A Cross-Sectional Study for The Detection of The Level of Driver’s Anger Using a Driver Anger Scale (DAS) Administered on Non Professional Drivers of Indore City

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Date of Submission: 23.09.2013 Date of Acceptance: 01.04.2014

Abstract

Introduction: Road rage is a term to describe a range of anti-social behaviors and/or acts of aggression which occur on the road. Objective: The study aims to assess the level of anger while driving, which is a prevalent condition in today’s society due to motorist’s frustrations during heavy traffic volumes and various factors affecting it. Methodology: The present study was done in 200 people of Indore city which includes medical students and faculties /staff. A pre designed Pre-Tested, Semi-Structured Questionnaire was administered to participants. Questionnaire comprises of biographic data and Driving Anger Scale (DAS). Observation: The mean DAS of in the study population of Indore city was found to be 2.896 (s.d. =636) with Males 2.875 (s.d.=.627) & Females 2.930(s.d.= .627) having no significant gender difference. The people who were still unemployed/ students got the maximum anger 3.105( s.d. =.659), and are mostly driving two wheelers. The study population responded most to Hostile Gesture with mean anger level of 3.27, followed by Traffic obstruction (mean =3.10), more common in females (mean=3.25). Anger level was high during peak hours of traffic but was not affected on increasing frequency of usage of vehicles and or distance travelled. Conclusion: The mean anger level in population of Indore City was found to be high (2.896) especially in youngsters (3.105) who contribute significantly for rise in Road Traffic Accident in the City.

Key Words: Driving Anger Scale, Road Rage, Accident, Hostile Gesture.

Introduction

The rapid and unplanned urbanization in India along with rise in number of motor vehicles lead to an alarming increase in morbidity and mortality owing to road traffic accidents (RTA) over the past few decades. Currently motor vehicle accidents rank ninth in order of disease burden and are projected to be ranked third in the year 2020(1). In India, more than 70,000 people get killed due to RTA every year, and this needs to be recognized as an important public health issue. The road traffic accidents cause sudden and unexpected loss of lives and earnings more common in metro cities. The causes are many but loss of temper/ rise in anger of the drivers can’t be excluded from the list. An early address of this problem is urgently required to bring down the general stress level and to effectively contribute to social and economic stability. “Road rage” is a term coined by the media to describe a range of anti-social behaviors and/or acts of aggression which occur on the road. It includes minor instances such as gestures and use of the car horn, through to more serious violent acts such as assault or even murder”.

Activities associated with road rage include: Beeping the horn flashing head lights, forcing a car off the road, verbal abuse, threatening another driver, applying brakes or slowing suddenly suddenly, damaging another vehicle intentionally, deliberate obstruction, physically assaulting another driver and such similar acts.(2)
This study was focused on general population who drive daily in Indore to assess the anger level among the drivers using a Driver Anger Scale.\(^3\)

**Methodology**

Present study is a cross sectional study done on population who drive on a regular basis i.e. at least 2 hours per day for four days a week in Indore city. Period of study was for three months from September –December 2013. Purposive sampling was done, where a pre-decided sample size of 200 people were selected for the study which included 50 medical students, 50 faculties of medical college and 100 of the general population around a radius of 5 kilometer around Mahatma Gandhi Memorial Medical College, Indore, who first gave consent for the study. The public transport drivers and people residing outside Indore city were excluded from the study. Thus study population was all non professional drivers considering professionals as those relating to or engaged in an driving as one’s main paid occupation.

The tool for study was a pre-designed, Pre-tested, Semi-structured Questionnaire Comprising of Demographic data (Name, Age, Sex, address etc ) and DAS, the 33 item, original DAS (Deffenbacher et al, 1994) with the exclusion of two questions which were not applicable to Indore. The subscales were: Hostile gestures, illegal driving, slow driving, Traffic obstructions, Discourtesy and Police presence. The participants were required to record the amount of anger they would experience in response to each item (1- not at all angry, 2- a little angry, 3- some anger, 4- much anger, 5- very much angry).

The questionnaire was administered to the medical faculties and students and people residing around MGMMC (Part 1-Demographic data and Part 2- DAS) during their free time with their consent. The collected data was entered into MSEXCEL spreadsheet and analyzed using SPSS (Statistical package for social sciences). Statistical tests like Mann-whitney U and Kruskal – Wallis were applied.

**Results**

The study comprised of 123(61.5%) males and 77(38.5%) females, with maximum persons of the age group 15-24 years (36%). Among these 200, 142 (71%) drive two wheeler and 18(9%) drive both two and four wheelers.

