

Correlation of Physical Activity, Depression and Sleep Quality with level of Fatigue Amongst Ambulance Drivers

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ABSTRACT

BACKGROUND: Ambulance drivers in India experience high levels of stress and fatigue, which can negatively impact their mental and physical health as well as their performance on the job. The unpredictable and traumatic nature of their work can lead to psychological injury and social isolation. To prevent medical errors and injuries, it is important to address the fatigue levels of ambulance drivers through counselling and lifestyle changes such as maintaining a healthy diet and exercise regimen. The purpose of this study is to assess the sleep quality and level of fatigue among ambulance drivers in order to better understand and address their occupational stress.

AIM OF THE STUDY: To find out the Physical Activity, Depression and Sleep Quality in ambulance drivers.

To find out the Correlation between 3 variables (Depression, Sleep Quality & International Physical Activity Questionnaire) with level of fatigue in ambulance drivers.

OBJECTIVE OF THE STUDY: To assess physical activity amongst ambulance drivers by using International Physical Activity Questionnaire (IPAQ) in ambulance drivers.

To assess depression amongst ambulance drivers by using Depression, Anxiety and Stress Scale (DASS-21) in ambulance drivers.

To assess sleep quality amongst ambulance drivers by using Pittsburgh Sleep Quality Index (PQSI) in ambulance drivers.

To assess level of fatigue amongst ambulance driver by using fatigue severity Scale (FSS) in ambulance drivers.

To see the Correlation between physical activity (IPAQ) with level of Fatigue in ambulance drivers.

To see the Correlation between depression (DASS-21) with level of Fatigue in ambulance drivers.

To see the Correlation between Pittsburgh sleep quality index (PQSI) with level of Fatigue in ambulance drivers.

METHODOLOGY: Study was approved by the Institutional ethical committee. Total 120 Healthy Ambulance drivers, 120 males were included by convenient sampling. According to inclusion and exclusion criteria data were collected from different hospitals and agency. They were briefly stated the nature of the study. Consent forms were signed by the participants. Demographic data were taken which include basic information like name, age, gender, height, weight, type of job and year of experience. Participants were filled up the scales.

RESULTS: Correlation between Level of fatigue and Level of physical activity was analyzed by Pearson test as the data was normally distributed, $r(118) = -0.170$ shows weak negative and statistically non-significant ($P > 0.01$) correlation. Level of fatigue and Level of depression was analyzed by Pearson test as the data, $r(118) = 0.594$ shows weak positive and statistically significant ($P < 0.01$) correlation. Level of fatigue and sleep quality was analyzed by Pearson test as the data was normally distributed, $r(118) = 0.341$ shows weak positive and statistically significant ($P < 0.01$) correlation

CONCLUSION: In this present study, level of fatigue was not correlation with physical activity, level of fatigue correlation with sleep quality and depression amongst ambulance drivers

KEYWORDS: Physical activity, Depression, Sleep Quality, Fatigue, Ambulance driver

INTRODUCTION

Ambulance drivers were an essential part of the emergency services, providing pre-hospital care to patients in need. However, their demanding job was physically, mentally, and emotionally tiring, with long and irregular working hours [1]. Ambulance drivers, in particular, face difficult working conditions, including carrying dead bodies, staff shortages, and mental demands. They were routinely exposed to traumatic events and human suffering, which could have a negative impact on their mental well-being and performance at work [3]. Overall, ambulance drivers play a crucial role in the healthcare workforce as first responders who provide life-saving medical treatment in emergency situations. However, their job was demanding and requires support to ensure their well-being and ability to provide the best care possible to patients.

PHYSICAL ACTIVITY:

As the use of skeletal muscle to perform a bodily movement, resulting in increased energy expenditure [3]. Ambulance drivers engage in various physical activities such as lifting patients and machines. They were also exposed to contaminants and infectious environments, and might have to deal with aggressive individuals [8]. The high physical activity required in ambulance driving could lead to stressful conditions and potential physiological hazard.

