Effects of Long Hour Shift Among Female Nurses and Increase Risk of Committing Errors and Patients' Satisfaction: A Case Study of University of Maiduguri Teaching Hospital, Maiduguri, Nigeria

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Abstract: This study investigated the effect of long hour shift on hospital nurses', increase risk of committing errors, patients' outcomes and satisfaction. A descriptive research design was utilized in this study to investigate the effect of long hour shift on female hospital nurses' and patients' care outcome and satisfaction Questionnaire was systematically distributed to nurses in each of the twenty eight wards and units of the University of Maiduguri Teaching Hospital. One hundred and ninety four respondents returned the questionnaire. The study revealed that long hour shift affects the nurses' wellbeing and the care they provide to their patients. The study also revealed that it affects their social life. This study therefore recommends eight to ten hour shift to reduce the burden on the nurses so as to provide positive patient care outcomes.

Keywords: Long Hour, Shift, Nurses, and Errors.

INTRODUCTION

Errors and near misses are inevitable in hospital settings, it is therefore important to have healthcare providers particularly nurse that are healthy with less stress to perform patient care. Many studies suggest that when nurses work twelve or more hours at a stretch it leads to errors and patients dissatisfaction. In many hospitals the use of extended work shifts and overtime has escalated as hospitals try to copewith a shortage of registered nurses (RNs) [1]. They further stated that nurses working on specialized units such as surgery, dialysis, and intensive care are often required to be available towork extra hours (on call), in addition to working their regularly scheduled shifts.

In Nigeria, nurses covered three 8-hour shifts (morning, afternoon, and night, but recently some hospitals introduced long hour shifts particularly night shift). Scheduled shifts may be eight, twelve, or even sixteen hours long and may not follow the traditional pattern of day, evening, and night shifts. Although twelve-hour shifts usually start at 7 p.m. and end at 7 a.m., some start at 7 a.m. and end at 7 p.m. Nurses working on specialized units such as surgery, dialysis, and intensive care are often required to be available to work extra hours (on call), in addition to working their regularly scheduled shifts. Twenty four-hour shifts are becoming more common, particularly in emergency rooms and on units where nurses self-schedule [2]. Here in Nigeria (Maiduguri) long hour shift is found during the night shift. However, in UK, US, and other western countries number of working days spent per week is reduced to three or four instead of the traditional five days, and shifts are divided into two instead of three. Traditional eight-hour shifts for hospital nurses are becoming a thing of the past [3]. Nurses increasingly work twelve-hour shifts; this schedule gives nurses a three-day work week, potentially providing better work-life balance and flexibility [4, 5]. Sleep is a vital necessity in which the body renews itself and represents foundation of a healthy physical and mental life which directly impacts the person's quality of life [6]. Recent evidence suggests that shift workers generally suffer acutely and chronically impaired health [7]. There is also growing evidence that nurses have an increased risk of divorce and having children with anxiety and behavior problems [8]. Studies suggest that in Britain, average sleep duration have decreased from nine hours in 1910 to 6.9 hours on work days in 2002 [9].

Several studies have recognized impaired sleep as a common problem among nurses [10, 2]. Over worked, fatigued and stressed nurses are at a higher risk of making mistakes that threaten their own health as well as patient safety [11]. For nurses working either 8 or 12-hour shifts, sleep deprivation amplifies the risk for patient errors, and personal injuries on shift [10, 2]. Other concerns related to impaired sleep involve effects on the immune and cardiovascular systems. A decrease in the immune system is often associated with lack of quality sleep and cardiovascular regulation is essential; constant changes due to sleep loss could increase the risk of many cardiovascular diseases [12].

In countries such as England, Ireland and Poland, 12-hour shifts are far more common; in England, 32% of day shifts and 37% of night shifts is reported to be12 hours or longer [13].

Despite the negative effects of long hour shifts on both patients and nurses many health care organizations are introducing it. There is limited research on the impact of long shifts on nurses [15], or on the quality of the care they provide to patients [14]. In addition, there is inadequate understanding of whether patients' satisfaction with care is affected by the extended hours worked by nurses. Research carried out by Witkoski [16] shows that patients were more likely to report dissatisfaction with care at hospitals with higher percentages of nurses working 12-hour shifts or longer, and patients reported the highest levels of dissatisfaction at hospitals with the highest percentage of nurses working shifts longer than 13 hours. Longer hours shifts are associated with more errors in patient care, higher rates of injuries, and increased riskof motor vehicle collision due to drowsy driving, according to Geiger-Brown [3].

