Research Article

Personality correlates of accident-proneness in truck drivers passing by one of the state highway of India

Sudhir Gowda*, Namith Rangaswamy, Harish Bekkalele Rudresh

Department of Community Medicine, Mandya Institute of Medical Sciences, Mandya, Karnataka, India

*Correspondence:
Dr. Sudhir Gowda,
E-mail: dheergowda@yahoo.co.in

ABSTRACT

Background: Over the past years, several efforts are made to establish relationship between personality characteristics and accident proneness with many researchers pursuing to construct accident proneness with personality. Current trend with exponential growth in automobile population has demanded Researchers to study about accident proneness among those drivers. With this background the following study was done with an objective of to explore the personality correlates of accident-proneness of truck drivers passing by State highway-17 of Mandya city in Indian.
Methods: A cross sectional descriptive study was done in SH 17 Bangalore- Mysore highway among 200 truck drivers. The subjects included in the study were the truck drivers who were passing by SH-17 and who were able to understand Kannada or Hindi language. The data was collected by personal interview method by using semi-structured questionnaire for socio-demographic information and standard big five personality test questionnaire for personality trait of drivers.
Results: Out of 200 drivers 126 were accident prone and 74 were non accident prone drivers. Total driving hours in a day was found to be significantly higher in accident prone driver than non-accident prone. With respect to personality it was found that openness to experience and emotional instability/neuroticism was significantly associated with accident proneness.
Conclusions: In conclusion it can be said that personality trait plays an important role in accident. In order to prevent such accident it is advisable to screen such people at the time of issue of driving license for heavy vehicle itself.

Keywords: Personality correlates, Accident proneness, Truck drivers

INTRODUCTION

According to World Health Organization (WHO), nearly 1.3 million people die worldwide every year as a result of RTA this is one person killed every 25 second, while 20 - 50 million suffer non-fatal injuries with many sustaining disability this sums to be the 6th leading cause of death overall and prime cause of death among young people aged 15 - 29 year and cost countries 1-3% of their Gross Domestic Product (GDP), affecting them economically as well.[1-3] In India years 18 - 45 accounted for more than

half (61.2%) of all persons killed in accidents during 2014.[4]

In 2014, total number of RTA cases reported in India being 4,50,898 has increased by 1.8% compared to 2013 with 4,43,001 cases while the deaths have a much concerning increase during 2014 with 1,41,526 deaths by 2.9% compared with 2013 with 1,37,423 deaths.[4] The rate being significant at 51 cases per hour where in 16 persons were killed. The state of Karnataka alone has an

alarming 10,444 deaths with 24 death /100 accidents against national average of 31 deaths.[4]

National Highway which share only 1.58% of total road length accounted for highest RTA contributing 27.5% cases followed by State Highway having share of 3.38% of total road length reported 25.2% cases, fatalities following the same order. Majority of vehicles plying these roads being trucks/lorry, it is important to know that nearly 46.1% of these accidents involve trucks and motorcycles, while deaths reported in accidents involving truck/lorry form a bulk of 28,455 death, weighing 20.1% of total RTA deaths.[4] Without action, road traffic crashes are predicted to result in the death of 1.9 million annually around the globe by 2020.[3]

Driving involve two distinct concepts, driving skills and driving style.[5] The skills Improve on everyday with practice, whereas driving style reflects the individual personal characteristics and attitudes, that is, how a person choose to behave in relation to certain aspects such as speed, traffic rules, the way he treats other traffic participants.[5]

Commercial driving is a cumbersome and hazardous job with sleep deprivation, physical workload and psychological stress, combined with the personality characteristics such as impulsivity, adventurousness, aggressiveness, inability to tolerate authority, mental pre-occupation, poor self-control, emotional release, competitiveness, risk taking, assertive tendencies, being indifferent to right of others, driving for emotional release, tendency to dominate others leads to higher accident proneness.[6] Further person with higher degree of hostility have high attribute to substance addiction, poor education and attitudinal problem which increases chances of accident.[7-9]

Therefore it is important to obtain in depth or deeper understanding of personality and to relate these personality traits in identifying accident prone drivers and initiate measures to reduce RTA. This study was done with an objective to explore the personality correlates of accident proneness of truck drivers in SH-17, Bangalore - Mysore Highway passing by Mandya city, Karnataka.

METHODS

It's a cross sectional descriptive study. Dhabas along SH-17 in Mandya city limits. Male truck drivers who travel along SH-17 and take rest at dhabas in Mandya city limits.

Study period: 2 months

Sample size: 200

Each day list of all truck drivers available in the dhaba is made after applying inclusion and exclusion criteria, and randomly five among them will be selected for the study.

