

ASSESSMENT AND PREDICTORS OF SHIFT WORK DISORDER AMONG NURSES IN SELECTED NIGERIAN TEACHING HOSPITAL

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ABSTRACT: *Background: Insomnia and sleepiness affect overall work performance. This study assessed Shift Work Disorder (SWD) and socio-demographic predictors of SWD among nurses in selected tertiary hospitals in Southwestern Nigeria. Methods: A cross-sectional design was adopted, 422 nurses were selected using a multi-stage sampling technique. Data were collected using a structured questionnaire and analyzed using SPSS version 20. Results: Findings showed that the prevalence of insomnia was 52.4%, prevalence of significant sleepiness was 46.7%, while the prevalence of symptoms indicative of SWD was 49.6%. The study found associations between marital status and shift work disorder ($P < .05$), tertiary education and shift work disorder ($P < .05$), work experience > 10 years and shift work disorder ($P < .05$), respondents working in Surgical ward and shift work disorder ($P < .05$). Conclusion: Symptoms of SWD is prevalent among nurses and is significantly associated with some socio-demographic characteristics of nurses.*

KEYWORDS: Nurses, Shift Work Disorder, Insomnia, Significant Sleepiness

INTRODUCTION

Background

Globally, nurses as the parenchyma of the health care industry work during the day and night to care for the needs of her patients (Abdalkader & Hayajneh, 2008; Taranjit, Kaur & Shiva, 2012). This requires that the nurse engages in non-standard work schedules which include shift work. Stevens et al. (2011) described Shift work as the organization of working time to cover more than the usual 8-hour workday, up to a 24-hour period. According to the International Agency for Research on Cancer (IARC), (2007) approximately 15-20% of the working population in Europe and North America was employed in either a permanent night or rotating shift schedule. However, In Nigeria, there is dearth of data showing the number of workers on shift work. Nevertheless, nurses' work conditions may lead to physical and emotional exhaustion. Several studies have consistently reported that shift and night work may cause several problems for nurses (Costa, 2010).

In this part of the country, shift work most especially the night shift is known to be stressful for nurses, this is because the night shift has the longest hours and mostly the under-staffed shift. Consequently, Moustaka and Constantinidi (2010) reported that stressed nurses were more susceptible to the occurrence of work-related accidents and diseases. Among the negative consequences that may result are those related to shift work disorder. According to Culpepper (2010) Shift work disorder (SWD) was described as a clinically recognized condition that develops in some individuals who work at night, start work early in the morning (4am-7am), or work according to a rotating shift schedule. Shift work disorder (SWD) is a sleep disorder characterized by sleepiness and insomnia, which could be attributed to the nurses' work

schedule. Sleepiness and insomnia increases the risk for committing medication errors, and may results to personal injuries on shift and while driving home (Fallis et al. 2011). In a study among nurses in Norway, the prevalence of SWD was estimated at nearly 40 percent (Flo et al. 2012). Furthermore, Flo et al (2012) opined that the prevalence rates of symptoms associated with shift work disorder varied from 32.4–37.6% depending on the assessment method and from 4.8–44.3% depending on the work schedule. Few studies have explored shift work disorder among nurses in Southwestern part of Nigeria and, even fewer studies had documented the socio-demographic predictors of shift work disorder among nurses, so there is need to study the socio-demographic characteristics predicting SWD among nurses with a view to providing recommendations to nurses, hence reduce symptoms of SWD and improve overall work performance among nurses.

METHODOLOGY

Research Design

The study adopted a cross-sectional design to assess and determined the predictors of shift work disorder among nurses in selected tertiary hospitals in Nigeria.

Population and Sampling

The study was conducted among nurses working in Lagos University Teaching Hospital (LUTH) Lagos, Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile Ife and Federal Medical Centre (FMC), Owo. A multistage sampling technique was used to select 422 nurses from the tertiary hospitals. The sample for this study was determined using the following formulae as used by Daniel, (1999) :

$$n = \frac{Z^2 \times P(1-P)}{d^2}$$

Where n= sample size

Z= is standard normal deviation set at 95% (1.96) confidence level

P = is the expected prevalence, a prevalence rate of 50 % (0.5) was used for the study.

d= is level of precision (0.05)

$$n = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2} = 384$$

10 % was added for attrition; hence 422 nurses were selected for the study.