Definition of terms

Errors: Error is an inevitable aspect of all the professions particularly health and treatment-related jobs and it should be acknowledged that committing it cannot absolutely be preventable. Among the causes that necessitate the evaluation of nursing errors, it should be noted that errors not only lead to damage and mortality for the patients, but also they are one of the obvious and costly problems in the hospitals.

Near miss: dangerous situation which could have harmed a patient but was avoided by chance or early detection.

Burnout: consequences of severe stress and high ideals experienced by people working in "helping" professions. Doctors and nurses, for example, who sacrifice themselves for others, would often end up being "burned out" – exhausted, listless, and unable to cope.

Needle sticks injury: wounds caused by needles that accidentally puncture the skin of usually healthcare workers.

Shift: Shift work occurs in a work schedule that utilizes 24 hours a day and occasionally, 7 days a week, to keep an organization operating. Shift work, generally described as working outside day light hours, is difficult physically and mentally but is inherent to many healthcare positions.

Objectives

This study investigated the effect of long hour shift on female hospital nurses' and patients' outcome and satisfaction which could negatively affect both the nurses and the patients.' The study also examined the relationship between nurses' shift length and its impact on their health and performance on their job. The study also examined the relationship between nurses shift length and patient outcomes and satisfaction, using data from the patients. The data includes information about patients' assessment of overall care and nursing care in the hospital. The study explained whether nurses' shift specifically is associated with patient satisfaction.

MATERIALS AND METHODS

The study was conducted at the University of Maiduguri Teaching Hospital that has over 600 bed capacities. It is a tertiary health institution located in Maiduguri the capital of Borno state. It serves the Northeast zone of Nigeria and the neighbouring countries of Chad, Niger and Cameroun Republics. A descriptive research design was utilized in this study to investigate the effect of long hour shift on female hospital nurses' and patients' care outcome and satisfaction.

Subjects

The subjects of this study were the female nurses of the University of Maiduguri teaching hospital who run the three shifts and patients on admission in the hospital. Data was collected using systematic sample procedure that best suits this study. Systematic sample of 210 female nurses were selected from all the 28 wards and units of the hospital. While 20 patients were interviewed and 5 charge nurses were randomly selected for the key informant interview (KII).

Tools

A questionnaire with cover letter explaining the study was systematically distributed to female nurses at the University of Maiduguri Teaching Hospital. There are 28 wards including special care baby unit, intensive care unit, kidney centre, accident and emergency unit, and operation theatre complex as well as amenity wards. There are about 10 to 15 nurses in each of these wards or units, these nurses run three shifts and few others run call duty as well. There are about 460 nurses working in the hospital. Therefore a sample size of 210 nurses was selected using an updated version of Krejcie and Morgan Table of Sample Size Determination [17]. A convenient sampling technique was employed in selecting the 20 patients for the interview. Therefore, 8 female nurses were systematically selected from each ward or unit. Out of the 210 questionnaires distributed to the female nurses who run the three shifts 194 were returned. The questionnaire was divided into three sections; the socio-demographic characteristics of the respondents, description of shift pattern of respondents, and effects of long hour shift on both nurses and patients.

Data of patients' assessment of their care experience during hospitalization was used. A four item Likert scale was used. It included question on assessment of care; communication, medication, and nurse behaviour (friendliness).

A key informant interview was conducted with the Nurse In-charges of the wards. Five (5) matrons were interviewed from five randomly selected wards/units. These include;-Accident and Emergency Unit, Emergency Paediatric Unit, Female Surgical Ward, Labour Ward and Male Medical Ward. Data was collected on effects of long hour shift; preferences of the type of shift and possible solutions to reduce the effect of long hour shift.

DATA ANALYSIS

Data for this study was analyzed by frequency tables and percentage distribution that examined shift length, effects of long hour shift on both the nurses and the patients, and the challenges they experienced.

Table-1: Demographic characteristics of respondents

Demographic characteristics of respondents	Frequency	Percent (%)
Age		
23-35	93	47.94
36-45	62	31.96
45 and above	39	20.10
Total	194	100
Qualification		
Registered nurse	86	44.33
Graduate nurse	58	29.90
Other speciality	50	25.77
Total	194	100
Experience		
1-5 years	61	31.44
6-10 years	64	32.99
11-15 year	52	26.80
Over 20 years	17	8.77
Total	194	100

Source: fieldwork 2016

Data from table 1 revealed that 47.94% of the nurses were within the age bracket of 23-35 years representing the highest percent of the nurses. While 31.96% were within the age bracket of 36-45 years, and 20.10% were above 45 years. The table also revealed that 44.33% of the nurses were registered nurses (diploma holders), while 29.90% were graduate nurses, and 25.77% hold additional speciality. The highest number of 32.99% has at least 6-10 years of working experience and lowest 8.77% have over 20 years of experience. This finding shows that nurses that have over 20 years of experience were less likely to work for long hour shift.

