Prevalence and risk factors for fatigue among health care providers in Qena University Hospitals: A hospital based study

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Abstract

Background: Fatigue is a state of extreme tiredness, weariness, or sleepiness brought on by a lack of sleep, continuous mental or physical effort, or protracted stress or anxiety. Tasks that are tedious or repetitive can make you feel more worn out.

Objectives: To assess the prevalence and the possible risk factors for fatigue in health care worker.

Patients and methods: A cross-sectional study was conducted randomly in Qena University Hospitals on 300 participants. A structured questionnaire among health care workers (HCW) was used as a tool for data collection.

Results: 53% of HCW (79.2% of doctors and 70.3%of nurses) had fatigue. 62.2% of female suffered from fatigue .The significant risk factors for fatigue were sex, marital status, occupation, caffeine intake and smoking. doctors are more prone than other HCW to exhaustion.

Conclusion: Prevalence of fatigue among HCW in Qena university hospitals was high. the most significant risk factors were occupation (doctor), married and caffeine intake .

Keywords: Fatigue; HCW; Qena University Hospitals.
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Introduction

Fatigue is a complicated biological phenomenon that depends on factors such as the amount of time spent awake, the time of day, the workload, one's health, and one's lifestyle while not working. The circadian regularity of sleepiness and the homeostatic urge for sleep are two key biological processes that influence fatigue (**Caldwell et al., 2019**). Give a thorough description of how physical exhaustion affects cognition at the introduction. It's vital to differentiate between physical and mental exhaustion because they arise from distinct causes and present with different symptoms (**Lieberman, 2011**).

High workplace expectations, lengthy duty periods, altered circadian rhythms, social and societal obligations, and inadequate sleep are major contributors to fatigue in modern life (**Sadeghniiat-Haghighi and Yazdi, 2015**). It is a complicated phenomenon that is influenced by the duration of awake time, the time of day, the workload, one's health, and one's lifestyle, both at work and outside of it. For a variety of causes, fatigue is an unavoidable result of modern industrial society. Internal circadian rhythms are frequently negatively impacted by round-the-clock operations, erratic work patterns, and frequent/rapid time zone changes. he quantity and quality of sleep are frequently compromised by short and irregular off-duty periods, long commutes, and unfavourable sleeping conditions. Additionally, there are significant individual variations in both sleep needs and fatigue tolerance, which generally put some people at a higher risk than others. Disorders of the central or peripheral neural systems, as well as various disease states, such as common illnesses including infections, asthma, gastrointestinal problems, and metabolic abnormalities, can result in fatigue and excessive daytime sleepiness (**Guilleminault and Brooks, 2001**).

Like food, water, and air, sleep is a biological requirement. However, unlike breathing, getting enough sleep requires people to participate in volitional behaviours that are influenced by both their own decisions and society expectations. Numerous factors, including genetics, knowledge, attitudes, and ideas about health and disease, can influence how people behave when they sleep. These are a part of a larger social context that also includes the home, the family, the setting in which we sleep, the neighborhood, our job, our socioeconomic status, and many other elements. These variables frequently impede people in the current industrial society from getting enough sleep (**Grandner, 2017**).

In addition to the detrimental effects of sleep deprivation and altered circadian rhythms, exhaustion that impairs cognitive performance can also occur from engaging in tiresome, time-consuming activities like monitoring machinery or piloting highly automated aircraft (**Guo et al., 2016**). Cognitive performance declines in laboratory experiments utilizing tedious, uninteresting activities within 10 minutes or less, and they get worse with time (**Bonnefond et al., 2010; Guo et al., 2016**).

Patients and Methods

The research was cross-sectional in nature. This study was conducted randomly in Qena University Hospitals. Health care professionals participated in a standardised questionnaire survey.

Inclusion criteria: Healthcare workers who have worked shifts continuously for at least the past 12 months Working at least two shifts every day or working nights was considered shift work. Accept to participate in the study

Exclusion criteria: reported mental illnesses, overuse of alcohol or illicit drugs,

caffeine overuse (more than 8 cups of coffee or 16 cups of tea per day).