Instrument for Data Collection

Data were collected using a questionnaire. The questionnaire assessed shift work characteristics, symptoms of shift work disorder and predictors of SWD. Bergen insomnia scale (BIS) and the Epworth Sleepiness Scale (ESS) were adopted. It had 3 sections. Section A comprised eleven items on socio demographic variables; section B contained the Bergen

insomnia scale (BIS) while section C had the Epworth Sleepiness Scale (ESS). 8-item Epworth Sleepiness Scale (ESS) was used to assess sleepiness. ESS score ≥ 10 indicated significant sleepiness. A 6-item Bergen insomnia scale (BIS) was used to assess insomnia among nurses. Nurses were categorized as insomniacs if they scored 3 or more on at least one of items 1–4, and 3 or more on at least one of items 5 and 6.

Method of Data Analysis

Data collected from the study was analyzed using descriptive and inferential statistics with the aid of Statistical Product & Service Solution (SPSS), version 20. Descriptive statistics like frequency table, bar chart, percentages were used to summarize and provide clear description of the data from the sample, while inferential statistics such as Chi-square test and Logistic regression were used for inferential statistics, value of 0.05 was considered significant.

Ethical Consideration

Ethical approvals for this study were obtained from the ethical committees of the three selected tertiary hospitals with the following reference numbers: OAUTHC/ERC/2016/08/05, LUTH/ADM/DCST/HREC/APP/1275, & FMC/OW/380/VOL.LII/33. Introductory letter was also collected from the Department for the authorities of all the selected institutions. Permission was obtained from the authorities of the selected hospitals with the aim of seeking approval for the conduct of the study. Informed consents were obtained from the respondents, and their participation was strictly voluntary. Their confidentiality was guaranteed. Their rights to participate or not to participate were duly respected.

RESULTS

Table 1 Socio-Demographic Data of Nurses

Variable	Hospital			
	OAUTHC n=205	LUTH n=141	FMCOWO n=76	Total n=422
Age				
Mean$\pm$SD	33.1 $\pm$ 9.1	34.8 $\pm$ 9.1	38.8 $\pm$ 10.0	33.1 $\pm$ 9.4
Sex				
Female	167(81.5)	127(90.1)	64(84.2)	359(85.1)
Male	38(18.5)	14(9.9)	12(15.8)	63(14.9)
Marital status				
Married	126(61.5)	114(80.9)	63(82.9)	302(71.6)
Single	77(37.6)	24(17.0)	12(15.8)	113(26.8)
Widow	2(1.0)	3(2.1)	1(1.3)	7(1.6)
Work experience				
Mean$\pm$SD	9.1 $\pm$ 7.8	10.3 $\pm$ 7.8	14.1 $\pm$ 9.2	10.3 $\pm$ 8.0

Ward

Paediatric	47(22.9)	16(11.3)	31(40.8)	95(22.5)
Medical	48(23.4)	56(39.7)	31(40.8)	134(31.8)
Surgical	57(27.8)	17(12.1)	2(2.6)	76(18.0)
A & Emergency	4(2.0)	18(12.8)	4(5.3)	26(6.2)
Psychiatry	6(2.9)	1(0.7)	2(2.6)	9(2.1)
Obstetric &Gynae	25(12.2)	33(23.4)	4(5.3)	62(14.7)
ICU	18(8.8)	0(0.0)	2(2.6)	20(4.7)

