Vulnerability towards Common Place Stress Reaction of Heavy Bus Drivers with Specific Reference to Public and Private Transport Drivers in the State of Kerala

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Abstract

Master plans to reach determined targets for reducing road accidents are running worldwide. These plans are focused mainly on human factors like stress and psychological states. Drivers and their various work related aspects contributing towards performance and in turn road accidents is an area that has been widely studied. One prominent area of study is the stress level of bus drivers and its influence on performance. Operators of heavy bus drivers perform duties at work that expose them to a variety of risk factors. Bus driving is distinguished as a high strain and high risk job with involvement of physical and mental part of body. This may steer to high accident rates, low productivity of employees and absenteeism. A survey was conducted on a sample of 60 heavy bus drivers to determine extent of their stress during job. The analysis of the study explains the level of stress experienced by heavy bus drivers and its impact on their performance. The relationship of stress with demographic profile, type of bus, bus condition, road condition, rest time, salary, incentives, and working environment are also explored and explained in detail. The study concludes by providing several suggestions, which turns to be beneficial to employee, organisation and society.

Key words : Bus Drivers, Stress Level, Public and Private Transport

Introduction

Bus driving is an occupation having high and conflicting demands (Carrere et al., 1991) and there is a crucial relationship between personal life events and increased accident rates (Legree et al., 2003). Researches show that there is a relationship between stress and unsafe driving (Lagard et al., 2004; Legree, Heffner, Psotka, Martin, & Medsker, 2003; McMurray, 1970; Norris, Matthews, & Raid, 2000). According to various studies, the different psychological factors that control magnitude of stress are control, predictability, time urgency and impedence (Gottholmseder, Nowotny, & Pruckner, 2009; Koslowsky, 1997). Studies also have related anger and aggressive behaviour towards congestion (Shinar & Compton, 2004), where time urgency significantly influences drivers in low and high congestion condition (Hennessy and Wiesenthal, 1999). Stress has an impact on road safety and is also influenced by behaviour of drivers like cognitive lapses, errors and intentional traffic violations (Hartley & Hassani, 1994; Westerman & Haigney, 2000; Wickens, Toplak & Wiesenthal, 2008). Drivers have a high risk of cardiovascular, gastrointestinal and musculoskeletal problems than any other occupations (Winkleby, Ragland, Fischer & schyme 1988) and also have chances for elevated stress related hormones during work (Aronsson &Rissler, 1998). If stress is felt for long time critical health problems like backaches, headaches, gastrointestinal disturbances, anxiety and depression can arise (Johnson, Cooper et al., 2005). Several studies have been conducted in this area which have linked Stress and performance, positively and negatively (Jamal M 2007). The psychological factors that govern magnitude of stress response include time urgency, control, impedense and predictablility. (Gottholmseder,
Nowotny, & Pruckner, 2009; Koslowsky, 1997). Mcmurray (1970) examined crash involvement and traffic violations are high from drivers who are recently divorced. There is a link between life events and crash risk (Legree et al., 2003). Gulan et al (1989) developed a scale that measure vulnerability among drivers and factors influencing stress. Matthews, Desmond, Joyner, Carcary, and Gilliland (1997) redefined this scale to driver stress inventory and five factors influencing stress are aggression, dislike of driving, hazard monitoring, fatigue proneness and thrill seeking. The Driver Stress Inventory (DSI) measures emotional response to driving among drivers (Desmond & Matthews, 2009).

Research question

The main research questions are

- The heavy bus driver's vulnerability towards common place stress reaction among heavy bus drivers in the state of Kerala.
- Comparison of vulnerability towards common place stress reaction among public and private transport bus drivers in the state of Kerala
- The influence of various demographic variables like age, district, education, experience, salary, incentives, colleagues cooperation, type of operating bus, road condition, bus condition and rest time on vulnerability towards common place stress reaction of heavy bus drivers

Theoretical framework

The study focuses on determining the level of stress and its relationship with various demographic factors of heavy bus drivers among public and private transport system of the state of Kerala. The level of stress is identified using the drivers stress inventory framework (Mathew et al 1996) The framework have five variables such as aggression, dislike of driving, hazard monitoring, thrill seeking and fatigue proneness. The study also relates the stress level with various other factors like age, district, education, working time, experience, designation, salary, incentives, team work, duty time, type of operating bus and rest time.

