Multi-Knowledge Electronic Comprehensive Journal For Education And Science Publications (MECSJ)

ISSUE (23), August (2019)

ISSN: **2616-9185**

www.mecsj.com

The Influence of Working Longer Shift on Nurses` Quality of Care

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Abstract

Background: Long work shifts extending beyond twelve hours are nearly inevitable in most health care organizations. The acute shortage of nurses is one reason why long duration of work shifts are common. The global shortage has been estimated by the World Health Organization to hit 12.9 million by 2035. However, not much is known concerning the effect of the duration of shift on the nurse well-being and quality of patient care especially in Saudi Arabia.

Aim: The aim of this study is to explore the significant relationship between the work shift and duration of shift with the quality of patient care, perceived job satisfaction, intent to leave, and impact on their health state.

Methods: This present study utilized cross-sectional correlation descriptive design. A convenience sampling technique was used to recruit 491 staff nurses from a selected medical city in Riyadh in Saudi Arabia. The nurses filled the Nurse Satisfaction with The Job and Intention to Leave Survey. The data were collected between June to August 2017 and were analyzed using the Statistical Package for Social Sciences Version 22.

Results: In this study, (36.3%) were moderately satisfied with their job, (57.3%) followed the morning shift, and (55.4%) of them have the intention to leave the organization the following year. Nurses mostly complained of being tired (84.2%), with low back pain (62.1 %) and gets fatigued (60.6%). Most of the nurses did not agree that the duration of shift should be reduced (54.9%), favors overtime (52.7%), and gave opportunities to socialize (50.2%). The study found that the duration of shift is significant associated with the nurses' job satisfaction ($p = 0.015$) and their intent to leave ($p = 0.0006$). The working shift was found to significantly influence nurses' health discomforts after duties ($p < 0.001$).

Conclusion: Staff nurses working for over 12 hours are less satisfied and more likely to leave the organization. The health discomforts experienced by the staff nurses at the end of the shift varies more likely according to their work shift than duration.

Keywords: Work shift, length of work shift, nurses, quality of nursing care, Saudi Arabia

1. INTRODUCTION

Registered nurses are a professional group that has been recognized as experiencing high levels of stress-related ill health (i.e., burnout). Nurses, typically viewed as physicians' aspirants, shift hours could fall at night or day depending on workload and scheduling policy where one works. Odd working hours could affect nurses' health and well-being in many ways. Disruption of sleep patterns, overall fatigue, declined vigilance and attention, and increased stress levels are some of the common negative effects of abnormal shiftwork scheduling (Hamid, Malik, Kamran, & Ramzan, 2014).

The work patterns of registered nurses (RN) remains a central point of focus for most clinical researches due to various factors inherent to the global health care sector. Over the past two decades, RN's patterns of work attracted significant interest from scholars as series of evidence show avail evident that long work hours among nurses is associated with poor quality of patient care (Stimpfel & Aiken, 2013); (Stimpfel, Sloane, & Aiken, 2012). Among the known issues associated with long working hours are: errors, needle injuries, hospital generated infections, and poor attention to details (Olds & Clarke, 2010). Hospitals incorporate recovery intervals between shifts, sleep options for recovery during the intervals, fatigue reduction, personal, and family engagement during the intervals as mechanisms of coping with stress resulting from long shifts.

As the dynamics of human resource in global healthcare sector necessitates shift work, hospitals need round the clock attendance thus making work at odd hours a norm for the nurses and other healthcare professionals. Global shortage of nurses and other healthcare workforce is overwhelming – the World Health Organization (WHO) estimates the figure to hit 12.9 million by 2035 (Aluttis, Bishaw, & Frank, 2014). Concerns of nurses' working duration cover length of shifts and the nature of rotation in the job. Ideally, nurses interact with patients, right from admission to discharge, thus making them best suited to observe and report on quality.

Organization administrators could reduce nurse shifts in a day based on a misconception that reducing handovers enhance effectiveness of evidence-based practice and reduce possible medical errors resulting from miscommunication during shift handovers (Barton, 2009). According to Dall'Ora, Griffiths, Ball, Simon, and Aiken(2015) nurses prefer 12-hour shift due to its inherent benefits such as work-family balance and nurses working 12 hours in a single shift experience higher degree of burnout than nurses working less shift hours do.

Furthermore, the authors indicated that employers believe that changing number of shifts per day from 3 to 2 minimizes period of shift overlap as well as frequency of handovers, which reduces overall workforce requirement for cost saving measures. Handoffs overlaps between shifts reduce efficiency, increase discontinuity, and errors.

Shift duration influence on patient care and safety is a silent topic for healthcare organizations administrators. Understanding the components of nurses' shifts and conditions of work during the long hours allows healthcare organization managers to make informed decisions on the suitable systematic changes related to nurses' work and optimization of patient care.