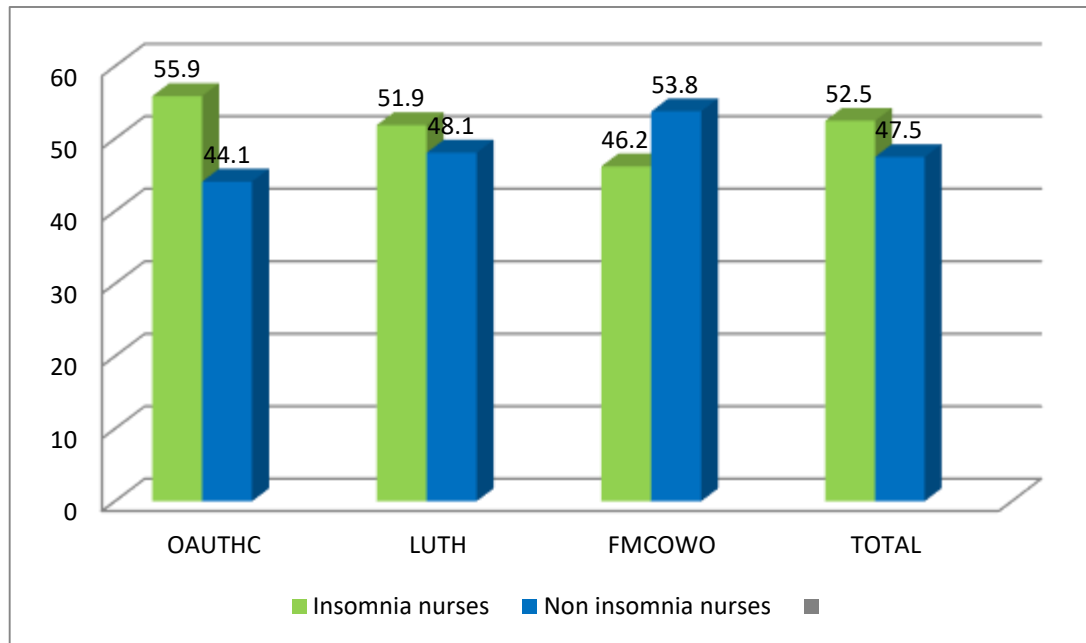


Fig. 1 Percentage of Insomnia among Nurses

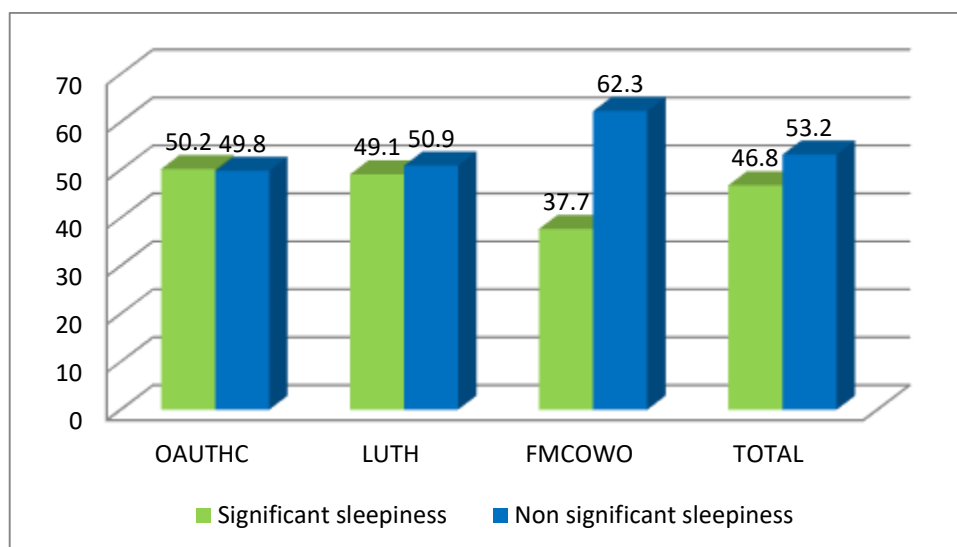


Fig. 2 Percentage of Significant Sleepiness among Nurses

Table 2 Prevalence of SWD among Nurses per hospital type

Hospital	% SWD
OAUTHC	50.3
LUTH	48.9
FMC	38.2
Overall	46.7

Table 2: Showing the association between socio demographic variables and shift work disorder among respondents in selected Nigerian hospitals.