The data was collected for 5 days in a week after obtaining written informed consent between 7 pm to 9 pm at a rate of 5 subjects per day for a period of 2 month from 2nd May 2015 to 2nd July 2015. Interviewing each participant took on an average of about 20-25 minutes. For those who were illiterates, the consent was read out and explained to them in their own language and consent was obtained by taking their thumb impression in the presence of a witness. Sociodemographic and clinical data were collected by using pretested semi-structured questionnaire developed for the study in their language of understanding. Besides the sociodemographic variables, information about minor accidents, average number of accidents per year, vehicle ownership, daily working hours, length of daily driving, alcohol and smoking history and job satisfaction were obtained. Accident prone was defined as history of any major or minor accident. Major accident was defined as causing damage to other vehicles or harm to other person in an accident whereas minor accident was defined as not causing damage to other vehicle or harm to other people.

International personality item Pool (IPIP) or Big Five Personality Test questionnaire which is well validated in Indian population was administered in their language of understanding.[10] The five personality factors were assessed with IPIP questionnaire which consists of 50 items made by Goldberg (Goldberg, 1992). Each factor contains 10 items, each with 5 response options (1 = very innacurate, 5 = very accurate). The first factor, emotional stability consists of items that measure changes in mood states (i.e., am always relaxed, am easily disturbed) and has a Cronbach alpha coefficient of 0.86. The second factor, extraversion is composed of items that asses the degree of sociality (i.e. Am the life of the party, don't talk a lot) having an internal consistency of 0.87. The third factor is openness and measures the degree to which people are interested in new things, abstract ideas and values (i.e. have a rich vocabulary, have difficulty understanding abstract ideas) and has an internal consistency of 0.84. The next factor is agreeableness and it evaluates the extent to which someone is interested in other people, empathetic, attentive to the needs and feelings of others (i.e. Am interested in people, feel little concern for other), with a Cronbach alpha coefficient of 0.82. The last factor is conscientiousness, which measures the degree to which people are organized, follow the rules (am always prepared, leave my belongings around), having an internal consistency of 0.79.[11]

Statistical analysis

All the data was entered in Excel worksheet and statistical Analysis was carried out with SPSS version 19.0. The test of significance used were paired t test and Pearson Co-efficient to be used to assess relationship between driving related variables and personality characteristics.

***Ethical consideration*:** Informed consent taken from the subjects before collection data and Ethical committee approval taken from Institutional Ethical Committee, MIMS, Mandya.

RESULTS

Table 1 summarizes the characteristics of the sample of 200 subjects of whom 126 were accident prone and remaining 74 were non-accident prone.

Both Accident prone and non-accident prone drivers were comparable in terms of age, mean years of driving, marital status, vehicle ownership, job satisfaction, Socio-economic and Educational status. Mean total working hours in a day and Mean distance travelled was significantly higher in accident prone individual than non-accident prone.

Table 1: Characteristics of accident-prone (n = 126) and non-accident prone (n =74) drivers.

Variables	Accident prone(M+S.D)	Non Accident Prone (M+S.D)	t value	p value
Age (years)	39.17+10.81	36.74+10.70	-1.541	0.125
No. of years of driving	18.25+9.90	16.45+9.75	-1.319	0.189
Total working hours in a day	12.01+2.18	10.42+2.04	-1.885	0.041
Total distance travelled in a day (Km)	398.17+98.08	338.78+90.41	-1.389	0.036
	N (%)	**N (%)**	**X^2**	**p value**
Marital status				
Single	16(12.7)	14(18.9)	1.415	0.234
Married	110(87.3)	60(81.1)		
Vehicle ownership				
Own	30(23.8)	18(24.3)	0.007	0.934
Rented	96(76.2)	56(75.7)		
Substance abuse				
Yes	92(73.0)	58(78.4)	0.715	0.398
No	34(27.0)	16(21.6)		
Job satisfaction				
Yes	103(81.7)	65(87.8)	1.287	0.257
No	23(18.3)	9(12.2)		
Socio economic status				
Upper	21(16.7)	8(10.8)	3.168	0.205
Middle	71(56.3)	51(68.9)		
Lower	34(27.0)	15(20.3)		
Education status				
Primary school	7(5.6)	6(8.1)	1.115	0.774
Middle school	32(25.4)	18(24.3)		
High school	71(56.3)	38(51.4)		
College	16(12.7)	12(16.2)		

Table 2: Personality characteristics of accident-prone (N = 126) and non accident-prone (N = 74).

Variables score	Accident prone	Non accident prone	t value	p value
Extrovert	19.42+7.75	19.12+8.34	0.252	0.801
Agreeable	22.98+7.29	22.97+7.04	-0.003	0.998
Conscientious	25.21+8.40	23.82+7.56	-1.165	0.246
Neuroticism	16.75+6.74	17.93+6.44	1.213	0.226
Openness to experience	23.48+6.00	21.69+7.11	-1.967	0.041

Substance abuse was also found to be significantly associated with accident proneness.