Data collection: Data were collected during the period from October 2021 to October 2022. We provided all participants with self-administered paper questionnaires. The questionnaires were anonymous. Collection of data included: The questionnaire's first section assessed respondents' demographic information, routines, medical and drug histories, height, weight, and caffeine usage. FSS is a 9-item scale (**Krupp et al.,1989**), that controls the level of fatigue and how it affects daily activities. The components are scored on a 7-point scale with 1 meaning strongly disagree and 7 representing strongly agree. The raw score ranges from 9 to 63 and to calculate final score. Total score is di-vided by question numbers. Final score of 4 or more is fatigue group and less than 4 is non fatigue group.

Ethical consideration: All participants were required to sign a written informed consent form that included a clear statement of the study's objectives. All information gathered was private and anonymous during data analysis. The research was approved by the ethical committee of Qena faculty of medicine. Ethical approval code (SVU-MED-COM009-2-21-8-227).

Statistical analysis

Statistical Package for Social Sciences (IBM SPSS) version 26 was used to analyze the data. Qualitative variable was presented as frequencies and percentages. chi-square test was used for comparison between two qualitative data. Binary logistic regression analysis was used. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, P value < 0·05 is considered significant.

Results

Of the 300 respondents, mean age is 27.2±5, According to sex distribution among participants, 63%ere Females. According to occupation Physicians were 48%, nurses were 39.5%and other HCW were 12.5%. According to BMI 6.7%were underweight, 53% were normal 33%were overweight 7.3% were obese. Fatigue was reported in 53% of HCW and 47% of the studied group had no fatigue (**Table.1**).

Table 1. Distribution of fatigue among health care worker

Fatigue	Non fatigue group	141	47%
	Fatigue	159	53%

37.5% of males suffered from fatigue while 62.2% of female suffered from fatigue with statistically significant difference between the 2 groups (fatigue vs. non fatigue), (p value= <0.001) .The mean age for the group with fatigue was 27.1±2.7 while for the group without fatigue was 27.4±6.7. No significant difference was found regarding marital status, BMI and chronic diseases (**Table.2**).There is statistically significant difference between groups regarding COVID-19 infection, vaccination and occupation .According to occupation, fatigue was significantly associated with doctors (79.2%) followed by nurses (70.3%%).Fatigue was significantly associated with caffeine intake and 100% of HCW drinking more than 5 cups / day were positive for fatigue, (**Table.3**).

Table 2. Distributions of fatigue according to gender, occupation, marital status, age and BMI

Variables		Study groups		P value
		Fatigue group (N=159)	Non fatigue group (N=141)	
Sex	Male	42(37.5%)	70(62.5%)	<0.001**
	Female	117(62.2%)	71(37.8%)	
Age (mean ±SD)		27.1±2.7	27.4±6.7	0.542
Marital status	Single	55(45.5%)	66(54.5%)	0.07
	Married	97(57.4%)	72(42.6%)	
	Divorced	7(70%)	3(30%)	
BMI	Under weight	15(75%)	5(25%)	0.101
	Normal	77(48.4%)	82(51.6%)	
	Overweight	53(53.5%)	46(46.5%)	
	Obese	14(63.6%)	8(36.4%)	
Chronic diseases	Yes	3(100%)	0	0.06
	No	158(53.5%)	138(46.5%)	

Table 3. Distributions of fatigue according to pervious COVID-19 infection vaccination

Variables		Study groups		P value
		Fatigue group (N=159)	Non fatigue group (N=141)	
COVID-19	Yes	71(71.7%)	28(28.3%)	<0.001**
	No	88(43.8%)	113(56.2%)	
Vaccination	No	43(62.3%)	26(37.7%)	0.01*
	Astrazeneca	17(54.8%)	14(45.2%)	
	Sinopharm	27(58.7%)	19(41.3%)	
	Sinovac	50(41%)	72(59%)	
	Pfizer	22(68.8%)	10(31.3%)	
Occupation	Doctor	114(79.2%)	30(20.8%)	<0.001**
	Nurse	83(70.3%)	35(29.7%)	
	Other	10(26.3%)	28(73.7%)	
Smoking	Yes	8(47.1%)	9(52.9%)	0.613
	No	151(53.4%)	132(46.6%)	
Caffeine	Yes	120(65.6%)	63(34.4%)	<0.001**
	No	39(33.3%)	78(66.7%)	
Average intake of caffeine (cup/day)	1-3	82(57.7%)	60(42.3%)	<0.001**
	3-5	38(92.7%)	3(7.3%)	
	≥5	6(100%)	0	