Research Design, Data sources and tool used.

Descriptive Research Design is adopted for the study. Data was collected using the driver stress inventory questionnaire (Mathew et al 1996) which measures the level of stress under five variables like aggression, dislikes of driving, thrill seeking, hazard monitoring and fatigue proneness. A total of 41 questions were included in the study. The inventory used a ten point scale for obtaining information. The research was carried out among drivers from public and private transport system of the state of Kerala. A total of 60 drivers participated in the survey. The data collected were analysed using various statistical tools like ANOVA, t-test and percentage analysis.

Hypothesis

H_0^1: There is no relationship between District and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{2:}$ There is no relationship between Education and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{3:}$ There is no relationship between Age and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{4:}$ There is no relationship between Experience and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{5:}$ There is no relationship between Type of Bus and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{6:}$ There is no relationship between Bus condition and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{7:}$ There is no relationship between Road condition and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{8:}$ There is no relationship between Rest time and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{9:}$ There is no relationship between Schedule and vulnerability towards common place stress reaction among heavy bus drivers.

$H_0^{10:}$ There is no relationship between Colleagues cooperation and vulnerability towards common place stress reaction among heavy bus drivers.

H_0 [11:] There is no relationship between Salary and vulnerability towards common place stress reaction among heavy bus drivers.

H_0 [12:] There is no relationship between Incentives and vulnerability towards common place stress reaction among heavy bus drivers.

H_0 [13:] There is no relationship between Vulnerability towards common place stress reaction among heavy bus drivers of Public transport and Private transport.

Results and Discussion

Vulnerability towards common place stress reaction among heavy bus drivers in the state of Kerala.

Demographic Profile

Sixty Drivers participated in the study where 30 drivers were from public transport system and 30 from private transport system. The table below (Table No:1) shows that 25% of drivers participated in the study are from Pathanamthitta district, 21.7% from Thiruvanathapuram, 21.7% from Kollam, 16.7% from Alappuzha and 15% from Kottayam district. The drivers with SSLC qualification is 48.3% and Plus two qualification is 51.6.Among the respondents, 6.7 % of drivers are from age group of 20-29, 63.3% from age group 30-39, 28.3% from age group 40-49 and 1.7% from 50-59 age group. In the case of experience, 15% of drivers have less than 10 year experience, 60% have experience of 11-20 years and 25% have 21-30 years of experience.

Table No: 1

District	Frequency	Percent	Cumulative Percent
Thiruvanathapuram	13	21.7	21.7
Kollam	13	21.7	43.3
Pathanamthitta	15	25	68.3
Alappuza	10	16.7	85
Kottayam	9	15	100

Total	60	100	
Education			
SSLC	29	48.3	48.3
Plus Two	31	51.7	100
Total	60	100	
Age			
20-29	4	6.7	6.7
30-39	38	63.3	70
40-49	17	28.3	98.3
50-59	1	1.7	100
Total	60	100	
Experience			
<10	9	15	15
11-20	36	60	75
21-30	15	25	100
Total	60	100	

The analysis between district and vulnerability towards common place stress reaction among heavy bus drivers with an f value of 3.819 (P <.05) indicates a strong relationship between the two variables. The vulnerability towards common place stress reaction is high for drivers from districts of Pathanamthitta (4.89) ,Thiruvanathapuram (4.59) and Kollam(4.57) and least for Alappuza (4.44) and Kottayam (4.21) districts. Analysis between education and vulnerability towards common place stress reaction among heavy bus drivers with an t-value of 1.171 (P>.05) indicates no relationship between the two variables. The mean value for drivers with SSLC qualification is high (4.65) and less with plus two (4.51) qualification. The f value between experience and vulnerability towards common place stress reaction among drivers is .444 (P>.05) which indicates no relationship between the two variables. The vulnerability among common place stress reaction among heavy bus drivers is high for drivers with less than

10 year experience (4.71) and least for drivers with experience of 11-20 years (4.55) (Table No: 2).

