SLEEP QUALITY, DECISION MAKING AND PSYCHOLOGICAL WELL-BEING AMONG AUTO-DRIVERS

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ABSTRACT

OBJECTIVE
To investigate the effect of sleep quality on decision making and psychological well-being of auto drivers and to find out the relationship between these variables.

STUDY DESIGN
Correlational design was used in the study.

PLACE AND DURATION OF THE STUDY
The study was conducted within six months in Lahore.

SUBJECTS AND METHODS
Three hundred auto drivers were undertaken in this study and convenient sampling was used for the collection of data. Pittsburgh Sleep Quality Index, Psychological Well-being Scale with Decision-Making Questionnaire and demographic questionnaire were used to assess the variables of study.

RESULTS
Correlational analysis indicated that decision making is negatively correlated with poor sleep quality while it is positively correlated with psychological well-being, while poor sleep quality is significantly negatively correlated with psychological well-being.

CONCLUSION
This study concluded that poor sleep quality decreased the level of decision making and psychological well-being of auto-drivers. The present findings of study are important for auto drivers as it will help them to avoid road or traffic accidents that occur because of poor decision making capacity or poor psychological well-being mainly related with poor sleep quality.

KEYWORDS
Sleep quality, Psychological Well-being, Decision Making, Accidents, Auto-drivers.

INTRODUCTION

Sleep quality is an important factor to maintain healthy lifestyle as well as to maintain good physical and mental health. Sleep quality includes measurement of both qualitative and quantitative components. Quantitative component includes duration of sleep while qualitative component measures satisfaction of the sleep experience and refreshment upon awakening.[1] Sleeping hours of individuals vary among one another and it depends on social context as well as on personal characteristics of an individual.[2] Insufficient sleep duration and poor sleep quality have been associated with several health outcomes like diabetes, inflammation, cardiovascular diseases, neurocognitive function.[3] Poor sleep quality also increases Body Mass Index (BMI), disturbances in level of hormones especially those hormones which regulate hunger and problems related to glucose metabolism.[4] Sleep duration changes with age but it is estimated that adults usually need 7-9 hours of sleep at night but it can vary due to pubertal changes.[5]

Sleep quality of drivers is more effected as their profession seems more demanding and stressful. Sleepiness at workplace especially at night results in poor sleep quality and cause road accidents as it impairs their vigilance and performance while driving.[6] According to latest WHO data published in 2017, the Road Traffic Accident Deaths in Pakistan reached 27,081 or 2.22% of total deaths. The proportion of crashes attributable to sleepiness vary from 1–3% in the US[7] to 10% in France and over 30% in Australia.[8]

A number of previous studies have shown sleep problems among drivers. A study on sleep and mental health among auto drivers has indicated physical and mental health issues as well as psychological distress.[9] Another study conducted in Mumbai identified relationship between quality of life, quality of sleep and work life balance among auto drivers.[10] The results of this study indicated that those auto drivers who spent more time in family than work experience high quality of life and quality of sleep. A study conducted on Iranian drivers showed that sleep problems, early morning awakening, and early insomnia, too warm or too cold atmosphere are common among Iranian drivers with severe road accidents.[11] One UK based study concluded that 16-20% of motor vehicle crashes were sleep related[12] while another study concluded this portion to be 9-10% as per driver's self-report.[13] The importance

of this study is obvious in perspectives of many previous studies.

SUBJECTS AND METHODS

Participants
The study was conducted on three hundred auto drivers at Lahore. The sample was selected on basis of their professional experience and working hours. Convenient sampling was used while recruiting drivers for the study. The mean age of participants was 39.64(SD=9.77) and 50% of the drivers had experience of more than fifteen years.

