Stress, Anxiety and Sleep Disorder among Nurses: A Cross-Sectional Study of Rotation vs Fixed Shift Workers

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Authors' contributions

This work was carried out in collaboration with all authors. Authors NA, HI, MA, VNY, WY, PPMD and YA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors NA, PPMD and YA managed the analyses of the study. Authors HI, MA, VNY and WY managed the literature searches. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: To assess the prevalence of stress, anxiety and sleep disorder among nurses on rotation shift work and those on fixed shift work system.
Design: This study was a cross-sectional study.
Setting: This study was conducted at the Tamale West Hospital in the Tamale metropolis of Ghana,

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from January to April 2017.

Methods: Two hundred and forty-three (243) nurses, consisting of 20 Enrolled Nurses (E/N), 131 Registered Nurses, 62 Nursing Officers (N/O) and 30 Community Health Nurses were recruited for this study. Data were collected through self-administered questionnaires containing socio-demographic data, stress assessment using the Perceived Stress Scale, anxiety assessment using the Kessler Psychological Distress Scale (K10) and sleep disorder assessment.

Results: Sixty-three (63) % of the nurses were found to have anxiety while 83% were found to be stressed. The prevalence of stress was higher among shift workers than fixed workers. Severe stress was higher in rotation shift workers. 20.8% of nurses on shift work had problems sleeping. Duration of sleep was higher among shift workers 6.464±1.195 than fixed workers 6.06±1.391. Nurses who are younger and have not been working for long periods have significantly higher anxiety symptoms than the older nurses. Also, nurses who do not engage in exercise have a significantly higher prevalence of anxiety than those who exercise.

Conclusion: Shift workers showed a higher prevalence of stress as compared to fixed workers, and female nurses were more stressed than the male nurses. Shift workers were having more sleep than attached workers. Anxiety was affected exercise and alcohol as well as the duration of service.

1. INTRODUCTION

Boisard, Cartron [1] reported in their study that only about 24% of the working population is engaged in the so-called 'normal' or 'standard' day work, that is between 07.30 or 8.00 and 17.00 or 18.00 h from Monday to Friday. This means that the vast majority of workers are engaged on 'non-standard' working hours, including shift and night work, part-time work, weekend work, compressed work week, varying working hours, split shifts, seasonal work, on-call work, etc. Organisations and companies in which working hours are extended to evening and night hours have adopted various types of work schedules.

Shift work is one of work hour systems in which a relay of employees extends the period of service beyond the conventional eight-hour working per day [2]. According to Saksvik, Bjorvatn [3] "shift work implies any work organisation of working hour that differs from the traditional diurnal work period". Also, Kawachi, Colditz [4] defined it as work patterns that extend beyond the conventional 8-hour workday and that potentially disrupt workers' normal biological and social diurnal rhythms.

Drake, Roehrs [5] posits that 32% of night workers (majority of shift hours are between 9 p.m. and 8 a.m.) and 26% of rotating shift workers (shifts that change periodically from days to evenings or nights) experienced long-term insomnia and excessive sleepiness and are not able to adapt their sleep appropriately and/or adequately on these shifts. Individuals become sleepier while awake if they experienced sleep loss, and this may exert negative repercussion on the shift worker's ability to perform duties safely and efficiently, both on and off the job [6]. Most investigators theorise that shift work has demonstrably exerted adverse effects on shift workers through disturbances of circadian rhythms, sleep, and social and family life [7,8]. Disturbances in circadian rhythms may bring about decrease in the duration and quality of sleep and may raise the level of fatigue and sleepiness, including psychological, gastrointestinal, and cardiovascular symptoms [9,10]. Again, shift work may exacerbate pre-existing chronic conditions, making it difficult to control symptoms and disease progression. Sood [11] indicates conditions that may be exacerbated by shift work to include: unstable angina or history of myocardial infarction, hypertension, insulin-dependent diabetes, asthma, psychiatric illnesses, substance abuse, GI diseases, sleep disorders, and epilepsy requiring medication. [12] adds to this list chronic renal impairment, thyroid and suprarenal pathologies, malignant tumours, and pregnancy. Furthermore, working at unusual times may render interaction with family and other social relations difficult to maintain [6]. However, while some shift workers are developing health complication as a result of their exposure, others can tolerate it [3], indicating the extent to which people react to potential challenges that come with shift work differently.