The mean anger level of the study population was found to be 2.8969 with (s.d. =.6364). This did not vary significantly with gender (males -2.875 and females -2.930, \(p\) value-0.558). Level of anger was found higher in younger age compared to elder age groups (mean 3.116 with s.d.= 0.668,\( p\) value=0 .009) as seen in the table 1.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Age group</th>
<th>Mean</th>
<th>Number</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>15-24</td>
<td>3.11618</td>
<td>72</td>
<td>.6688542</td>
</tr>
<tr>
<td>2.</td>
<td>25-34</td>
<td>2.820323</td>
<td>64</td>
<td>.6026090</td>
</tr>
<tr>
<td>3.</td>
<td>35-44</td>
<td>2.792571</td>
<td>37</td>
<td>.5935404</td>
</tr>
<tr>
<td>4.</td>
<td>45-60</td>
<td>2.680000</td>
<td>26</td>
<td>.5516013</td>
</tr>
<tr>
<td>5.</td>
<td>More than 60</td>
<td>2.13000</td>
<td>1</td>
<td>.6371891</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2.897604</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Mean level of anger in different age groups (N=200)
Table 2: Subscale mean and Gender distribution (n=200)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Subscale</th>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
<th>Std. Deviation</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Slow driving</td>
<td></td>
<td>2.603707</td>
<td>2.601688</td>
<td>0.7546314</td>
<td>0.986</td>
</tr>
<tr>
<td>2.</td>
<td>Illegal driving</td>
<td></td>
<td>3.0920</td>
<td>2.9103</td>
<td>0.95038</td>
<td>0.155</td>
</tr>
<tr>
<td>3.</td>
<td>Discourtesy</td>
<td></td>
<td>2.987317</td>
<td>2.987273</td>
<td>0.7244241</td>
<td>1.00</td>
</tr>
<tr>
<td>4.</td>
<td>Traffic obstruction</td>
<td></td>
<td>3.004797</td>
<td>3.257922</td>
<td>0.8456643</td>
<td>0.029</td>
</tr>
<tr>
<td>5.</td>
<td>Police presence</td>
<td></td>
<td>2.2415</td>
<td>2.2570</td>
<td>0.94141</td>
<td>0.906</td>
</tr>
<tr>
<td>6.</td>
<td>Hostile gestures</td>
<td></td>
<td>3.2598</td>
<td>3.2912</td>
<td>0.93242</td>
<td>0.835</td>
</tr>
</tbody>
</table>

(Mann-whitney U test applied).

Anger level in motorcyclists (2.985, s.d. =0.607) was significantly higher compared to car drivers (2.708, s.d.=0.008). People who were not driving habitually during in peak traffic hours (mean, s.d. = 3.03, .627), had significantly higher anger level(p-value=.005) compared to those who were driving regularly in peak hours (mean,s.d.=2.8,0.63) . Persons driving occasionally had higher anger level (mean,s.d. = 2.95,.63), than the regular/ daily drivers, but the difference was not significant(p-value=.589). Level of anger did not significantly vary with the distance travelled per day(p-value=.675).

Table 3: Mean anger level according to different subscale in different groups of Study Population

<table>
<thead>
<tr>
<th>S. No</th>
<th>Subscale</th>
<th>No. of items</th>
<th>Students (mean, s.d.)</th>
<th>Faculties (mean, s.d.)</th>
<th>General population (mean, s.d.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Slow driving</td>
<td>6</td>
<td>2.81, 0.88</td>
<td>2.39, 0.60</td>
<td>2.60, 0.73</td>
</tr>
<tr>
<td>2.</td>
<td>Illegal driving</td>
<td>2</td>
<td>3.01, 0.97</td>
<td>2.67, 0.63</td>
<td>3.02, 0.94</td>
</tr>
<tr>
<td>3.</td>
<td>Discourtesy</td>
<td>8</td>
<td>3.16, 0.82</td>
<td>2.76, 0.55</td>
<td>2.98, 0.71</td>
</tr>
<tr>
<td>4.</td>
<td>Traffic obstruction</td>
<td>7</td>
<td>3.45, 0.81</td>
<td>2.97, 0.69</td>
<td>3.10, 0.84</td>
</tr>
<tr>
<td>5.</td>
<td>Police presence</td>
<td>3</td>
<td>2.38, 0.89</td>
<td>2.27, 0.93</td>
<td>2.24, 0.91</td>
</tr>
<tr>
<td>6.</td>
<td>Hostile gestures</td>
<td>3</td>
<td>3.63, 1.03</td>
<td>2.79, 0.77</td>
<td>3.27, 0.99</td>
</tr>
</tbody>
</table>

Higher anger level was found in persons with type A personality (mean, s.d. = 3.052,0.639,)as compared to type B personality(mean, s.d. =2.78,0.61, p-value=.004). As seen in the table below (Table 2) people registered higher level of anger for hostile gestures and illegal driving and lower levels in the police presence.

