the incidence of road rage incidents. By implementing targeted interventions, educational initiatives, and awareness campaigns, policymakers and stakeholders can contribute to fostering a safer driving environment for adolescents and the general public alike. Ultimately, such efforts have the potential to lead to a significant reduction in road traffic accidents and their associated physical and psychological consequences.

Declaration by Authors

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