The theory of "web of causation" indicates that a collection of risk factors jointly produces a suitable situation that put individuals at risk of disease. In line with this theory, individual ability

to adapt to shift work without adverse consequences depends on many variables including social [13] and cultural factors. For instance, individuals' feelings and satisfaction about both private and social lives could affect their ability to adapt to shift work without adverse consequences. Andlauer, Reinberg [14] explain that shift work tolerance is associated with behavioural and biological dispositions such as digestive troubles, persisting fatigue, stress, anxiety and sleep alterations.

It remains unknown how shift work among nurses affects stress and anxiety levels and total sleep time in this study setting. However, decrease in sleep has been attributed to the increased devotion to work and increased participation in extracurricular activity [15]. Night shift workers tend to sleep less during work days compared to day shift workers in general [16]. Psychological complaints mostly reported among these workers are depression and other mood disturbances, including personality changes, and relationship difficulties [6,17]. Again anxiety, an essential indicator of psychological stress and well-being, normal levels of psychological stress may be healthy. However, too much can be detrimental and can negatively affect daily activities such as social interaction, sleep patterns and work activity. In fact, anxiety disorders have been reported to be more prevalent than any other mental health illness [18].

It is quite appropriate that attention is paid to shift work as a significant feature of sociotechnical systems, which may adversely affect mental and physical health, social life and safety of shift workers. In the medical domain, physicians, nurses and other ancillary staff are expected to be performing their jobs or to be on-call around-the-clock. Studies have shown that a more significant percentage of health service workers are engaged in a shift system than in any other employment sector. Hospitals, the most significant employers in the healthcare field, employ more night shift workers than any other industry [2].

Nurses working in hospitals are the largest group of employees who most often must work in shift work hours. Despite the fact that the majority of shift workers in the hospital are nurses, few studies have assessed the adverse effects of shift work among this group on stress, anxiety as well as a sleep disorder. The study therefore aimed at determining the prevalence of stress, anxiety and sleep disorders among nurses running shift system and those on fixed shift working at the Tamale central hospital in the Tamale metropolis.

2. MATERIALS AND METHODS

2.1 Study Area

This study was carried out in Tamale Central Hospital in the Tamale Metropolis in the Northern Region of Ghana. Tamale Central Hospital provides 24hour service and currently has approximately 319 staff nurses and has six functional wards comprising children's, female, male, labour, maternity and emergency ward.

2.2 Study Design

A cross-sectional study design was used in conducting this study. Cross-sectional design allows the researcher to obtain data at one spot in time and also obtain data from groups that are comprised of different ages or different stages of development.

2.3 Study Population

A total of 243 nurses which comprised, 20 Enrolled Nurses (E/N), 131 Registered Nurses, 62 Nursing Officers (N/O) and 30 Community Health Nurses working in the Tamale central hospital were recruited for the study.

2.4 Sample Size Determination

The sample size was calculated using the [19] formula for a point estimate sample. Estimated prevalence of stress among nurses is 17.4% [20]. The sample size was, therefore, calculated from the expression:

$$n = \frac{p(1-p)t^2}{m^2}$$

Where,

n= required sample size
t= confidence level at 95% (standard value of 1.96)
p= estimated prevalence of stress among nurses as 17.4%.
m= margin of error at 5% (standard value of 0.05)
Using the information in the formula above the sample size for our study was 221 persons. A

10% allowance was made for non-response, withdrawal from the study and damaged questionnaires culminating into a final sample size of 243 nurses.

2.5 Data Collection Procedure

2.5.1 Pretesting of questionnaires

In order to clear all uncertainties and any ambiguity, 20 questionnaires were pretested at the Tamale Central Hospital in order to change the instructions that were not clear to the participants. The categories of participants include; Registered Nurses, Nursing Officers, Community Health Nurses and Enrolled Nurses.

2.5.2 Administering of questionnaires

A simple random sample was used in selecting study participants for questionnaire administration. A questionnaire targeting permanent nurses of the hospital was designed as the main instrument for collecting data. To address the aim of the study, both qualitative and quantitative data needed to be collected, as such both open ended and close ended questionnaires were deployed.

The questionnaire was organized into four sections: The first section comprises items that solicited information on the socio-demographic features of the study participants. The second and third sections contained stress and anxiety assessment respectively. While the fourth section consisted of the sleep disorder assessment of the study participants. In this section also, some open-ended questions relating to the hours of sleep the participants had on the average as well as whether or not the participants got enough sleep after their shift and reason for their answer were asked.