There was no significant difference in anger level in male/ female (p-value=.558) and on different subscales of DAS except in Traffic obstruction where Females showed higher level of anger (p-value=.029) as seen in Table 2.
Students of MGM Medical College and General population around MGMMC responded most to Hostile Gesture with mean anger level of 3.63 and 3.271 whereas faculties of MGMMC showed high level of anger in traffic obstruction 2.97.

Table 4 shows item wise distribution of means and standard deviation of various items on the DAS scale.

Table 4: Reasons (item-wise) Mean and Standard Deviation in the study population (n=200)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Items (in the DAS scale)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Someone in front of you does not move off straight away when the light turns green.</td>
<td>2.29</td>
<td>1.014</td>
</tr>
<tr>
<td>2.</td>
<td>Someone is driving too fast for the road Conditions.</td>
<td>2.90</td>
<td>1.107</td>
</tr>
<tr>
<td>3.</td>
<td>A pedestrian walks slowly across the middle of the street, slowing you down.</td>
<td>2.46</td>
<td>1.147</td>
</tr>
<tr>
<td>4.</td>
<td>Someone is driving too slowly in the outside lane and holding up traffic.</td>
<td>3.03</td>
<td>1.134</td>
</tr>
<tr>
<td>5.</td>
<td>Someone is driving very close to your rear bumper</td>
<td>2.76</td>
<td>1.187</td>
</tr>
<tr>
<td>6.</td>
<td>Someone cuts in and comes right in front of your motorway.</td>
<td>3.74</td>
<td>1.090</td>
</tr>
<tr>
<td>7.</td>
<td>Someone cuts in and takes the parking spot you have been waiting for.</td>
<td>3.45</td>
<td>1.142</td>
</tr>
<tr>
<td>8.</td>
<td>Someone is driving more slowly than is Reasonable for the traffic flow.</td>
<td>2.42</td>
<td>1.237</td>
</tr>
<tr>
<td>9.</td>
<td>A slow vehicle on a winding road will not pull over and let people pass.</td>
<td>2.62</td>
<td>1.146</td>
</tr>
<tr>
<td>10.</td>
<td>You see a police car watching traffic from a hidden position.</td>
<td>1.82</td>
<td>1.099</td>
</tr>
<tr>
<td>11.</td>
<td>Someone backs out right in front of you Without looking.</td>
<td>2.99</td>
<td>1.173</td>
</tr>
<tr>
<td>12.</td>
<td>Someone coming towards you does not dim their headlight at night.</td>
<td>2.97</td>
<td>1.166</td>
</tr>
<tr>
<td>13.</td>
<td>At night someone is driving behind you with bright lights on.</td>
<td>2.48</td>
<td>1.268</td>
</tr>
<tr>
<td>14.</td>
<td>Someone speeds up when you try to pass them.</td>
<td>2.70</td>
<td>1.173</td>
</tr>
<tr>
<td>15.</td>
<td>Someone is slow in parking and holds up traffic.</td>
<td>2.81</td>
<td>1.171</td>
</tr>
<tr>
<td>16.</td>
<td>You are stuck in traffic jam.</td>
<td>3.28</td>
<td>1.265</td>
</tr>
<tr>
<td>17.</td>
<td>Someone makes up an obscure gesture Towards you about your driving.</td>
<td>3.48</td>
<td>1.232</td>
</tr>
<tr>
<td>18.</td>
<td>You hit a deep pot-hole that was not marked.</td>
<td>3.12</td>
<td>1.201</td>
</tr>
<tr>
<td>19.</td>
<td>A police car is driving in traffic close to you.</td>
<td>2.27</td>
<td>1.223</td>
</tr>
<tr>
<td>20.</td>
<td>Someone beeps at you about your driving.</td>
<td>3.16</td>
<td>1.212</td>
</tr>
</tbody>
</table>
21. Someone is driving well above the speed limit.  | 2.81  | 1.278
22. You are driving behind a truck which has material flapping around in the back.  | 2.84  | 1.295
23. Someone shouts at you about your driving.  | 3.20  | 1.340
24. A cyclist is riding in the middle of the lane and slowing traffic.  | 2.95  | 1.177
25. A police officer pulls you over.  | 2.64  | 1.245
26. You are driving behind a vehicle that is smoking badly or giving off diesel fumes.  | 3.42  | 1.196
27. A truck kicks up sand or gravel on the car you are driving.  | 3.50  | 1.232
28. You are driving behind a large truck and cannot see around it.  | 2.96  | 1.253
29. You encounter road construction and detours.  | 2.65  | 1.172
30. Someone runs a red light or stop sign.  | 2.87  | 1.351
31. Someone is weaving in and out of traffic.  | 3.42  | 1.225