DEPRESSION:

A mood disorder characterized by psychomotor retardation, weight change, insomnia, energy loss, suicidal ideation and depressed mood [3]. According to Rankin T. (2019) the study, depression, a mood disorder diagnosed as major depressive disorder (MDD) if at least five symptoms persist for a minimum of two weeks. These symptoms include depressed mood and loss of pleasure [3]. Ambulance drivers were also

exposed to high levels of noise at work, which could distract or uncomfortable, and might have at higher risk of contracting infectious diseases, which could have psychological effects [8].

SLEEP QUALITY:

An important determinant of physical and mental well-being [3]. Historically, sleep was seen as a passive process, but recent research reveals that poor sleep quality is linked to decrease psychological well-being. Shift workers often experience sleep deprivation, which can contribute to various health problems, including mental health disorders. [1].

FATIGUE: A state of tiredness, effecting both mind and body; where an individual was unable to function at their normal level of abilities [1]. Fatigue has a significant impact on alertness, judgment, mood, and performance, leading to reduced work productivity, performance, and an increased risk of accidents, errors, and injuries [1]. Ambulance drivers might have work full-time, part-time, or 24-hour shifts, and particularly vulnerable to higher levels of fatigue, which can affect both their physical and mental health. This can result in problems within their families, decreased work efficiency, higher accident rates, and reduced attention to duty.

AIM AND OBJECTIVE:

The aim of this study to find out the level of Physical Activity, Depression, Sleep Quality and level of Fatigue in ambulance drivers and to find out the Correlation between 3 variables (Physical Activity, Depression & Sleep Quality) with level of fatigue in ambulance drivers.

SPECIFIC OBJECTIVE:

- To find out level of physical activity amongst ambulance drivers by using

International Physical Activity Questionnaire (IPAQ) in ambulance drivers.

- To find out level of depression amongst ambulance drivers by using Depression, Anxiety and Stress Scale (DASS-21) in ambulance drivers.
- To find out sleep quality amongst ambulance drivers by using Pittsburgh Sleep Quality Index (PSQI) in ambulance drivers.
- To find out level of fatigue amongst ambulance driver by using fatigue severity Scale (FSS) in ambulance drivers.
- To find out the Correlation between level of physical activity (IPAQ) with level of Fatigue (FSS) in ambulance drivers.
- To find out the Correlation between level of depression (DASS-21) with level of Fatigue (FSS) in ambulance drivers.
- To find out the Correlation between sleep quality (PSQI) with level of Fatigue (FSS) in ambulance drivers.

REVIEW OF ARTICLE

1. Saran Sofianopoulos (2011). The exploration of physical fatigue, sleep and Depression in paramedics, A Pilot Study. Conclusions Shift work affects health and well-being both physiologically and psychologically, which translates from work into home. Further research using a larger sample size is warranted to prevent the issues of patient safety, work-related fatigue and the cumulative effects of shift work in paramedic employees[1].
2. Wahaj Anwar A. Khan, et al. (2020). Sleep and Mental Health among Paramedic from Australia and Saudi Arabia: A comparison Study. However, Australian paramedics reported significantly poorer sleep quality and general health in comparison to Saudi paramedics. After removing the effect of driving and working durations, outcomes were no longer significant. The higher burden of depression and PTSD among Saudi paramedics may be explained by

longer hours spent driving and longer work durations reported by this group. Taking into consideration the outcomes reported in this study, more investigations are needed to study their possible effects on paramedics' cognition, performance, and safety [2].

3. Rankin T. (2019). Factors Associated with Anxiety, Depression, Burnout and PTSD in Australia paramedics. Conclusions is Future research should be targeting interventions aimed at improving organisational and operational stress, fatigue, sleep quality, chronic pain and social support to improve anxiety, depression, burnout, and PTSD in Australian paramedics[3].

MATERIALS & METHODS

STUDY OF DESIGN: An observational study.

SOURCE OF DATA: This study was conducted Government, Private Hospital and Private ambulance driver agency at Ahmedabad.

STUDY POPULATION: This study was conducted on Ahmedabad Ambulance Drivers.