2.5.2.1 Part I: Socio-demographic Data

This part was concerned with the socio-demographic data of the study participants such as age, gender, marital status, duration of working as a nurse, educational level.

2.5.2.2 Part II: Stress scale

The scale in this part of the questionnaire was developed based on the Perceived Stress Scale (PSS). The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to determine how unpredictable, uncontrollable, and overloaded respondents find their lives.

The scale also includes a number of direct queries about current levels of experienced stress. The PSS was originally designed for use in community samples with less formal education. The items are easy to understand, and the response alternatives are simple to grasp. Moreover, the questions are of a general nature and hence are relatively free of content specific to any subpopulation group.

The questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents were asked how often they felt a certain way. PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items [21].

2.5.2.3 Part III: Anxiety Scale

We adopted the Kessler Psychological distress scale developed by Kessler and Mroczek, School of Survey. Research Center of the Institute for Social Research, University of Michigan in 1994. The items in the K10 questionnaire, just as others which measures psychological distress in the most recent 4 weeks, focus on anxiety and depression. The scale used a five-value response option for each item on the scale, from: all of the time, most of the time, some of the time, a little of the time, to none of the time – and were scored from five through to one.

2.5.2.4 Part IV: Sleep Disorder Assessment

The aim of this part was to determine on average the hours of sleep each of the study participants have, if their shift had any effect on their sleep pattern and also the strategies used by workers to help them stay active throughout the working period.

2.6 Statistical Analysis

Data was analyzed using MS Excel (2013 edition) and Graph Pad Prism to obtain plotted graphs and tables that were used to generate reason and proof as well as recommendations. Analysis was conducted quantitatively unsing descriptive and inferential statistics and results displayed using graphs and tables. Chi square analysis was used to compare categorical

variables and a p-value of 0.05 was considered statistically significant.

3. RESULTS

3.1 General Characteristics of The Study Participants Stratified by Gender

In all, 243 subjects participated in the study. Out of this number, 116(47.74%) were males and 127(52.26%) were females. The mean ± s.d. age of the studied population was 29.82±4.160. More than half of the studied population were married (53.91%). Majority of the population were on shift work (51.44%). When the study population was stratified based on gender, there were more single males than females (p=<0.01) whiles there were more married females than males (p<0.01). There were also more females on shift work than males with a p-value of <0.01. The intake of alcohol, energy drink and engaging in exercise respectively was significantly higher in males than in females (Table 1).

3.2 General Characteristics of the Study Population Stratified by Work System

From table 2, participants on fixed work were older than those on shift work, but this was not statistically significant. Significantly higher proportion of males were fixed workers as compared to the females (p = <0.01) whiles a higher proportion of the females were shift workers as compared to the males (p = <0.01). More fixed workers were single (47.46%) whiles more shift workers were married (56.0%). Also, there were more certificate holders (25.42%) on fixed work than on shift work whiles there were more diploma (55.20%) and degree holders (28.80%) on shift work. However, these were not statistically significant.

3.3 Distribution of Stress and Anxiety Stratified by Gender

Table 3 shows that few of the participants had low stress levels (16.87%) whiles more of them had normal anxiety levels (36.63%). However, this was not statistically significant. The mean ± s.d. stress score of the study participants was 17.77±4.88 whiles that of anxiety was 22.91±7.65. Furthermore, majority of the female participants were reported as having high stress and anxiety levels than their male counterparts. However, in relation to hours of sleep reported, the females had more sleep than their male

counterparts. These findings were however, not statistically significant.

3.4 Distribution of Stress and Anxiety Stratified by Work System

As shown in Table 4, moderate levels of stress were recorded more in shift workers (81.60%) than in fixed workers (79.66%). More fixed workers were normal on anxiety than shift workers. There were also more shift workers with anxiety than fixed workers which were classified as mild, moderate and severe representing (25.60%), (23.20%) and (17.60%) respectively for shift workers and (23.73%), (19.49%) and (16.95%) respectively for fixed workers. Shift workers were also found to have longer hours of sleep as compared to fixed workers. However, these differences were not statistically significant.

3.5 Distribution of Stress and Anxiety Stratified by Gender and Work System

As shown in Fig. 1, Majority of the study participants had some form of anxiety. The prevalence of anxiety among the male participants was not significantly different (p = 0.79) from that of the females. Majority of the study participants were stressed and the prevalence of stress among the females was not significantly different (p = 0.73) from that of the males. Furthermore, with regard to the work system, more shift workers were found to be anxious than fixed workers and were more stressed than fixed workers, this was however not significant.