The mean number of night shift/ month associated with fatigue was 10.69±5.6, the mean night shift hours associated with fatigue was 9.9±5.9, the mean number of day shift/ month associated with fatigue was13.2±5.9, mean day shift hours associated with fatigue was10.7±5.5 and the mean working hours / day associated with fatigue was15±8.1. According to pattern of shift 58.5% of successive shifts associated with fatigue while 41.5% of interruptive shifts associated with fatigue, (**Table.4**).

Table 4. Work schedule and fatigue

Variables		Study groups		P value
		Non -fatigue group (N=141)	Fatigue group (N=159)	
No. of night shift/ month		12.22±3.4	10.69±5.6	0.021*
Night shift (hours)		8.3±4.6	9.9±5.9	0.007**
No. of day shift/ month		13.5±3.5	13.2±5.9	0.643
Day shift (hours)		8.5± 4.9	10.7±5.5	<.0001**
No of working hours / day		8.5±4.8	15±8.1	<.0001**
Pattern of shift	**Successive**	75(53.2%)	93(58.5%)	0.356
	Interruptive	66(46.8%)	66(41.5%)	

There is insignificant correlation between age, BMI and fatigue, (**Table.5**).There as strong positive correlation between mean night shift hours ,mean day shift hours , mean working hours per day and fatigue, (**Table.6**).

Table 5. Correlation between fatigue score ,body mass index BMI and age .

Variables	Fatigue score	
	R	P value
Age	0.012	0.841
BMI	0.015	0.802

Pearson correlation

Table 6. Correlation between fatigue score and shift hours

Variables	Fatigue score	
	R	P value
Night shift (hours)	0.473*	<0.001
Day shift (hours)	0.569*	<0.001
No of working hours / day	0.696*	<0.001

Pearson correlation *significant difference ** highly significant difference

Discussion

It is still unclear what causes fatigue, a common and incapacitating sign of neurological illnesses. Despite tremendous effort, little is known about the pathogenic pathways of weariness. This can be the case because there are multiple factors that contribute to weariness. Some probable causes of weariness include The availability or metabolism of substrates, changes in neurotransmitter levels, inflammation,

psychiatric issues, stress levels, and mental health issues**.(Rudroff et al.,2020).**

More than half of our HCW participants expressed significant exhaustion, which was substantially correlated with poor sleep quality as measured by the PSQI and decreases their productivity, increases the likelihood of mistakes, and causes other serious problems. (**Patterson et al.,2018**).

Our results reported that fatigue was more common in female HCWs .Previous studies did not show an affinity for female workers to have poorer fatigue resistance or a certain age range (**Haluza et al.,2016**). The fact that FSS significantly corresponds with depressive symptomatology. (**Corfield et al.,2016**), Young women with important careers sometimes suffer from depression. (**Madsen et al.,2017**).unfortunately we did not assess the depression scale .

There is a substantial relationship between shift duration and weariness and function, according to employment characteristics. Short-duration shifts were found to have a positive effect on staff and patient safety in certain studies, but not in others. (**Shockey et al.,2017**). We find a significant association between hours of work and fatigue and tiredness is linked to night shifts and asymmetrical shift assignments. While previous studies had not found a link between work hours and exhaustion, there was a highly significant correlation between fatigue and night shifts and a patchwork shift pattern (**Tabrizi et al.,2020**).

In our study 57.4%of married participant had fatigue ,79.2% of doctors and 70.3%of nurses were positive for fatigue. It may be generally believed that coupled women who work full-time, especially those with dependents, have less opportunity to recuperate from acute, work-related weariness as a result of the combined workload of paid and unpaid tasks. They consequently have a higher risk of developing maladaptive chronic fatigue, especially if they work shifts. This idea is supported by certain research linking full-time employment to health problems among married mothers (**Edell-Gustafsson et al. 2002)**

Conclusion

The prevalence of fatigue among HCWs working at university hospitals is substantially underrated. These issues could have a significant negative impact on HCWs' health and the standard of patient care. Doctors are more prone than other HCW to exhaustion and stress.

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