SAMPLE DESIGN: Convenience Sampling.

STUDY DURATION: Data was collected over a period of 6 Months.

SAMPLE SIZE: 120 samples were selected on the basis of inclusion and exclusion criteria. Sample size was calculated by using this formula,

$$\text{Sample Size} = 4 \times (\text{SD})^2 / d^2$$

SD of outcomes measure

d= Level of significance 5 %

INCLUSION CRITERIA

Male ambulance drivers with age 26 to 50 years.

Ambulance driver who are working experience minimum 1 to more than 10 years.

Ambulance drivers who are working in private, government hospitals and private ambulance driver agency.

Ambulance drivers who are willing to participate.

EXCLUSION CRITERIA

Ambulance driver diagnosis with metabolic illness.

Ambulance driver diagnosis with any systematic illness.

Ambulance driver diagnosis with anaemia & any type of blood condition.

Ambulance driver diagnosis with any severe mental illness.

Ambulance driver diagnosis with any association with server cardiovascular, neuromuscular & musculoskeletal condition.

Ambulance driver diagnosis with any type of malignant tumours.

METHODOLOGY

After obtaining approval from the Ethical Committee, subjects were evaluated according to the inclusion criteria like age, BMI, year of experience, etc; in total 120 subjects were selected for the study and those who was found to fit into criteria. Written consent form (English & Gujarati) was taken from subjects and brief explanation of proceed was gave to subjects. All subjects filled up the Gujarati version of International physical activity Questionnaire (IPAQ), Gujarati version of Depression, Anxiety, Stress Scale (DASS -21), and Gujarati version of Pittsburgh Sleep Quality Index (PQSI) and Gujarati version of Fatigue Severity Scale (FSS) survey questionnaires. Subjects completed a questionnaire through a paper -based format and study was done. Data were collected from government civil Ahmedabad, Sanjivani Super Specialty Hospital, GCS hospital, SAL hospital, DALK ambulance drivers, Krishan ambulance drivers, GEMS ambulance drivers, etc. Collecting the data and analysis of the study was done. Correlation between level of Physical Activity with the level of fatigue, level of depression with the level of fatigue and sleep quality with the level of fatigue in ambulance drivers. Correlation between level of Physical Activity with the level of fatigue, level of

Depression with the level of fatigue and sleep quality with the level of fatigue in ambulance drivers.

RESULTS

The data was analyzed by Statistical Package Social Science SPSS version 26 and Microsoft office Excel version 2007 used for data storage, tabulation and generation of descriptive statistics. Kolmogorov-Smirnov test was applied to check the normality of data. All qualitative data of this study not followed the normality distribution ($P>0.05$). Although results were derived from Likert-type scales, therefore considered ordinal level data and they were not normally distributed allowing the data to be treated as interval level data. Thus inferential statistics tests where required, were used to compare the differences between age groups, physical activity, depression, sleep quality and fatigue level. Spearman's correlation was used to analyse variables.

DEMOGRAPHICS

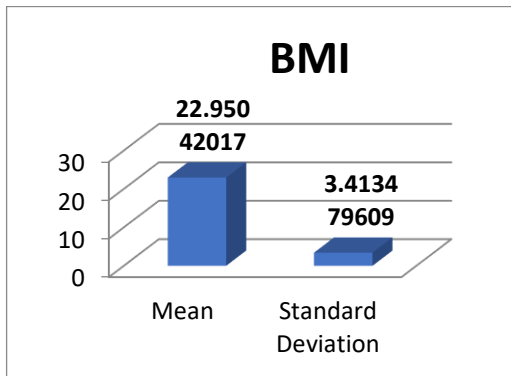
Due to the simplicity and ease of the questionnaires all the returned surveys were able to be used for final analysis (n=120).

Table: 1 Socio-demographic characteristics of the Ambulance Drivers.