3.6 General Characteristics of the Studied Population Stratified by Stress

From table 5, participants with stress were older (29.87±4.330 years) than those with no stress (29.59±3.225 years). More than half of the participants with stress were married (54.95%), had developed a health condition (52.48%) and were diploma holders (55.45%). Also, participants with stress slept more than those with no stress. This was not statistically significant.

3.7 General Characteristics of the Studied Population Stratified by Anxiety

As shown in table 6, participants with anxiety were younger (29.36±4.109 years) than those

Table 1. General characteristics of the study participants stratified by gender

Variable	Total (n=243)	Male (n=116)	Female (n=127)	P Value
Age	29.82±4.160	30.13±3.789	29.54±4.468	0.274
Marital Status				
Single	110(45.27%)	67(57.76%)	43(33.86%)	<0.01
Married	131(53.91%)	48(41.38%)	83(65.35%)	<0.01
Cohabitation	2(0.82%)	1(0.86%)	1(0.79%)	0.95
Duration	4.116±2.404	4.2±2.348	4.039±2.461	0.61
Shift Work				
Yes	125(51.44%)	46(39.66%)	79(62.20%)	<0.01
Health				
Yes	17(7.0%)	6(5.17%)	11(8.66%)	0.29
Smoking				
Yes	0	0	0	-
Alcohol				
Yes	21(8.64%)	17(14.66%)	4(3.15%)	<0.01
Energy drink				
Yes	98(40.33%)	62(53.45%)	36(28.35%)	<0.01
Exercise				
Yes	148(60.91%)	83(71.55%)	65(51.18%)	0.001
Education				
Certificate	50(20.58%)	17(14.66%)	33(25.98%)	0.03
Diploma	131(53.91%)	68(58.62%)	63(49.61%)	0.16
Degree	61(25.10%)	30(25.86%)	31(24.41%)	0.79
Masters	1(0.41%)	1(0.86%)	0(0.0%)	0.29

with no anxiety (30.62±4.149 years). Duration of work among participants with no anxiety (4.719±2.301) was significantly higher (p = 0.003) as compared to those with anxiety (3.76±2.396). There was not a significant relationship (p = 0.05) in the hours of sleep between participants with anxiety (6.571±1.045) and those with no anxiety (6.169±1.510).

3.8 Sleep Practices among Shift Nurses

From Table 7, a higher proportion of the study participants were having enough sleep (64%). Majority of the participants listened to music to induce sleep (47.2%) whiles more than half of them preferred to walk around to help them stay awake (60%).

4. DISCUSSION

Shift work is one of work hour systems in which a relay of employees extends the period of service beyond the conventional eight-hour working day (Harrington, 2001). According to Saksvik, Bjorvatn [3] "shift work implies any work organization of working hour that differs from the traditional diurnal work period". The aim of this study was to assess the prevalence of stress, anxiety and sleep disorder among nurses on shift work and those on fixed work.

The prevalence of anxiety among nurses from this study was 63%. This figure is higher than the prevalence reported by Rodrigues Costa Schmidt, Aparecida Spadoti Dantas [22], who conducted a study in Brazil and found that the prevalence of anxiety among nursing professionals working at surgical units was 31.3%. In another study conducted in Greece by Stathopoulou, Karanikola [23] among 213 nursing staff to investigate the prevalence of anxiety and stress symptoms among emergency nursing personnel using the Hamilton anxiety scale, the authors reported that 10.7% had very severe anxious mood. The differences in reported prevalence of anxiety in our study and that of others might be explained by the use of different survey tools. Again, the differences could be as a result of the differences in sample sizes of the other studies compared to this study. In addition, ours was conducted among all staff nurses working in all units in the hospital. An assessment of the prevalence of sleep disorder found about 21% of shift workers had problems sleeping. Our finding is consistent with those found by Ohayon, Lemoine [24] who reported

Table 2. General characteristics of the study population stratified by work system