Variables	Respondents with SWD	No SWD	Total	df	χ^2	p-value
Age						
20-30	59(31.6)	128(68.4)	187(100.0)	3	5.31	0.15
31-40	33(27.7)	86(72.3)	119(100.0)			
41-50	16(21.6)	58(78.4)	74(100.0)			
Above 50	7(16.7)	35(83.3)	42(100.0)			
Sex						
Female	94(26.2)	265(73.8)	359(100.0)	1	1.38	0.24
Male	21(33.3)	42(66.7)	63(100.0)			
Marital status						
Married	72(23.8)	230(76.2)	302(100.0)	2	7.97	0.01
Single	42(37.2)	71(62.8)	113(100.0)			
Widow	1(14.3)	6(85.7)	7(100.0)			
Ethnicity						
Yoruba	102(29.4)	245(70.6)	347(100.0)	3	6.32	0.09
Igbo	9(23.1)	30(76.9)	39(100.0)			
Hausa	0(0.0)	6(100.0)	6(100.0)			
Others	4(13.3)	26(86.7)	30(100.0)			
Educational attainment						
RN	40(37.0)	68(63.0)	108(100.0)	2	10.75	0.02
RM	24(20.3)	94(79.7)	118(100.0)			
BNSC	49(26.9)	133(73.1)	182(100.0)			
MSC	1(8.3)	11(91.7)	12(100.0)			
PHD	1(50.0)	1(50.0)	2(100.0)			
Professional cadre						
NO II	62(38.8)	98(61.2)	160(100.0)	5	21.42	0.00
NO I	15(18.8)	65(81.2)	80(100.0)			
SNO	15(19.5)	62(80.5)	77(100.0)			
ACNO	6(26.1)	17(73.9)	23(100.0)			
CNO	4(10.5)	34(89.5)	38(100.0)			
ADNS	13(29.5)	31(70.5)	44(100.0)			

Work experience						
1-5	55(34.6)	104(65.4)	159(100.0)	3	7.65	0.05
6-10	28(24.3)	87(75.7)	115(100.0)			
11-15	8(26.7)	22(73.3)	30(100.0)			
Above 15	24(20.3)	94(79.7)	118(100.0)			
Ward						
Paediatric	25(26.3)	70(73.7)	95(100.0)	6	25.46	0.00
Medical	25(18.7)	109(81.3)	134(100.0)			
Surgical	33(43.4)	43(56.6)	76(100.0)			
A & Emergency	2(7.7)	24(92.3)	26(100.0)			
Psychiatry	3(33.3)	6(66.7)	9(100.0)			
Obstetric &Gynae	17(27.4)	45(72.6)	62(100.0)			
ICU	10(50.0)	10(50.0)	20(100.0)			

Table 3 Logistic Regression analysis predicting likelihood socio-demographic factors that determined shift work disorder.

Variable	Statistical significance	Odds ratio	Confidence interval	
			Upper level	Lower Level
Marital status				
Never married	1(ref)			
Married	0.05	0.60	1.09	0.33
Educational attainment				
Diploma	1(ref)			
Degree	0.04	0.89	1.44	0.55
Professional cadre				
Junior staff	1(ref)			
Senior staff	0.22	1.53	3.04	0.77
Work experience				
<10	1(ref)			
>10	0.95	0.97	1.97	0.48
Ward				
Paediatric	1(ref)			
Medical	0.17	1.57	3.04	0.81
Surgical	0.02	0.46	0.91	0.23
A & Emergency	0.69	4.13	19.00	0.89
Psychiatry	0.60	0.67	3.00	0.15
Obstetric &Gynae	0.83	0.92	1.93	0.44
ICU	0.02	0.31	0.89	0.11

DISCUSSION

Two-third of the nurses were female, this finding agreed with Ogunlade and Ogunfowokan (2014) who reported that up to two-third of the nurses in their study were females. This corresponded to the fact that female nurses were more than male nurses. The study also showed