Table No: 2

District	**Mean**	**Standard deviation**	**F/t**	**Significance value**
Thiruvanathapuram	4.59	.28		
Kollam	4.57	.27	F	
Pathanamthitta	4.89	.55	3.819	0.008
Alappuza	4.44	.40		
Kottayam	4.21	.59		
Total	4.58	.47		
Education				
SSLC	4.65	.57	t	
Plustwo	4.51	.35	1.171	0.246
Total				
Age				
20-29	4.74	.26	F	
30-39	4.58	.48		
40-49	4.51	.48	0.818	0.489
50-59	5.19			
Total	4.58	.47		
Experience				
<10	4.71	.42	F	
11-20	4.55	.47	0.444	0.644
21-30	4.57	.52		
Total	4.58	.47		

Relationship analysis of Vulnerability towards common place stress reaction among heavy bus drivers and type of bus with a t value of -.720 (P>.05) indicates no relationship between the variables. The mean is high for drivers of fast passenger (4.71) and least for drivers of ordinary bus (4.56). Bus condition and vulnerability towards common place stress reaction among heavy bus drivers with t value -.766 (P>.05) and road condition with t value .357(P>.05) indicates both factors have no relationship with Vulnerability towards common place stress reaction. (Table No: 3).

Table No: 3

Type of bus	**Mean**	**Standard deviation**	**F/t**	**Significance value**
Ordinary	4.56	.49	t	
Fast Passenger	4.71	.24	-0.720	0.475
Total				
Bus condition				
Good	4.53	.44	t	
Average	4.63	.51	-0.766	0.447
Total				
Road condition				
Good	4.70	.76	F	
Average	4.55	.46	0.357	0.701
Poor	4.60	.32		
Total	4.58	.47		

The t value between rest time and vulnerability towards common place stress reaction among heavy bus drivers (t= 1.045, P>.05) shows no relationship between the variables. The t value between schedule and vulnerability towards common place stress reaction among heavy bus drivers is -.821(P>.05) which also indicates no relationship between the variables. The t value

between colleagues cooperation and vulnerability towards common place stress reaction among heavy bus drivers is -.112 (P>.05). The result shows no relationship between the variables. The relationship analysis of salary and vulnerability towards common place stress reaction among heavy bus drivers with a t value of-3.518 (P< .05) with mean difference -.39618 and standard error .1162 indicates a relationship between variables. The t value of incentives and vulnerability towards common place stress reaction among heavy bus drivers is 1.068 (P>.05) indicates no relationship between the variables (Table No: 4).

Table No: 4

	Vulnerability	
Factors	t value	Significance value
Rest time	1.045	0.300
Schedule	-.821	0.415
Colleagues cooperation	-0.112	0.911
Salary	-3.518	0.001
Incentives	1.068	0.290

The correlation analysis of vulnerability towards common place stress reaction among public and private transport drivers with an r value of -0.083 (P>.05) indicate no relationship between these sectors. The mean value is high for private transport sector drivers (4.80) and less for public transport sector drivers (4.36) (Table No.5)

Table No: 5

	Vulnerability			
Drivers	Mean	SD	r	Sig Value
Public transport	4.36	.37	-0.083	0.663
Private transport	4.80	.48	-0.083	0.663

Vulnerability among common place stress reaction among public and private transport drivers

The relationship analysis of district with vulnerability towards common place stress reaction among public transport driver (F 4.421, P<.05) and private transport drivers (F 2.285, P<.05) indicates public transport drivers vulnerability towards common place stress reaction have a relationship with district and private transport drivers vulnerability towards common place stress reaction have no relationship. The vulnerability towards common place stress reaction among heavy bus drivers of public transport is high for drivers from Thiruvananthapuram (4.54), Kollam (4.53) and Pathanamthitta (4.50) districts and least for Allapuza (4.22) and Kottayam (3.92) districts. The vulnerability towards common place stress reaction among drivers of private transport is high for drivers from Pathanamthitta (5.15), Alappuza (4.78) and Kollam (4.77) districts and least for Thiruvananthapuram (4.59) and Kottayam (4.58) districts.