Evidence from a series of research on the relationship between long working hours and poor quality of care has motivated recognized organization such as the Institute of Medicine (IOM) and American Nursing Association (ANA) to call for an end to mandatory overtime in healthcare organizations. Kieft, De Brouwer, Francke, and Delnoij (2014) concluded that nurses' degree of satisfaction with work environment influences service delivery to patients. Griffiths et al. (2014) conducted a cross-sectional study in 488 hospitals across twelve European countries. The authors found that 15% of the respondents worked more than 12 hours and normal shift duration varied between countries as well within countries with various states. Nurses working more than 12 hours have high chances of poor patient safety. In spite of all studies, little research exists to explore the effect of long shift hours on well-being of nurses and patient care quality. Nevertheless, extensive studies evaluating connection between nurse shift duration and quality of care are limited. This research project seeks to collect fresh and unique data from large nurse survey to supplement the existing gaps in literature.

Apart from shiftwork planning and hours worked, the article will spot more light into the influence of organizational culture on the willingness of nurses to engage in overtime with feeling the effect of stressors such as burnout, fatigue, and limited social life.

The two primary aims of this research are:

- To provide current information about nurses' shift duration and work scheduling; while estimate the impact of shift duration on nurse observations or activities involving patient care and safety.

- To study the significant relationship between the work shift and duration of shift with the perceived job satisfaction, intent to leave, interest to have overtime, and the lack of opportunity to socialize.

The study hypothesis states that the long duration of shift significantly impacts the nurses' perception on job dissatisfaction, intent to have overtime, intent to leave, opportunity to socialize, and discomforts after work shift.

2. Literature Research

2.1 Long Shift Hours Linkage to Productivity, Performance, and Safety

Caruso (2013) investigated the impact of shiftwork and long working hours on nurses. The author acknowledged that healthcare organizations have the obligations of providing round the clock care for patients thus making shiftwork and long working hours inevitable in most companies facing human resource shortage. Findings from the study indicated that shiftwork and long working hours increase the risk of decline in performance, obesity, injuries, and various chronic diseases. The authors concluded that employers could minimize the risks associated with shiftwork and long working hours by making sleep a priority in their work scheduling system and integration with nurses' personal lives.

In a similar vein, Bae & Yoon (2014) examined the extent to which state laws concerning overtime regulations affect mandatory overtime practice among registered nurses. Through estimation of difference-in-differences, the authors used national survey of RNs for years 2004 and 2008. Findings indicated that mandatory overtime and normal working hour's regulations reduce probability of nurses working overtime by 3.9% as well as reduce the likelihood of working more than forty hours by 11.5%. The authors concluded that states' regulations on mandatory overtime and adherence to consecutive working hours reduce nurse work hours during overtime shiftwork. However, Estabrooks et al. (2009) thought that researches linking long hours and the quality of nurses' performance are still lacking or limited. Systematic review of eight online databases, academic journals, and governmental websites found that working longer shifts contributed to clinical generated errors and decreased patient attention to clinical details among nurses. Longer hours were associated with increased complains such as health complications, well-being, stress, job dissatisfaction, and alcohol abuse among nurses.

2.2 Impact on Health

Nurses face exposure to various health complications when they work for long shiftwork hours. Harrington (2001) concluded that shiftwork causes sleep debt, especially the night shift. The author affirmed that quantity of sleep can decline by two hours per day, but the poor quality of sleep has deleterious effects on nurses. Such sleep deficiency can make nurses doze off at work thus eating into valuable time of the health institution as well as increase the probability of medical errors. In addition, shiftwork can potentially affect the psychosocial behavior of nurses. According to Dembe (2005) anxiety and depression among nurses in shiftwork can adversely affect their mental health.

Yoo, Kang, Paek, Min, & Cho (2014) found that 85 workers out of the 1,079 subjects had hypertension diagnosis after a study on the worker who clocked 47 hours per week. The authors concluded that working long hours could increase the rate of hypertension cases. Employees working long hours – more than 40 hours per week – are 40% more likely to expose themselves to cardiovascular heart diseases (Virtanen et al., 2012).

With shiftwork, it is possible that employees get poor catering services thus increasing their likelihood of experiencing digestive disorders. The common gastrointestinal disorder among shift workers includes dyspepsia, heartburn, flatulence, and abdominal pains (Costa, 2010). The prevalence of gastrointestinal disorder conditions is higher among nurses scheduled in shift rotation than those working during the day with 81.9% (Saberi & Moravveji, 2010).