Table 2 compares the Personality characteristics of Accident prone (N=126) and Non-accident prone truck drivers (N=74), it was seen that accident prone drivers had Neuroticism trait value of 16.75±6.74 (t=1.213) and (p=0.226), conscientiousness showed a score of 25.21±8.40 (t= -1.165) and (p=0.246) among accident prone drivers against.

23.82±7.56 among non-accident prone drivers, similarly the trait openness to experience was seen to have a score of 23.48±6.00 (t= -1.967) and (p=0.041) in accident prone drivers against 21.69±7.11 among non-accident prone drivers. As expected, there was statistically significant positive association between personality trait of openness to experience and accident proneness, as well as trait factor of Neuroticism or emotional stability showed a statistically significant negative association with accident proneness in coherence with expectation. However trait conscientiousness showed positive association to accident pronenes.

DISCUSSION

This paper aimed to highlight and establish the predictive power of the five personality factors on accident proneness, that is to isolate people who had more than their fair share of accidents to their personality. We investigated the relation between neuroticism, extraversion, openness, agreeableness, conscientiousness and accident proneness among truck drivers taking into consideration the volume of accident statistic they make a part of.

Also, for better understanding of their relation, the study contains information about age, total working hours in a day, total distance travelled in a day, vehicle ownership, substance abuse, job satisfaction, socio-economic status and educational status. However, gender distribution could not be assessed all the truck driver in our setup were Males, as evident in our study where no female truck driver were encountered thus explaining their statistical dominance in accidents as several researchers have concluded that men behave more aggressively in traffic than women.[12]

It is worth mentioning that the drivers working long hours in a day and travelling longer distance had statistically significant association and were more prone for accident proneness inferring the cumbersomeness that commercial driving is associated with and the hazards it carry such as, physical ailments, chronic conditions like body aches, sleep deprivation, great physical workload and psycho-social stress factors.[6] Although several studies implied to us that a poor level of education was related to drivers with higher rate of accident our study does not show any significant association between accident proneness and level of education as majority of the drivers had basic education of middle school and high school while a handful had no formal education at all.[13] Also no association could be established through our

study between socio-economic status and higher incidence of accidents as majority of drivers belonged invariable to middle or lower socio-economic status while only drivers had their own vehicles and were the ones belonging to upper socio-economic class, all the other drivers were either employed at a logistics or had rented vehicles.

Substance use, specifically alcohol, had been associated with higher rates of accident in drivers.[13,14] Our study stood true to establish a significant association between substance use and accident proneness among drivers. Besides tobacco, the most commonly used substance was alcohol. Donovon and Marlatt et al, reported that alcohol using drivers had personality correlates like driving related aggression, competitive speed, sensation seeking, hostility and irritability which contributed towards accident proneness.[14]

Regarding the relation between the personality trait and accident proneness, the personality trait of neuroticism or emotional stability had shown statistically significant negative association with that of accident proneness which is synergistic with expectation as several studies had shown that neuroticism reflecting low stress tolerance, acting out, people prone to sudden dispositional state changes, frustration, flustered or frantic due to traffic congestion, having a driving behavior characterized by the intent to hurt other intentionally, not to co-operate in traffic or to express feeling of superiority while driving were more prone for accidents.[15] The effect size was moderate, nevertheless results of neuroticism were mixed, some researchers stated that although increased anxiety is felt to divert attention from task at hand leading to accidents, other believe neurotic behavior may instead lead to fewer accident because heightened anxiety may contribute to greater concentration.[16] However our study showed negative association between emotional stability/neuroticism and increased risk of accidents. The trait Extraversion, is the pleasure of interacting with others, the tendency to be assertive, sociable, energetic, outward.[17] It was shown by Benfield, Szlenko and Bell et al, that traffic subscales of aggression such as verbal aggression, adaptive and constructive behavior or traffic challenges do not correlate significantly with extraversion.[18] This holds good with our study as well, as there was no significant association established between extraversion and higher incidence of accident. Agreeableness showed no association with accident proneness which was similar to other studies where there was no association between agreeableness and instrumental aggression, anger and enjoyment of violence.[15] Openness is general appreciation of art, emotion, adventure, unusual ideas, imagination and variety of experience. People who are open to experience are intellectually more curious, open to emotion and willing to try new things and more likely to hold unconventional belief.[19] In our study, as expected this

factor was found to have statistically significant positive association with accident proneness.