Variable	Shift work (n=125)	Fixed work (n=118)	P Value
Age	29.44±4.075	30.23±4.227	0.14
Gender			
Male	46(36.80%)	70(59.32%)	<0.01
Female	79(63.20%)	48(40.68%)	<0.01
Marital Status			
Single	54(43.20%)	56(47.46%)	0.51
Married	70(56.0%)	61(51.69%)	0.50
Cohabitation	1(0.80%)	1(0.85%)	0.97
Duration of Service	3.96±2.588	4.28±2.180	0.30
Health Condition			
Yes	11(8.80%)	6(5.08%)	0.26
Smoking			
Yes	0	0	
Alcohol			
Yes	7(5.60%)	14(11.86%)	0.08
Energy drink			
Yes	51(40.80%)	47(39.83%)	0.88
Exercise			
Yes	70(56.0%)	78(66.10%)	0.11
Education			
Certificate	20(16.0%)	30(25.42%)	0.07
Diploma	69(55.20%)	62(52.54%)	0.68
Degree	36(28.80%)	25(21.19%)	0.17
Masters	0(0.0%)	1(0.85%)	0.30

Table 3. Distribution of stress and anxiety stratified by gender

Variable	Total (n=243)	Male (n=116)	Female (n=127)	P Value
Stress Score	17.77±4.877	17.28±4.791	18.21±4.931	0.14
Stress Category				
Low	41(16.87%)	21(18.10%)	20(15.75%)	0.62
Moderate	196(80.66%)	95(81.90%)	101(79.53%)	0.64
Severe	6(2.47%)	0(0.0%)	6(4.72%)	0.02
Anxiety Score	22.91±7.650	23.13±7.621	22.7±7.701	0.66
Anxiety Category				
Normal	89(36.63%)	41(35.34%)	48(37.80%)	0.69
Mild	60(24.69%)	32(27.59%)	28(22.05%)	0.32
Moderate	52(21.40%)	21(18.10%)	31(24.41%)	0.23
Severe	42(17.28%)	22(18.97%)	20(15.75%)	0.51
No. of Hrs. of Sleep	6.269±1.307	6.147±1.294	6.381±1.314	0.17

20.1% prevalence and consequences of sleep disorders in a shift worker population.

In contrast to several studies from around the world where prevalence of stress and anxiety have been reported among rotation shift workers as compared to fixed shift workers [2, 6, 17] this study found no significant differences in the prevalence of stress and anxiety between the two groups under study. It is noteworthy that though the prevalence of stress and anxiety were higher among the shift workers, the differences were not statistically significant. This may be attributable to the presence of other factors which together raised the prevalence of stress and anxiety among both groups. Notable among these are the workload during the day shifts coupled with a low nurse to patient ratio especially during the day. Rotation shift workers are however confronted by lesser workload especially during the afternoons and nights but may be faced with a disturbance in the sleep

Table 4. Distribution of stress and anxiety stratified by work system

| Variable	Shift Work (n=125)	Fixed Work (n=118)	P Value
Stress Score	18.18±4.429	17.34±5.295	0.18
Stress Category			
Low	19(15.20%)	22(18.64%)	0.47
Moderate	102(81.60%)	94(79.66%)	0.70
Severe	4(3.20%)	2(1.69%)	0.45
Anxiety Score	23.17±7.701	22.63±7.619	0.58
Anxiety Category			
Normal	42(33.60%)	47(39.83%)	0.31
Mild	32(25.60%)	28(23.73%)	0.74
Moderate	29(23.20%)	23(19.49%)	0.48
Severe	22(17.60%)	20(16.95%)	0.89
Number of hours of sleep	6.464±1.195	6.06±1.391	0.02
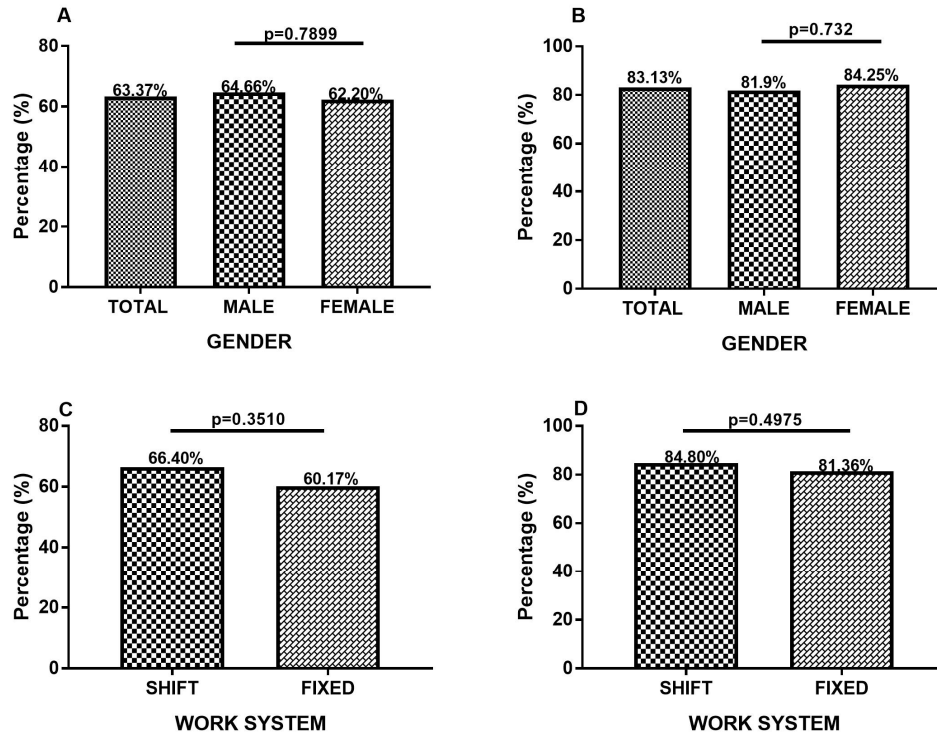
Fig. 1. Distribution of stress (B&D) and anxiety (A&C) among studied population stratified by Gender (A&B) and Work System (C&D)