Apart from gastrointestinal disorders, various studies suggest that night shiftwork can potentially expose women to special reproductive risks – if they fall within the childbearing age bracket. Gamble, Resuehr, & Johnson (2013) indicated that working nights or shift rotation have strong correlation with reproductive issues such as irregular menstrual cycles, infertility, low-birth weight, and pre-mature delivery among others.

Studies linking reproductive disruption and shiftwork could shed more light on whether long hours and irregular shift rotation causes misalignment of circadian and/or cause reproductive system impairment.

Mahoney (2014) also supported that circadian rhythm – which facilitate successful reproductive cycles, pregnancy, and mating – face the risk of alteration when one participates in shiftwork.

Sleep debt and clock gene disruption strongly associate with infective reproductive system. The author adds risks of breast cancer, miscarriage, and altered hormonal secretion patterns to the list of reproductive issues due to long shiftwork hours previously cited above.

2.3. Impact on Nurses' Risk Exposure

Nurses experiencing fatigue are more likely to perform poorly and experience high frequency of accidents. Wagstaff & Sigstad Lie (2011) found that shiftwork as well as long working hours pose significant safety risks to employees. Increase in shiftwork and number of hours worked beyond the recommended figures increase the accident rates by 50%. Salminen (2016) also supported sentiments by Wagstaff & Sigstad Lie (2011) by concluding that working beyond 12 hours a day increase probability of occupation injury by 147% in the US.

Extended stay in such work setting could potentially increase the levels of exposure to toxic chemicals (Holland, 1995). Nurses can face hazardous exposer to chemicals such as aerosols, gases, and skin contaminants depending on their line of medical practice in a given day (Allday, 2007). Long working hours can cause acute and long-term exposure thus nurses can suffer asthma attacks due to such exposures. Again, disinfectants, latex, and volatile chemicals are associated with various health complications.

2.4. Impact Personal Life Issues and Burnout

Tai et al. (2014) found that married nurses had higher chance of having poor family function in comparison to single nurses. However, married nurses who work during day shift had significant ability to have well function families. Evidently, shiftwork could affect family function for married nurses because of the missing in-action for most family obligations. Women nurses feel the burden of long working hours because of their traditionally domestic role of managing families. For nurses with children, long-hours deprive them the opportunity to interact with their kids, check their schoolwork, and life progression. Korompeli et al. (2014) indicated that female nurse and those with chronic diseases experienced difficulty when allocated to work in rotating shifts.

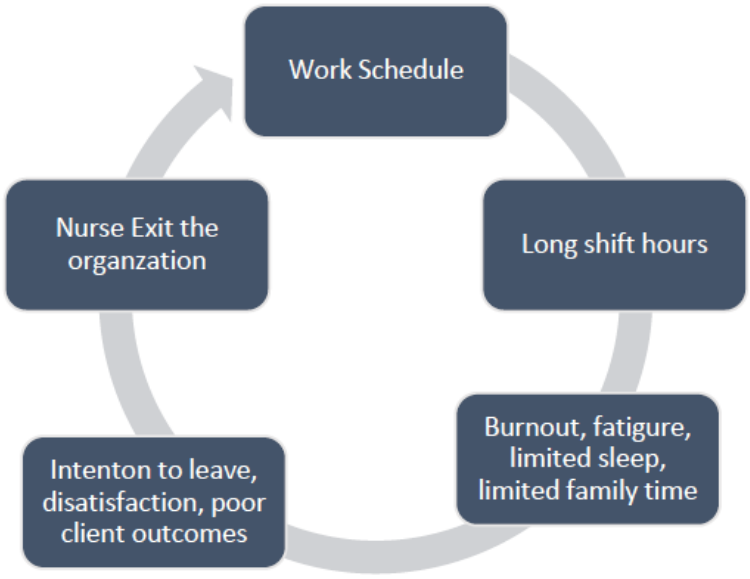
Demir, Ulusoy, & Ulusoy (2003) conducted a cross-sectional study to determine the cause of burnout among professional nurses. Findings showed that nurses with higher education levels and higher work experience reduce burnout levels among nurses working night shifts.

Kalliath & Morris (2002) found that job satisfaction directly influences emotional exhaustion – burnout. Long work hours can cause job dissatisfaction when nurses experience fatigue and strain in social life. Since shift work and long hours affect job satisfaction levels, it also influences the level of burnout among nurses.

2.5. Theoretical Framework and Conceptual Framework

The Neuman Systems Model (NSM) provides a practical approach applied in healthcare organizations to integrate activities of caregivers and administrative staff members to facilitate provision of positive patient outcomes. According to Turner & Kaylor (2015), NSM model illustrates a dynamic guideline used by practitioners in their line of work and emphasizes client individuality by considering the uniqueness of each patient, situation at hand, and background. NSM can assist in understanding the dynamic relationship between nurses, stressors, and environment. Fig. 1 shows application of NSM in examining and exploring the relationships among shiftwork, recovery, and nurses' desire to leave.