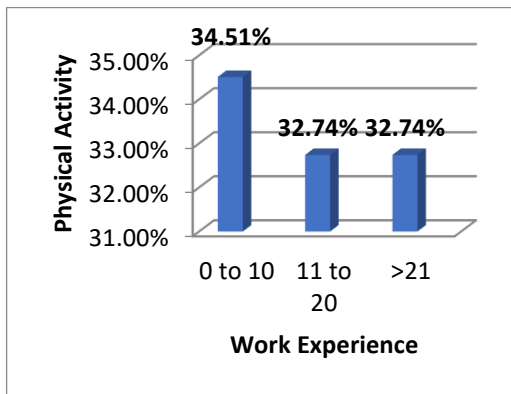
	N	Percentage
Age		
26-30 Years	24	20 %
31-35 Years	24	20 %
36-40 Years	23	19.2 %
41-45 Years	20	16.7 %
46-50 Years	29	24.2 %
Gender		
Male	120	100 %
Marital Status		
Married	111	92.5 %
Unmarried	9	7.5%
Education		
Upper Primary	26	21.7 %
Intermediate	86	71.7 %
Graduate	8	6.7 %
Years of Ambulance Driver Experience		
0-10 Years	74	61.7 %
11-20 Years	32	26.7 %
>20 Years	14	11.6%
Employment Status		
Full-time	90	75 %
Part-time	30	25 %
Job Type		
Private	91	58.3 %
Government	29	41.6 %

Table 2 /Graph 1: Mean BMI of Ambulance Driver.

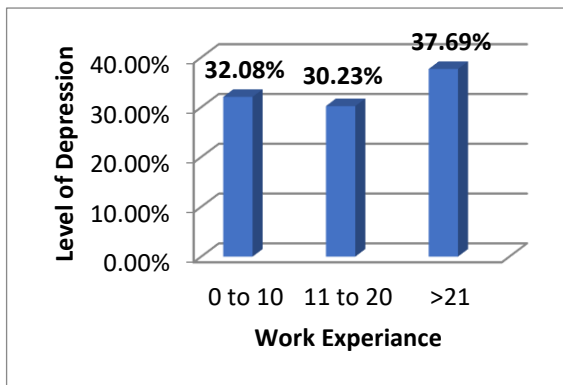
	Mean	SD
BMI	22.95	3.41



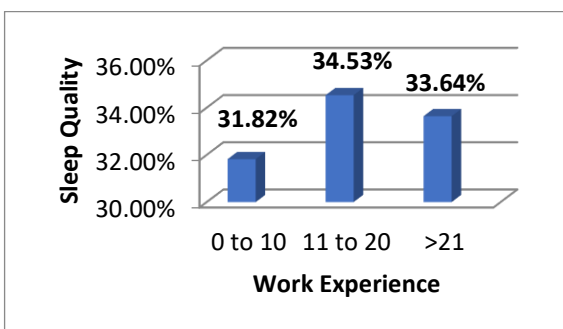
Graph 2: level of Physical Activity & number of work experience



Graph 3: Depression & number of work experience



Graph 5: Sleep Quality & number of work experience



Graph 6: Level of Fatigue & number of work experience

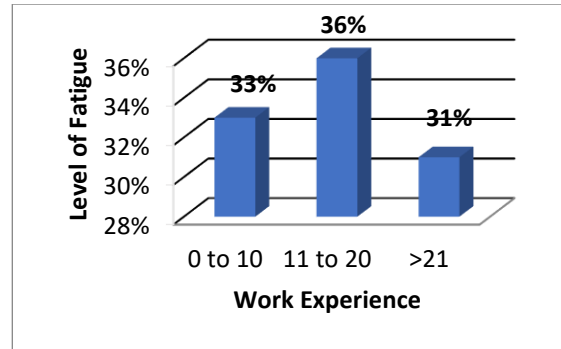


Table 3 / Graph 7: Prevalence of Physical Activity

Level of Physical Activity		
Score	N	Percentage
Higher Physical Activity	116	96.7%
Moderate Physical Activity	4	3.3 %
Lower Physical Activity	0	0%
Total	120	100%