Instruments
Pittsburgh Sleep Quality Index (PSQI)
To measure sleep pattern of adults Pittsburgh Sleep Quality Index (PSQI)[1] was used. It differentiates "poor" from "good" sleep quality by measuring seven areas. There are total 19 self-rated questions and have Likert scale of 0-3. The PSQI has been shown to be reliable (Interclass correlation, r = 0.87) between test and re-test sessions.[14]

Psychological Well-being Scale (PWB)
To measure psychological well-being of adult Ryff's Psychological well-being scale (PWB)[15] was used. It consisted of 54 items having seven domains. Psychological well-being has internal consistency coefficients ranges between 0.86 and 0.93 and the test-retest reliability coefficients were between 0.81 to 0.88, internal consistency coefficients for Ryff's subscales ranged from α= 0.82 to 0.90.[16]

Decision Making Questionnaire (DMQ)
In the current study DMQ[17] was used in the study. It consists of 21 items and the scores were computed on 6. Cronbach's alpha value of this scale is between 0.83 to 0.90.

Procedure
Permission was taken from authors of original scales and then permission was also taken from authors who had translated the scales in Urdu language. While other scales were translated into Urdu by following MAPI institute (2008) guidelines for Linguistic Validation. Before collecting data participants' informed consent was taken and drivers were briefed about the purpose of research. Participants were ensured that their information will remain confidential and they were explained about the benefits of research and their importance as participants. They were also informed that they had the right to withdraw themselves from the study anytime. Convenient sampling was used while collecting the data. Translated version of scales was given to participants along with demographic questionnaire. It took 25-30 minutes to complete the questionnaires by everyone. For analysis of results, statistical packages for social sciences (SPSS) version 20 was used. Frequencies and percentages of demographic variables was calculated. Correlational and

Regression analysis was done in order to find the relationship between variables.

RESULTS

The Table 1 showed the frequency details of demographic variables with overall sample. The target population had the mean age of 39.64 (SD = 9.77). Three hundred respondents were recruited in the study out of which 62% of the drivers were those who drove up to 12 hours while 26% of the drivers were those who drove more than 12 hours. The results of Table 2 revealed that the reliability analysis of three scales in this research were found in good to excellent ranges of Cronbach's alpha (.82 to .94).

Table 1
Sample characteristics, frequency and percentage (N=300).

Respondent's Characteristics		f (%)	M (SD)
Age			39.64 (9.77)
Education	Primary	16 (5.3)	
	Middle School	66 (22.0)	
	Matric	156 (52.0)	
	Intermediate and Above	62 (20.7)	
Experience	5 years and below	47 (15.7)	
	6 to 15 years	151 (50.3)	
	16 to 25 years	78 (26.0)	
	More than 25 years	24 (8.0)	
Working Hours	12 hours	186 (62.0)	
	More than 12 hours	80 (26.7)	
Types of Vehicle	HTV LTV	166 (55.3)	
		134 (44.7)	

Table 2
Psychometric and descriptive statistics of data (N=300).

Variables					Range	
	K	M	SD	α	Potential	Actual
Decision Making	21	70.97	25.45	.94	21-126	40-124
Sleep Quality	19	27.26	9.09	.82	19-57	35-49
Psychological Well-being	54	193.62	26.23	.82	54-324	120-281

Note. k=number of items; α=reliability; M=mean; SD=standard deviation.

Table 3
Prediction of poor sleep quality on decision making (N=300).

	Decision Making	
Predictors	B	95% CI
Constant	61.28**	[54.25, 68.30]
Age	.35**	[.20, .50]
Experience	1.78**	[.31, 3.24]
Poor Sleep Quality	-.41**	[-.59, -.23]
Subjective Sleep Quality	-.37	[-1.22, .49]
Sleep Latency	1.13	[-.13, 2.39]
Sleep Duration	.02	[-1.54, 1.59]
Sleep Efficiency	-3.85**	[-5.60, -2.11]
Sleep Disturbance	-.15	[-.51, .21]
Use of Sleep Pills	-1.76*	[-3.20. -.31]
Daytime Dysfunction	-.37	[-1.31, .56]
R^2	.24	
F	10.01**	

**p <.01; *p <.05; B for Unstandardized regression coefficient; CI for Confidence interval.

Table 4
Prediction of poor sleep quality on psychological well-being (N=300).