The relationship analysis of education with vulnerability towards common place stress reaction among public transport drivers (F -1.012, P>.05) and private transport drivers (F 1.281, P>.05) indicates both category drivers vulnerability towards common place stress reaction have no relationship with education.

The relationship analysis of age with vulnerability towards common place stress reaction among public transport drivers (F .496, P>.05) and private transport drivers (F .353, P>.05) indicates both category drivers vulnerability towards common place stress reaction have no relationship with age. The private transport drivers have high vulnerability (4.36) and less for public transport drivers (4.79).

The relationship analysis of experience with vulnerability towards common place stress reaction among public transport drivers (F .051, P>.05) and private transport drivers (F .154, P>.05) indicates that the vulnerability towards common place stress reaction have no relationship with experience either for public transport drivers nor for private transport drivers (Table No.6).

Table No: 6

	Public				Private			
District	**Mean**	**SD**	**F/t**	**P**	**Mean**	**SD**	**F/t**	**p**
Thiruvanathapuram	4.54	0.27			4.59	0.30		
Kollam	4.53	0.24	f		4.77	0.47	f	
Pathanamthitta	4.51	0.43	4.421	0.008	5.15	0.48	2.285	0.088
Alappuza	4.22	0.33			4.78	0.23		
Kottayam	3.92	0.21			4.58	0.75		
Total	4.36	0.37			4.79	0.48		
Education								
SSLC	4.27	0.41	t	0.32	4.88	0.54	t	0.211
Plustwo	4.42	0.34	-1.012		4.66	0.34	1.281	
Total								
Age								
20-29	4.59	0.16	f		4.90	0.29	f	
30-39	4.37	0.40	0.496	0.614	4.81	0.48	0.353	0.788
40-49	4.30	0.33			4.70	0.54		
50-59					5.19	.		
Total	4.36	0.37			4.79	0.48		
Experience								
<10	4.38	0.40	f		4.89	0.33	f	
11-20	4.38	0.38	0.051	0.95	4.79	0.49	0.154	0.858
21-30	4.32	0.38			4.74	0.56		
Total	4.36	0.37			4.79	0.48		

The relationship analysis of type of bus with vulnerability towards common place stress reaction among public transport drivers (t -.915, P>.05) and private transport drivers (t -.305, P>.05) indicates in public and private sector, type of bus have no relationship with vulnerability towards common place stress reaction among heavy bus drivers.

The relationship analysis of bus condition with vulnerability towards common place stress reaction among public transport drivers (t-.572, P>.05) and private transport drivers (t .018, P>.05) indicates that in both sectors bus condition have no relationship with vulnerability towards common place stress reaction among heavy bus drivers.

The relationship analysis of road condition with vulnerability towards common place stress reaction among public transport drivers (F 2.181, P>.05) and private transport drivers (F.172, P>.05) indicates in both sector road condition have no relationship with vulnerability towards common place stress reaction among heavy bus drivers. (Table No.7)

Table No: 7

Factors	**Public**				**Private**			
Type of bus	**Mean**	**SD**	**F/t**	**p**	**Mean**	**SD**	**F/t**	**P**
Ordinary	4.34	0.38	t		4.79	0.50	t	
Fast Passenger	4.55	0.17	-0.915	0.368	4.88	0.20	-0.305	0.763
Bus condition								
Good	4.33	0.36	t	0.572	4.80	0.41	t	
Average	4.41	0.39	-0.572		4.79	0.54	0.018	0.986
Road condition								
Good	4.23	0.38	f		5.16	0.78	f	
Average	4.30	0.37	2.181	0.132	4.78	0.41	1.72	0.198
Poor	4.60	0.28			4.61	0.38		
Total	4.36	0.37			4.79	0.48		

The relationship analysis between rest time and vulnerability towards common place stress reaction among public transport drivers (t .548, P>.05) and private transport drivers (t .197, P>.05) shows both sector drivers vulnerability towards common place stress reaction have no relationship with rest time.