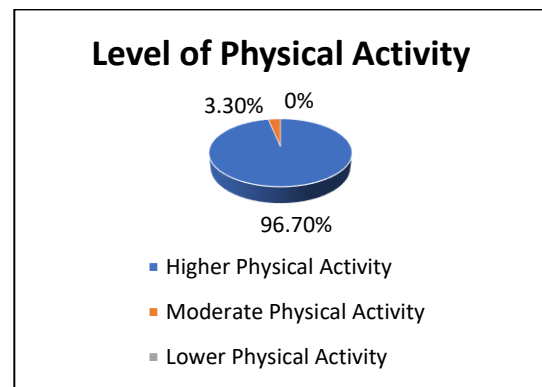


Table 4/Graph 8: Prevalence of Depression level

Level of Depression		
Score	N	Percentage
Normal	53	44.4%
Mild	22	18.4%
Moderate	21	17.7 %
Severel	11	9.4 %
Extremely Severel	12	10.0 %
Total	120	100%

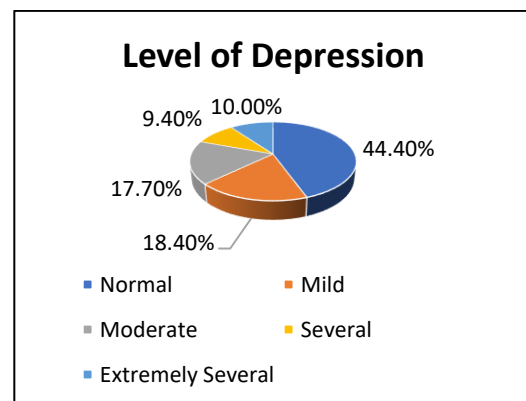


Table 5/Graph 9: Prevalence of Sleep Quality

Sleep Quality		
Score	N	Percentage
0-4 (Good Sleep)	23	19.2 %
5-21 (Poor Sleep)	97	80.8 %
Total	120	100 %

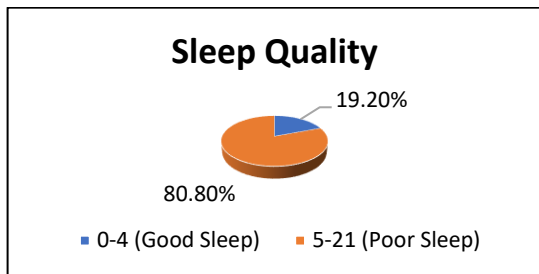


Table 6/Graph 10: Prevalence in Level of Fatigue

Level of Fatigue		
Score	N	Percentage
<36 (Fatigue)	100	83.3%
36 or >36 (Not Fatigue)	20	16.7%
Total	120	100 %

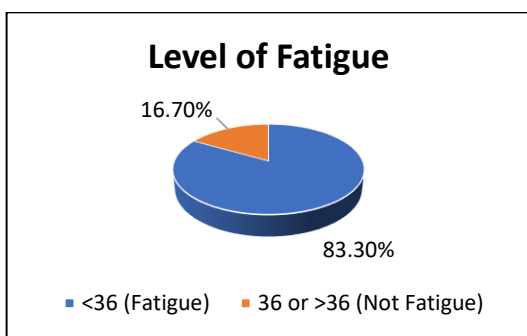


Table 7/Graph 11: Mean & SD of the Ambulance Driver

Descriptive Statistics			
	N	Mean	Std. Deviation
Level of Physical Activity (IPAQ)	120	3203.150	± 1282.5
Level of Depression (DASS-21)	120	9.46	± 7.991
Sleep Quality (PSQI)	120	6.07	± 2.011
Level of Fatigue (FSS)	120	25.98	± 9.835