Predictors	Psychological Well-being	
	B	95% CI
Constant	198.916	[182.80, 215.03]
Age	.61**	[.27, .95]
Experience	1.64**	[1.71, 5.00]
Poor Sleep Quality	-1.43**	[-1.85, -1.01]
Subjective Sleep Quality	-3.28**	[-5.25, -1.32]
Sleep Latency	4.12**	[1.24, 7.01]
Sleep Duration	-6.04**	[-9.63, -2.45]
Sleep Efficiency	-10.12**	[-14.12, -6.12]
Sleep Disturbance	-.08	[-.90, .75]
Use of Sleep Pills	-5.06**	[-8.37, -1.74]
Daytime Dysfunction	-1.06	[-3.20, 1.08]
R^2	.30	
F	13.67**	

**p $<$.01; B for Unstandardized regression coefficient; CI for Confidence interval.

Table 3 and 4 showed prediction of age, experience and poor sleep quality with its sub-scales on decision making and psychological well-being. Both Tables depicted that poor sleep quality was found to be significant predictor of decision making and psychological well-being with variance of 24% and 30% respectively. Further, age, experience, poor sleep quality (subscales of poor sleep quality: sleep efficiency and use of sleep pills) found significant impact on decision making and psychological well-being.

DISCUSSION

The current study was aimed to find the effects of sleep quality on decision making and psychological well-being of auto-drivers. Results are in line with previous findings. Previous literature showed that there was negative relationship of poor sleep quality with decision making and psychological well-being. One of the study reported that poor sleep quality cause poor cognitive performance that lead to low decision making.[18] Past studies suggested that decision-making, usually fell under the area of executive purposes, involved many cognitive operations that had been inspected under-conditions of sleep deprivation.[19] Poor sleep quality had been established constantly across researches to be a predictor of psychological distress.[20] Stress can have negative effects on body like loss of sleep at night. Chronic stress causes alternations in brain functions and results in wear and tear on the body known as allostatic load. Chronic stress in animals cause degeneration of neurons of hippocampus and prefrontal cortex, areas involved in memory, selective attention and executive functioning. Thus chronic stress causes effects on decision making, may be accompanied by increased level of aggression and anxiety.[21]

Furthermore, the current study found that poor sleep quality predicted the decision making and psychological well-being among auto drivers. The findings of the current study are in accordance with previous researches. Also one

of the past study[23] described that if the person who had less sleep hour in the last night had less attention with the task that lead the individual to poor ability to make a decision. A report published by Presidential Commission on the Space Shuttle Challenger Accident (1986) also reported that human judgment, decision making power and chance of human error are shifted to work ability. Individuals with poor sleep face effects on the cognitive and decision-making power. One of the study measured the relationship between sleep quantity and quality and measures of health, well-being, and sleepiness showed that in general, health and well-being measures were better related to sleep quality than sleep quantity.[24] Another study conducted on sleep quantity reported that 7-8 hours of sleep at night is positively associated with self-report health status and subjective well-being.[25]

CONCLUSION

The conclusion of the study is that poor sleep quality decreases the level of decision making and psychological well-being. Meanwhile, poor sleep quality is found as predictor of decision making and psychological well-being. Therefore, it is important for auto drivers to maintain their quality of sleep in order to make better decisions and enjoy better psychological well-being, and perhaps further, to avoid road accidents.