pattern which could also result in the stress and anxiety. Thus, resulting in a similar trend of stress and anxiety among both groups.

On the contrary however, the prevalence of stress as found in this study was higher than the 10% reported by Al-Hussein and Al-Mteiwty [25].

This difference in prevalence could be because of the use of different survey tools than what was used in this study and the fact that their research was conducted in seven different teaching hospitals in Mosul city. Furthermore, this study found severe stress to be higher among females, which is consistent with those reported by

Dugan, Lauer [26] who in their study compared the levels of stress among women working in hospitals and other salaried workers. The authors reported that women working in hospitals were exposed to a higher level of stress due to their duty schedules. This could be attributed to the fact that most of the women are on shift work. Ajmera, Satia [27] in their study reported that employees working in rotating shifts exhibited higher stress level as their work hours kept changing after a certain duration disturbing circadian rhythm every time.

The duration of sleep among shift workers was found to be significantly higher than that of fixed workers. This finding is not compatible with reports by Åkerstedt [28] who reported that shift workers have lesser sleep and so report more sleep disturbances than day workers. The author also reported that insufficient sleep is often the reason for leaving shift work [28]. Again, Gold, Rogacz [29] in their study reported that nurses

on a rotation system and night nurses reported fewer hours of sleep than day/evening nurses.

This study further found that the presence of anxiety was significantly associated with age and duration of work. This finding could be attributed to the fact that the older nurses who have been working for longer periods have over the years been able to adjust to the workload and the pressure that comes with it. They may have been able to come up with strategies to enable them cope with the working environment which might not be so for the young nurses and nurses who have not been working for long. Therefore, the younger nurses may need more attention in counselling and anxiety management strategies compared to older nurses.

The study also revealed that participants who exercise are less likely to develop anxiety as compared to those who do not exercise. This finding is similar to that by Abbas, Abu Zaid [30]

Table 5. General characteristics of the studied population stratified by stress

Variable	No Stress (n= 41)	Stress (n=202)	P Value
Age	29.59±3.225	29.87±4.330	0.69
Marital Status			
Single	20(48.78%)	90(44.55%)	0.62
Married	20(48.78%)	111(54.95%)	0.47
Cohabitation	1(2.44%)	1(0.50%)	0.21
Duration	4.195±1.965	4.094±2.485	0.81
Shift Work			
Yes	19(46.34%)	106(52.48%)	0.47
Health Condition			
Yes	19(46.34%)	106(52.48%)	0.47
Smoking			
Yes	0(0.0%)	0(0.0%)	
Alcohol			
Yes	3(7.32%)	18(8.91%)	0.74
Energy Drink			
Yes	19(46.34%)	79(39.11%)	0.39
Exercise			
Yes	30(73.17%)	118(58.42%)	0.08
Education			
Certificate	10(24.39%)	40(19.80%)	0.51
Diploma	19(46.34%)	112(55.45%)	0.27
Degree	11(26.83%)	50(24.75%)	0.78
Masters	1(2.44%)	0(0.0%)	0.03
Enough Sleep			
Yes	27(65.85%)	130(64.36%)	0.85
No. Hrs. of Sleep	6.244±1.200	6.274±1.330	0.90