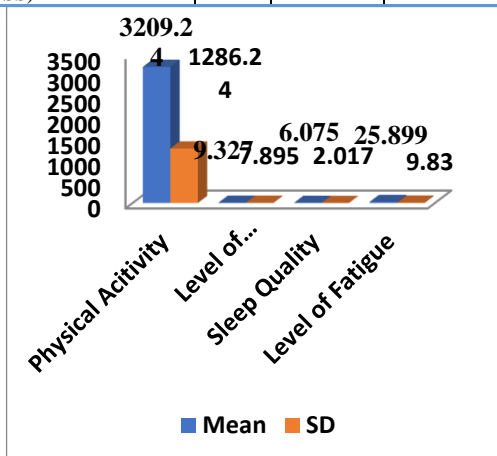
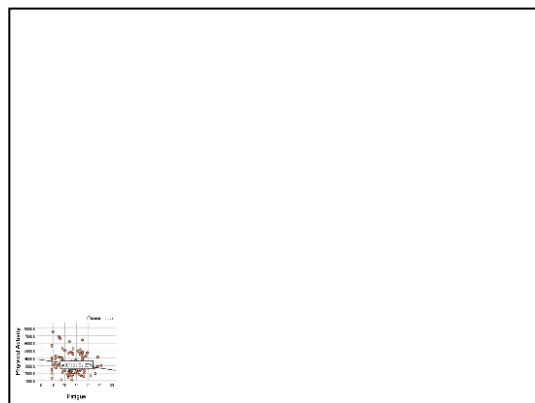


Table 8/Graph 12: Correlation between level of Fatigue & Level of Physical Activity

Correlation		
		Level of Fatigue (FSS)
Level of Physical Activity (IPAQ)	Correlation Coefficient (r)	-0.170
	P- value	0.063**
	N	120

** . Correlation is significant at the 0.01 level (2-tailed).

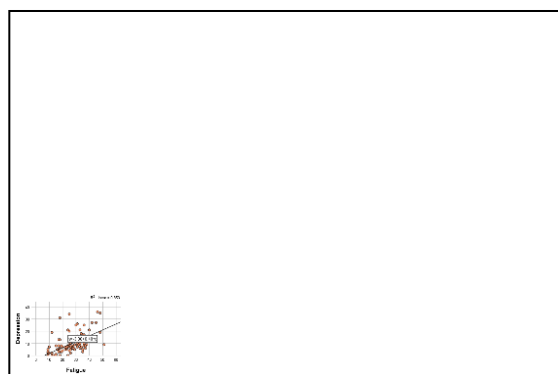


INTERPRETATION: Correlation between Level of fatigue and Level of physical activity was analyzed by Pearson test as the data was normally distributed, $r(118) = -0.170$ shows weak negative and statistically non-significant ($P > 0.01$) correlation.

Table 9/Graph 13: Correlation between Level of Fatigue & Level of Depression

Correlation		
		Level of Fatigue (FSS)
Level of Depression (DASS)	Correlation Coefficient (r)	0.594
	P- value	0.0002**
	N	120

** . Correlation is significant at the 0.01 level (2-tailed).



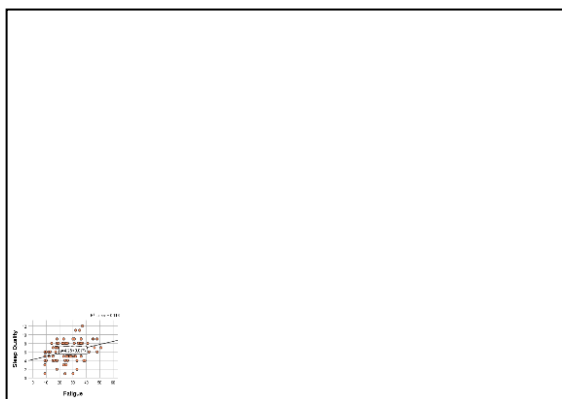
INTERPRETATION: Correlation between Level of fatigue and Level of depression was analyzed by Pearson test as the data was

normally distributed, $r(118) = 0.594$ shows weak positive and statistically significant ($P < 0.01$) correlation.

Table 10/Graph 14: Correlation between Level of Fatigue and Sleep Quality

Correlation		
Sleep Quality (PSQI)		Level of Fatigue (FSS)
	Correlation Coefficient (r)	0.341
	P- value	0.000**
	N	120

** . Correlation is significant at the 0.01 level (2-tailed).



INTERPRETATION: Correlation between Level of fatigue and sleep quality was analyzed by Pearson test as the data was normally distributed, $r(118) = 0.341$ shows weak positive and statistically significant ($P < 0.01$) correlation.