that up to three-quarter of the nurses were Yoruba, this was probably because the study was conducted in Southwestern Nigeria, being a Yoruba dominated area. The study further showed that the mean age of nurses was 34.9 (± 9.3) years. This finding was in contrast to Johnson and Okeke (2016) who reported the mean age of respondents to be 32.86 $\pm$ 12.06 years. Also, this finding disagreed with Ogunlade and Ogunfowokan (2014) who reported the mean age of 37.7 (± 9.3) years. Also, the study showed that almost half of the nurses had BNSC, this depicts improvements in the quest for acquiring University degrees as this findings ran contrary to Ogunlade and Ogunfowokan (2014), who reported one-quarter had BNSC. The study also showed that almost half of the nurses were nursing officer II, this further showed that majority of the nurses in this study were junior nurses. This finding was supported by Anbazhagan, Ramesh, Nisha and Joseph (2016) who reported that about half of the nurses in their study had 1-2 years of experience in shift duties. However, this finding ran contrary to Ofonime et al. (2016), who submitted that more than half of their respondents were nursing officers with less than 5years experience. The study further showed that the mean working experience was 10.7 $\pm$ 8.4. This revealed that the average nurse who participated in the study had worked for 10years. This agreed with finding from Ogunlade and Ogunfowokan (2014), who reported a mean work experience of 12.6 (± 9.6) years. Furthermore, the study showed that below half of the nurses worked in Medical ward. The study showed that more than half of the nurses had insomnia, a symptom of shift work disorder; also, the study showed that less than half of the nurses had significant sleepiness, which was also a symptom of shift work disorder. Hence, up to half of the nurses had symptoms predictive for shift work disorder. This finding was in contrast to the study conducted by Anbazhagan et al. (2016) who reported that less than half of nurses in their study had shift work disorder. Also, the finding disagreed with the study conducted by Flo et al. (2012) among Norwegian nurses who reported that below half of the nurses had symptoms predictive of shift work disorder. Also, this finding disagreed with the study conducted by Waage et al. (2014) who reported that up to a quarter of nurses had symptoms predictive of SWD. It also disagreed with the study conducted among Japanese nurses by Asaoka et al. (2013) where it was reported that a quarter of the nurses had symptoms predictive of shift work disorder. This showed that the symptoms predictive of SWD were more prevalent among nurses in this study than among those reviewed. This is a call to the hospital administrators to review the working conditions in which nurses in tertiary hospitals work in, so as to reduce the risk associated with working concurrently with symptoms predictive of Shift work disorder. The study also found associations between marital status and shift work disorder ($P = 0.05$, Odd ratio-0.60, CI: 0.33 -1.09). It could be that married nurses are more faced with higher level of stress compared to those who are single. A common source of their stress could be house chores and caring for their family. This agrees with Flo et al. (2012) who reported associations between shift work disorder and night work and the number of shifts worked. Also, tertiary education was associated with shift work disorder ($P < 0.05$, Odd ratio- 0.89, CI: 1.44 -0.55). This could be that nurses who had more academic qualification had been exposed to higher levels of stress or were being exposed to some academic stress as at the time of the study. The result also revealed that senior staffs were 2 times likely to have shift work disorder than the junior staffs. Furthermore, nurses who had work experience greater than 10years were 1 time more likely to have shift work disorder ($P > 0.05$, Odd ratio- 0.97, CI: 0.48 – 1.97) compared to those with less than ten years working experience. This agrees with Flo et al. (2012) who found associations between age and shift work disorder among nurses. Finally, high association was observed between nurses working in Surgical wards and shift work disorder compared to other wards. ($P < 0.05$, Odd ratio 0.46, CI: 0.91 – 0.23). This could be related to the high quantum of work faced by nurses working in the Emergency departments.

This study presented the socio-demographic variables of nurses that could predispose them to having symptoms of SWD such as insomnia and sleepiness

CONCLUSION

Symptoms of shift work disorder among nurses are a striking issue. High level of sleepiness on the shift is dangerous and inimical to practice. This study showed that socio-demographic characteristics such as marital status, academic attainment and the ward where nurses work could predispose them to shift work disorder.

IMPLICATIONS

- Nurses who have spent more than 10years rotating shifts should progressively reduce the length of their shift, most especially night shifts. This will go a long way to reduce the work related stress.
- Married nurses should adopt appropriate stress management strategies to help cope with burdens of child care if they currently have, and house chores including shift work stress.
- Nurses should observe breaks during their shifts.
- Nurses working mostly in surgical wards and on night duties are encouraged to observe pre-shift napping, as this will improve the defenses against shift work disorder among nurses.
- It is also important that each nurse, most especially those with higher degrees understand the need to get sufficient sleep.

RECOMMENDATIONS

- I. Future research should be done on the effects of shift work on nurses' health in this part of the continent.
- II. Also, future studies on shift work disorder should be conducted among other health practitioners who also work on rotating basis, whether doing shifts or running call duty.

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