However, contrary to our expectation was the finding of factor conscientiousness, which is the tendency to show self-discipline, dutifully, aim for achievement against measure or outside expectation, control and regulate their impulses which was shown to have negative relation to physical aggression and verbal aggression manifested while driving by Javonovic et al.[20,21] In our study this factor had a positive association with accident proneness, interesting to note that Arthur and Grazino et al In their study associated conscientiousness with risky driving and Anitie and Chraif et al, established predictability of driving anger with higher score of conscientiousness.[15,20]

CONCLUSION

This paper clarifies some issues in transport psychology showing predictability of accident proneness among truck drivers using the five factor of personality. Demonstrating that emotional stability /neuroticism and Openness to experience were a strong predictor of accident proneness and factors like conscientiousness co-relate to some extent with accident proneness. These traits also influence ones behavior such as substance abuse which in turn has major correlation on its own with accident proneness. Therefore it is possible that causation of traffic accidents is related to personality traits than to the kind of vehicle. Also it can be presumed that screening and isolating people at the place of employment and at the time of issue of driving license for heavy vehicle can prevent untoward incidents such as Road traffic accidents or any other form of violence such as verbal aggression, physical assault, abuse, sexual assault etc.

However the limitation of this study was use of self-report instrument to measure the study variables allowing the issue of social desirability, also study was limited by small sample size, inclusion of male drivers only, which limits the scope of generalization. Also psychiatric morbidity which could contribute towards accident proneness was not screened in this population.

Thus this work leaves room for a sequel in the future and it could be interesting to study and investigate a mediation relation between personality, subscales of aggressive driving behavior as psychiatric morbidity and accident proneness.

ACKNOWLEDGEMENTS

REFERENCES

1. United Nations Decade of action for road safety 2011-2020. Available at: http://www.decadeofaction.org.
2. WHO. Estimates of mortality of causes for WHO members state for the year 2008, summary tables, Geneva; 2011.
3. World Health Organization. Road Traffic Injuries, Fact sheet N[0] 358, March 2013, Available at:http://www.who.int/mediacentre/factsheets/fs358/ens.
4. National Crimes Records Bureau. Accidental deaths and Suicides in India 2014. Available at: http://ncrb.gov.in.
5. Lajunen T. Personality and accident liability: are extraversion, neuroticism and psychoticism related to traffic and occupational fatalities? Pers Individ Dif. 2001;31(8):1365-73.
6. Issever H, Onen L, Sabuncu HH, Altunkaynak O. Personality characteristics, psychological symptoms and anxiety levels of drivers in charge of urban transportation in Istanbul. Occup Med (Lond). 2002;52(6):297-303.
7. Tillmann WA, Hobbs GE. The accident-prone automobile driver; a study of psychiatric and social background. Am J Psychiatry. 1949;106(5):321-31.
8. Panek PE, Wanger EE. Hand test Personality variables related to automotive moving violation in female drivers. J Pers Assess. 1986;50(2):208-11.
9. Trankle U, Gelau C, Metker T. Risk perception and age-specific accidents of young drivers. Accid Anal Prev. 1990;22(2):119-25.
10. Karthikeyan, Srivastava DK. The relationship between the five factors of personality, individual job performance and its components in India. IJARM. 2012;3(1):37-55.
11. Goldberg LR. The development of markers for the Big-Five factor structure. J Psychological Assessment. 1992;4:24-42.
12. Vanlaar W, Simpson H, Mayhew D, Robertson R. Aggressive driving: a survey of attitudes, opinions and behaviors. J Safety Research, 2008;39:375-81.
13. Mangalam MK, Sinha VK, Praharaj SK, Bhattacharjee D. Personality correlates of accident proneness in auto-rickshaw drivers in India. Int J of Occup saf and Ergon. 2013;19(2):159-65.
14. Donovan DM, Marlatt GA. Personality subtypes among driving-while-intoxicated offenders: relationship to drinking behavior and driving risk. J Consult Clin Psychol. 1982;50(2):241-9.
15. Anitei M, Charif M, Vlad B, Teodor M. The big five personality factor in the prediction of aggressive diving behavior among Romanian Youngsters. Int J Traf and Transp Psychol. 2015;2(1).

16. Hansen CP. Personality characteristics of accident involved employees. J Bus Psychol. 1998;2:346-65.

17. John OP, Srivastava S. The Big Five Trait Taxonomy: History, Measurement and Theoretical Perspectives. University of California, Berkley.1999.

18. Benfield AJ, Szlemko JW, Bell PA. Driver personality and anthropomorphic attributions of vehicle personality relate reported aggressive driving tendencies. Person Individ Diff. 2006;42:247-58.

19. McCare RR, Costa PT Jr. Personality in adulthood: A five factor theory perspective, 2nd ed. New-york, Guilford Press. 2006.

20. Arthur JW, Graziano WG. The five factor model, conscientiousness and driving accident involvement. J Person. 1996;64:593-618.

21. Jovanovic D, Lipovac K, Stanojevic D. The effects of personality traits on driving related anger and aggressive driving behavior among Serbian drivers. Transportation Reasearch Part F. 2009;14:43-53.