DISCUSSION

The primary purpose of this research was to find out the level of Physical Activity, Depression, Sleep Quality and level of Fatigue in ambulance drivers. The secondary purpose of this research was to find out the Correlation between 3 variables (Physical Activity, Depression & Sleep Quality) with level of fatigue in ambulance drivers. The study included a total of 120 male ambulance drivers, and statistical analysis was conducted using SPSS v. 26 and MS Excel 2007. The mean age of the male ambulance drivers was 39.27 ± 6.50 . Outcomes measures were taken at baseline level of significance was kept at 5%. The study investigated the Correlation between physical activity, depression, sleep quality, and fatigue in ambulance drivers. The findings revealed

non-significant correlations between physical activity and fatigue, depression and fatigue, as well as sleep quality and fatigue (all with p-values greater than 0.05). The weak negative correlation between physical activity and fatigue and However, the weak positive correlations between depression and fatigue, as well as sleep quality and fatigue, did not reach statistical significance. Overall, Results indicate that ambulance drivers who have lower levels of depression; and fatigue, suggesting a positive impact on their physical & mental health.

Physical Activity:

In this present study a result shows that weak negative correlation between level of physical activity and level of fatigue in ambulance drivers. In addition to these Shu-Fen Niu et al., 2011, shows that studies have found that fixed shift workers tend to adapt better and experience less fatigue compared to those working multiple shift. [17] Chantel D. Mayo et al., 2019, in their study find the significant negative relationship between physical activity and fatigue and, indicating that individuals who engaged in more strenuous and frequent physical activity reported fewer issues with fatigue [18]. In this study ambulance drivers did not experience fatigue during their shift work there were less likely to have negative health impacts. They were able to take breaks and, with over 15 years of experience, have adapted to the demands of their work schedule. Despite the difficulties they face, ambulance drivers play a crucial role in providing essential healthcare services to those in needs. In this study, it was discovered that ambulance drivers who work in private jobs experience higher levels of fatigue as compare to government jobs that need to lift heavy objects and patients without the assistance of helpers or nursing staff.

Depression:

In this present study a result shows that weak positive correlation between level of depression and level of fatigue in ambulance

drivers. In addition to these Selma Kaya Aygünoğlu et al. in 2014, shows that fatigue have a positive correlation with depression and fatigue. [20]. In a study by Yun Kyung Kim, et al. in 2015 find that employees who experienced great emotional stress appeared to have high levels of depression, and fatigue was a powerful factor influencing their depression, positive correlation with depression with fatigue. [21]. In this study was found those ambulance drivers with private jobs experience depression due to occupational stress and the lack of availability of helper, nursing staff. They also reported poor sleep quality, depression rate (37%) among ambulance drivers work experience over 20, as they often have thoughts about their post- retirement phase. Some ambulance drivers expressed concerns about the duration of their job and the type of life they lead.

Sleep Quality:

In this present study a result shows that weak positive correlation between sleep quality and level of fatigue and Sleep quality in ambulance drivers. Sylvia Kotterba, et al. in 2018, this study was done to estimate that high prevalence of poor sleep quality among patients and its persistent correlation with fatigue and reduced quality of life over time. They highlight the importance of interventions to improve sleep quality. [22]

CONCLUSION

In this present study, indicate that weak negative Correlation between level of physical activity and level of fatigue among ambulance drivers. However, weak positive Correlation between Level of Depression and Level of fatigue, and additionally, also weak positive Correlation between sleep quality & level of fatigue amongst ambulance drivers.

LIMITATION

One limitation of this study was ambulance drivers were required to leave for duty while in the middle of filling out forms due to the lengthy form process. Second limitation of this study was being more time consuming.

Third limitation of this study that ambulance driver felt exhausted after filling out only a few forms.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: None

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Conflict of Interest: The authors declare no conflict of interest.

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