Table-2: Description of shift pattern of nurses

Description of shift pattern of respondents	Frequency	Percent (%)
Shift pattern		
Morning shift only	34	17.53
Morning, afternoon, and night shifts	160	82.47
Total	194	100
Number of hours per shift		
Morning 8 hrs, afternoon 8 hrs, and night 12 hrs	58	29.90
Morning 8 hrs, afternoon 8 hrs, and night 14 hrs	136	70.10
Total	109	100
Total number of shift hours per week		
Morning and Afternoon shifts 40 hours each & Night shift 84 hours	29	14.94
Morning and Afternoon shifts 40 hours each & Night shift 98 hours	165	85.0
Total	194	100
Are you comfortable with the long hour shift?		
Yes	73	37.63
No	121	62.37
Total	194	100

SOURCE: Authors' analysis of data results.

Data from table 2 revealed that 82.47% of the nurses rotate the three shifts available in the hospital (morning, afternoon, and night), while 17.53% of the nurses do not rotate on shift duty. The highest number of 85.05% of the nurses spent 40 hours per week on morning and afternoon shifts and 98 hours on night shift. While 14.94% of the nurses spent 40 hours on morning and afternoon shifts and 84 hours on night shift. It also revealed that 62.37% of the nurses were not comfortable with the long hour shift.

Table-3: Effects of long hour shift on nurses

Effects of long hour shift on nurses	Frequency	Percent (%)
Effects of long hour shift on nurses		
Fatigue	48	24.74
Sickness	48	24.74
Wanting to leave the job	43	22.17
Burnout and job dissatisfaction	55	28.35
Total	194	100
Family challenges experienced during long hour shift		
Yes	139	71.
No	55	28.35
Total	194	100
Effects of long hour shift on patients perceived by nurses		
Risk of committing error	82	42.27
Work left unattended to	74	38.14
Patient dissatisfaction	38	19.59
Total	194	100
Effect of long hour shift on nurses' social life		
No time for social activities	88	45.36
No time to relax at home	60	30.93
Others please specify	46	23.71
Total	194	100

Source: fieldwork 2016

Data on table 3 revealed that the highest number of 28.35% of the nurses experience burnout and job dissatisfaction, 24.74% experience fatigue and sickness, while 22.17% wanting to leave the job. About 71.65% of the respondents complain of challenges at home due to the long hour shift. While 38.14% of the nurses agreed that work are sometime left unattended to, 42.27% agreed that chances of committing error is high, and 19.59% agreed that patients' dissatisfaction is high due limited attention they receive from the nurses. Also 45.36% of the nurses complain of no time for their social activities, while 30.93% complain of limited time for relaxation at home, and 23.71% complained of frustration and wanting to leave the job.

Table-4: Effects of long hour shift on patients (patients' views/experiences)

Patients' views on long hour shift	Frequency	Percent (%)
Patient views		Yes/No
Nurses communicated well	39/09	20.10/4.63
Nurses serve medication on time	42/ 06	21.64/3.09
Nurses are friendly	38/11	19.58/5.70
Patients received care promptly	32/17	16.49/8.77
Total	194	100

Source: fieldwork 2016

Data on table 3 revealed that the 4.63% of the respondents (patients) agreed that there is poor communication between them and the nurses. Another 3.09% agreed that medications were not served on time, while 5.70% claimed that nurses are not friendly, and 8.77% claimed that there is delay in responding to their needs.

Analysis from Key Informant Interview

Data collected from the key informant interview revealed that there are various effects of long-hour shifts, which have impact on nurses, nursing care outcomes and the patient. A respondent listed the following as effects of long-hour shift; "burn out, job dissatisfaction and wanting to leave the job". One of the matrons said, "Medication errors/mistakes, lateness to duty and social alienation, as effects of long hour shift." Poor nursing care outcomes such as lack of

documentation, non-adherence to schedules/regimen and prolonged hospitalization were listed as effects of long hour shift.

On preference to length of shift, a matron, said, "I prefer the 8 hour shift." Another respondent even wished for a shorter length of shift. Nurses in University Maiduguri Teaching Hospital have run longer hour shift during the peak of Boko Haram Insurgency. A respondent has this to say, "I run 11-14 hour shift during the peak of the insurgency."