Table 5: Subscale Means of Indian public vehicle drivers Australian Drivers, UK and US Drivers compared to general population in Indore

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Public vehicle Drivers, India</th>
<th>Australia</th>
<th>US</th>
<th>UK</th>
<th>General population in Indore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourtesy</td>
<td>3.27</td>
<td>3.1</td>
<td>3.9</td>
<td>2.7</td>
<td>2.98</td>
</tr>
<tr>
<td>Traffic Obstruction</td>
<td>3.09</td>
<td>2.3</td>
<td>3.3</td>
<td>2.0</td>
<td>3.10</td>
</tr>
<tr>
<td>Hostile Gestures</td>
<td>3.49</td>
<td>2.8</td>
<td>3.2</td>
<td>2.3</td>
<td>3.27</td>
</tr>
<tr>
<td>Slow Driving</td>
<td>2.89</td>
<td>2.3</td>
<td>3.2</td>
<td>2.0</td>
<td>2.60</td>
</tr>
<tr>
<td>Police Presence</td>
<td>2.3</td>
<td>1.9</td>
<td>3.0</td>
<td>1.4</td>
<td>2.24</td>
</tr>
<tr>
<td>Illegal Driving</td>
<td>3.02</td>
<td>2.6</td>
<td>2.7</td>
<td>2.3</td>
<td>3.02</td>
</tr>
</tbody>
</table>

The mean DAS value for all question lied in the range of 3.48(s, d. =1.090) maximum for the question “Someone cuts in and comes right in front of your motorway” to) minimum for the question “You see a police car watching traffic from a hidden position” 1.82(s.d.=11.82)).
Discussion

Alarming rise in death toll due to RTA and serious loss of productive population is of major concern. Hence it is important for the drivers to remain calm and composed while driving, however unpleasant be the situation. This study was conducted on the 200 people (50 students, 50 faculties of MGMMC and 100 people residing around MGMMC in Indore city to find out their driving anger using DAS scale. It was found that the mean DAS score in the selected study population of Indore city was high (2.896).

As expected the mean anger level was found to be less in older age group persons. The driving anger level did vary significantly with age (p-value-0.009).

Surprisingly it was found that the persons not driving during peak traffic hours showed more mean anger level (p-value=0.050) This may be because they were not adapted to the heavy traffic conditions.

Among different subscales Slow Driving, Discourteous Driving, Illegal Driving, Police Presence, Traffic Obstruction and Hostile Gestures, Students of MGM Medical College and General population around MGMMC responded most to Hostile Gesture with mean anger level of 3.63 and 3.271 whereas faculties of MGMMC showed higher level of anger in traffic obstruction (2.97).

On comparison with Previous studies conducted in India on public vehicle drivers and drivers of US,UK and Australia, the results were as follows:

The Australian, U.S. and U.K. study people responded more to discourtesy (3.1, 3.9, and 2.7 respectively) whereas in Indian study people showed more anger towards Hostile Gesture(3.27)(4)(5) The public drivers of Indore had maximal response to hostile gestures which is most responded subscale in the present study also. Surprisingly public drivers had higher mean DAS (3.42) compared to general population (3.27). This may be because of long working hours of drivers as compared to the general population of Indore city.

To avoid the high anger level while driving the people should plan ahead for your regular works- Avoid rush driving; Turn down the loud music while driving; Get proper sleep in preceding night.

Apart from this the government may also take certain steps to reduce the anger level among drivers and general population by taking stringent measures to enforce the already existing legislative measures like higher fines, loss of license, warning letters, and mandatory jail. This will act as an effective barrier towards aggressive driving. Finally we can’t change the road conditions or other drivers, with whom we share the road, but we can change and control our own behavior – we can drive defensively and safely.

Acknowledgment: Authors would like to acknowledge all the respondents for their valuable support

Interest of conflict: None

References


4. An exploration of Australian Driving Anger. Available at