The relationship analysis between schedule of bus and vulnerability towards common place stress reaction among public transport drivers (t .95, P>.05) and private transport drivers (t-.835, P>.05) indicates both sector drivers vulnerability towards common place stress reaction have no relationship with schedule of bus.

The relationship analysis between cooperation of colleagues and vulnerability towards common place stress reaction among public transport drivers (t-.821, P>.05) and private transport drivers (t .273, P>.05) indicates both sector drivers vulnerability towards common place stress reaction have no relationship with cooperation of colleagues.

The relationship analysis between salary and vulnerability towards common place stress reaction among public transport drivers (t -2.816, P<.05) with a mean difference of-.35247 and standard error of .12517 and private transport drivers (t -1.889, P>.05) indicates public sector drivers vulnerability towards common place stress reaction have a relationship with salary but private sector salary have no relationship with vulnerability towards common place stress reaction.

The relationship analysis between incentives and vulnerability towards common place stress reaction among public transport drivers (t .467, P>.05) and private transport drivers (t .154, P>.05) indicates both sector drivers vulnerability towards common place stress reaction have no relationship with incentives.(Table No.8).

Table No: 8

	Vulnerability			
Factors	**Public**		**Private**	
	t value	**p value**	**t value**	**p value**
Rest time	0.548	0.588	0.197	0.845
Schedule	0.95	0.35	-0.835	0.411
	-0.821	0.419	0.273	0.787

Colleagues cooperation				
Salary	-2.816	0.009	-1.889	0.069
Incentives	0.467	0.644	0.154	0.879

Findings

The age, district, education, experience relationship analysis with drivers shows that only district have relationship between vulnerability towards common place stress reaction among heavy bus drivers in Kerala. This finding opens immense scope for future study. Among public and private transport drivers, public transport drivers vulnerability among common place stress reaction have only relationship with district. The vulnerability towards common place stress reaction is high for private bus drivers and less for public transport drivers.

The type of bus, bus condition, and road conditions relationship with vulnerability towards common place stress reaction among heavy bus drivers indicates no relationship. But the drivers who are driving fast passenger bus have high vulnerability towards common place stress reaction when compared with ordinary bus drivers.

The rest time, schedule, colleagues cooperation, salary, incentives, relationship analysis with drivers shows that these factors except salary have no relationship with vulnerability towards common place stress reaction among heavy bus drivers.

The comparative correlation analysis between vulnerability towards common place stress reaction among heavy bus drivers from public and private transport shows no relationship.

Drivers from Pathanamthitta district possess high vulnerability towards common place stress reaction and drivers from Kottayam district possess high vulnerability towards common place stress reaction. Drivers with SSLC qualification possess high vulnerability possessing high vulnerability towards common place stress reaction when compared to other highly qualified drivers.

The salary and vulnerability towards common place stress reaction among heavy bus drivers have a strong relationship. But the public transport heavy bus drivers have a strong relationship with vulnerability towards common place stress reaction when compared with private heavy bus drivers.

Conclusion

Research was conducted with an objective of identifying vulnerability towards common place stress reaction among heavy bus drivers in Kerala. The study was conducted among 60 drivers from public and private transport drivers by using driver stress Inventory having 10 point scale. The vulnerability towards common place stress reaction of public and private heavy bus drivers were analysed with various statistical tools like ANOVA, t-test and percentage analysis. The vulnerability towards common place stress reaction among heavy bus drivers is related with age, education, district, experience, type of bus, bus condition, road condition, rest time, schedule, co-operation of colleagues, salary and incentives. The district and salary have a strong relationship with vulnerability toward common place stress reaction among heavy bus drivers. Drivers of fast passenger bus, least qualified, less experienced maintain a high vulnerability towards common place stress reaction among heavy bus drivers in public and private transport. Hence drivers with good salary, better qualified persons are preferred for heavy bus driving among public and private transport.

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