Various suggestions have been proffered to reduce the effect of long-hour shift. One matron said, "Recruiting more staff would reduce nursing going on long hour shift." Preparing the duty roaster well ahead of time would make nurses prepare for long hour shift. Another subject advocated for extension of maternity leave to six months.

DISCUSSIONS

Data collected on 194 nurses on work shifts revealed that nurses at the University of Maiduguri teaching hospital worked longer hours, and generally worked more than eighty hours per week. More than half of the shifts worked exceeded ten and a half hours. Although 37.67 percentof the respondents were comfortable with the work schedule of long hour about 62.37% were not. Based on the findings of this study it is obvious that long hour shift affects the wellbeing of both the nurses and their patients as expressed by the nurses. Even though nurses were satisfied with working longer shift schedule as reported in recent research (and in the findings of this study), the data also showed that nurses working the longest shifts were among those most likely to experience burnout and job dissatisfaction [18]. And, patients treated at the hospitals where nurses worked the longest shifts were the most likely to be dissatisfied with their care, this result conform to the findings of this study.

The study also revealed that 24.74% of the respondents complained of experiencing sickness and fatigue respectively. Another 42.27% agreed that risk of committing error is high and 19.59% agreed that patient dissatisfaction is common due to limited time allocated to them. This findings is in line with that of [19, 20, 21], which stated that mounting evidence points to long hours as a contributor to poor patient care outcomes such as errors and infections as well as poor nurse outcomes such as musculoskeletal and needlestick injuries. Working overtime, whether at the end of a regularly scheduled shift (even an 8-hourshift) or working more than 40 hours in a week was associated with a statistically significant increase in the risk of making an error [22]. According to [2], nurses who work longer than 12 consecutive hours or work when they have not obtained sufficient sleep are putting their patients' health at risk; risk damaging their own health;

and if they drive home when they are drowsy, also put the health of the general public at risk.

Findings of a research study conducted by Stimpfel [23] revealed that nurses who reported working for 12 hours or more or overtime on their last shift were associated with increased odds of burnout, job dissatisfaction and intent to leave their employers, which this study also found that 28.53% of the respondents complained of burnout and job dissatisfaction. Nurses' shifts of more than thirteen hours were also associated with greater likelihood of nurse burnout, job dissatisfaction, and intention to leave the job [24].

This study revealed that 45.36% of the nurses complained that their social lives were affected by the long hour shift thereby depriving them from attending to social events. Also, 71.65% complained of experiencing challenges at home which was also found elsewhere in a study carried out in India by Rathore, Shukla, Singh, and Tiwari [16], on problems faced by female nurses in shift work. The study found that female nurses in different age groups faced many problems that affect their health and wellbeing; fatigue, family and social problems. They could not give much time to their children. Common problem was the insufficient sleep during night shifts. The nurses had to accommodate to the needs of the family, children in particular along with the adjustments to be made due to shift work. Children and husband in some cases do not cooperate which lead to more frustration [16]. Nurses from this study admitted that inability to attend to social gatherings regularly is affecting their relationship with family members and friends, and in some cases leading to frustration.

RECOMMENDATION

Based on the findings of this study, it is advised that nurses are given shorter shift hours to enable them attending to their patients' and have enough time for their personal activities. It is beneficial to both the nurses' and the patients to have enough nurses because shortage of nurses also leads to overtime or long hour shift. It is also advisable to monitor the work schedule in an attempt to find out any negative effects on both the nurses and the patients. Finally, the nursing workforce needs to be expanded to address the issue of shortage of nurses.

CONCLUSION

Long hour shifts have their consequence on patient care outcome and has health and social effects on the female nurses. The International Labour Organization (ILO) and International Council for Nurses (ICN) both recommend shorter period of work shift for effective patient care outcome with minimal work hazard to the nurse. Longer shift hours will therefore be counterproductive, where possible nursing

workforce should be increased. A nurse-patient ratio of 1:3 is recommended to reduce burnout and fatigue. Also risk of making errors is reduced.

Limitations

More research is needed to understand the effects of long hour shift on both the wellbeing of the nurses and the patients. It is also necessary to conduct a research on larger sample size involving many hospitals. Negative effects such as stress, burnout, errors, job dissatisfaction, fatigue, and many other adverse effects need to be investigated further. Comparison study to investigate satisfaction between 8 hour shift and 12 hour shift is also needed.

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