REFERENCES

1. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989; 28(2): 193-213.
2. Koo DL, Kim J. The Physiology of Normal Sleep. Hanyang Med Rev. 2013; 33(4): 190–6.
3. Grandner AM. Sleep, Health and Society. Sleep Medicine Clinics. 2016; 12(1): 1-22.
4. Crispim AC, Zalcman Iona, Dattilo M et al. The influence of Sleep and Sleep loss upon Food Intake and Metabolism. Nutr Res Rev. 2017; 20(2): 195-212.
5. Carskadon MA, Vieira C, Acebo C. Association between puberty and delayed phase preference. Sleep. 1993; 16(3): 258–262
6. Braeckman L, Verpraet R, Van Risseghem M, Pevernagie D, De Bacquer D. Prevalence and correlates of poor sleep quality and daytime sleepiness in Belgian truck drivers. Chronobiol Int. 2011;28(2):126–34.
7. Lyznicki JM, Doege TC, Davis RM, et al. Sleepiness, driving, and Motor vehicle crashes. JAMA. 1998; 279(23): 1908-1913.
8. Naughton M, Pierce R. Sleep aponea's contribution to the road toll. Australian and New Zealand Journal of Medicine. 1991; 21(6): 833-834.
9. Lemke M, Yorghos A, Hegeb A, Sönmezc S, Widemand, L. Understanding the role of sleep quality and sleep duration in commercial driving safety. Retrieved from http://dx.doi.org/10.1016/j.aap.2016.08.024
10. Rajesh, Ranjan. A study on Work-Life Balance of Auto Rickshaw Drivers in Mumbai. Journal of Humanities and Social Sciences. 2015; 20(1): 106-111.

11. Mahdi M, Kaveh Najmabadi KA, MF Ghalehbandi, Z Yad Elahi, Banafsheh G, A Sadeghikia. Sleep Quality in Iranian drivers recognized as responsible for severe Road Accidents. Research in Behavioral Sciences. 2008; 6(2): 97-107

12. Horne JA, Reyner LA. Sleep related vehicle accidents. BMJ. 1995; 310: 565-7.

13. Maycock G. Sleepiness and driving: the experience of UK car drivers, Accident Analysis and Prevention. 1997; 29(4): 453-462.

14. Backhaus J, Junghanns K, Broocks A, Riemann D, & Hohagen, F. Test retest reliability and validity of the Pittsburgh Sleep Quality Index in primary insomnia. J Psychosom Res. 2002; 53(3), 737-40.

15. Ryff, C. D. Happiness is everything, or is it? Explorations on the meaning of psychological well-being. Journal of Personality and Social Psychology. 1989; 57(6), 1069-1081.

16. Kale, P. S. (2016). A study of frustration on psychological well-being and emotional maturity among working and non-working women. Retrieved from: http://hdl.handle.net/10603/101157

17. French DJ, West RJ, Elander J, Wilding JM. Decision-making style, driving style, and self-reported involvement in road traffic accidents. Ergonomics. 1993; 36(6): 627-44.

18. Alhola P, Polo-Kantola P. Sleep deprivation: Impact on cognitive performance. Neuropsychiatric disease and treatment. 2007; 3(5): 553–567.

19. Mckenna SB, Dickinson D, Orff JH, Drummond S. The effects of one Night of Sleep Deprivation on known-risk and ambiguous-risk decisions. 2007; 16(3): 245 – 252

20. Taylor DJ, Lichstein KL, Durrence HH. Insomnia as a health risk factor. Behavioral sleep medicine. 2013; 1(4): 227-247.

21. Mcewen SB. Protective and Damaging effects of Stress Mediators: Central role of Brain. Dialogues in Clinical Neuroscience. 2006, 8(4): 367–381.

22. Dinges DF, Kribbs NB. Performing while sleepy: effects of experimentally-induced sleepiness. APA PsycNet. 1991.

23. Schreck KA, Mulick JA, Smith AF. Sleep problems as possible predictors of intensified symptoms of autism. Research in developmental disabilities. 2004; 25(1): 57-66.

24. French DJ, West RJ, Elander J, Wilding JM. Decision-making style, driving style, and self-reported involvement in road traffic accidents. Ergonomics. 1993; 36(6): 627-44.

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