Table 6. General characteristics of the studied population stratified by anxiety

Variable	No Anxiety (n=89)	Anxiety (n=154)	P Value
Age	30.62±4.149	29.36±4.109	0.02
Marital Status			
Single	37(41.57%)	73(47.40%)	0.38
Married	51(57.30%)	80(51.95%)	0.42
Cohabitation	1(1.12%)	1(0.65%)	0.69
Duration	4.719±2.301	3.76±2.396	0.003
Shift Work			
Yes	42(47.19%)	83(53.90%)	0.31
Health Condition			
Yes	5(5.62%)	12(7.79%)	0.52
Smoking			
Yes	0(0.0%)	0(0.0%)	-
Alcohol			
Yes	13(14.61%)	8(5.20%)	0.01
Energy drink			
Yes	33(37.08%)	65(42.23%)	0.43
Exercise			
Yes	62(69.66%)	86(55.84%)	0.03
Education			
Certificate	14(15.73%)	36(23.34%)	0.16
Diploma	47(52.81%)	84(54.55%)	0.80
Degree	27(30.34%)	34(22.08%)	0.15
Masters	1(1.12%)	0(0.0%)	0.19
No of Slp	6.169±1.510	6.571±1.045	0.05
Enough Sleep			
Yes	59(66.29%)	98(63.64%)	0.68

who reported that nurses who are practising physical exercise are less likely to have anxiety symptoms compared to those who are not practising physical exercise. It is also similar to findings by Sexton, Mære [31], who found comparable reductions in general anxiety for participants who exercised by jogging and those who participated in light walking. The authors speculated that some minimum amount of physical activity might be biologically necessary to keep anxiety at healthy levels. The study also revealed that alcohol consumption was higher among nurses with no anxiety. This is in contrast to reports by Haynes, Farrell [32] who in their study on alcohol consumption as a risk factor for anxiety and depression reported that irrespective of the method used to classify alcohol consumption, those who had not drunk alcohol in the previous 12 months were significantly less likely to have anxiety.

The findings in this study is however limited by the fact that the stress and anxiety, as well as sleep disorders, were assessed based on self-reported questionnaires. This could result in answers that may not necessarily reflect that actual state of the individuals involved. Also, the standardised questionnaires used have not been validated in an African population.

Table 7. Sleep practices among shift nurses

Variable	N (%)
Enough Sleep	
Yes	80(64%)
Problem of Sleep	
Yes	26(20.8%)
Inducing Sleep	
Hot Beverage	28(22.4%)
Alcohol drink	0(0.0%)
Sleeping tab	0(0.0%)
Listening to music	59(47.2%)
Reading	28(22.4%)
Others	10(8%)
Keeping Awake	
Energy Drink	31(24.8%)
Walk Around	75(60%)
Others	19(15.2%)

5. CONCLUSION

This study highlights a high prevalence of stress and anxiety among nurses. The prevalence of

stress and anxiety among the nurses were 83% and 63% respectively while the prevalence of sleep disorder among shift work nurses was 20.8%. Female nurses had a higher prevalence of severe stress 4.72% as compared to the males 0.0%.

Risk factors for severe stress included gender, marital status and shift work. Also, the duration of sleep was higher among nurses on shift work as compared to those on fixed work. Young age and shorter duration of work were associated with higher anxiety symptoms. Alcohol consumption and engaging in exercise were also associated with fewer anxiety symptoms among the nurses.

It is recommended that; Hospital management should develop appropriate intervention programs to reduce workloads like recruiting more nurses and provide positive reinforcements for nurses to reduce anxiety and stress. Nursing staff should also be taught some coping strategies to enable them to manage their stress and anxiety levels.

The healthcare managers should increase the opportunity for social support for the nurses in the workplace. Special emphasis should be placed on identifying those who are at special high vulnerability for work-related stress and anxiety, particularly young and new nurses. Further investigation on the long-term effects of stress, anxiety and sleep disorder on nurses should be conducted.

CONSENT

A consent was sought from each participant before being included in the study. Subjects who did not give their consent were excluded from the study.

ETHICAL APPROVAL

Ethical clearance was sought from the Ethical Review Board of the School of Allied Health Sciences and the Tamale Teaching Hospital, Tamale.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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