Fig. 1. Neuman Systems Model application in effect of long shift hours

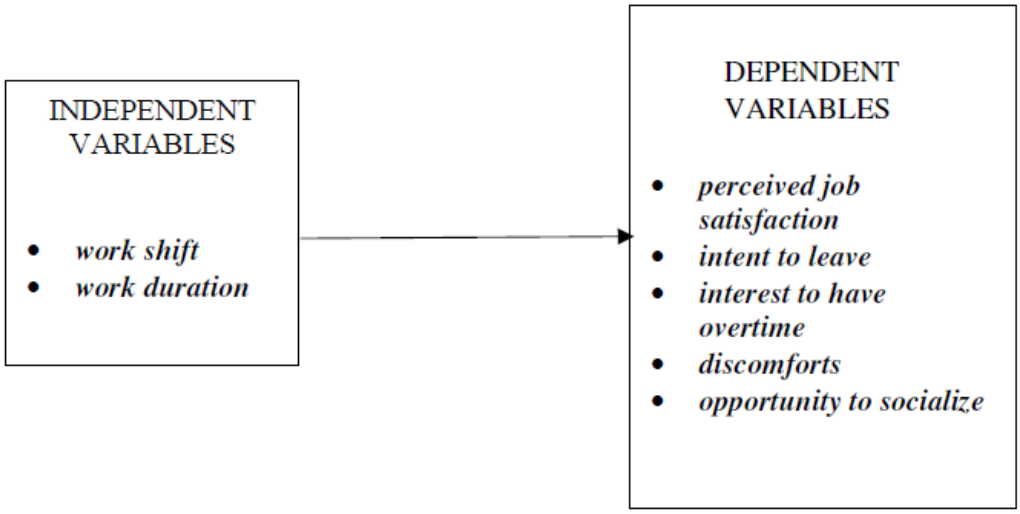


NSM suggest that every client (patient in this case) is unique, responds to different circumstances in different ways depending on the environmental stressors.

The framework cautions that various unknown stressors can influence the clients and disrupt their wellbeing. A suitable system stability is necessary to balance the negative effects of the stressors on clients – the model calls the means of interaction between stressors and clients as line of defense (LOD). Using NSM, petitioners monitor the client's LOD levels and interpret negative deviations from the set standards to provide the best way of providing lasting solution to the problem. The model further claims that clients have lines of resistance (LOR) that seeks to maintain mental and environmental stability. Therefore, NSM concepts provide basic guidelines that practitioners can use to provide preventive measures to the environmental stressors. According to NSM, key elements are central core, flexible defense line, normal defense line, and lines of resistances.

Normal line of defense stabilizes the central core; provide basic needs, and protection of the central core elements. Shiftwork, recovery time, and limited family time are some of the stressors that could affect nurses' normal well-being or rather normal line of defense. When the three variables exceed the system's protective agents and disrupt the central core line of defense, nurses may feel intense desire to leave their place of employment or the nursing profession all together. According to Fawcett & Gigliotti (2001), stressors exceed through the flexible line of defense to disturb the equilibrium of an individual thus triggering a series of reactions. Resultantly, the reactions may either restore or decline stability depending on the internal line of resistances. Lines of defense in NSM can prevent stressors from penetrating the stability levels. Figure 2 shows the Conceptual Framework of this study. This framework is formulated based on the NSM model application in the effect of long shift working hours.

Figure 2. Schematic Diagram of Conceptual Framework



The model was used as basis in determining and analyzing the effect of work duration and work shift to the nurses' perceptions toward their profession. Thus, the study was able to come up the major research question of this study which is the relationship between work characteristics and the perception of the nurses. Specifically, the study considers the duration of shift and work shift as the independent variables. On the other hand, the nurses' dependent variable is the nurses' perceived job satisfaction, intent to leave, interest to have overtime, discomforts and opportunity to socialize. Based on NMS model, the null hypotheses of this research points out that there is no significant relationship between the work shift and duration of shift with the dependent variables. This study will also prove that there is no significant relationship between the work characteristics and the nurses' work-associated discomforts.

3 . Materials and Methods

3.1. Research Design

The study utilized cross-sectional correlation descriptive research design. Through the use of correlational design, the research questions can be addressed and developed appropriately for the group characteristics which are most strongly correlated with the attributes or variables of interest (Curtis, Comiskey, & Dempsey, n.d.).

To achieve the aims of this study, it follows the purpose of correlation which is to determine whether the increase in the traits of the variable can lead to the either increase or decrease of other variables. Correlation was used to establish relationship between the respondents' health complaints with work shift and duration of work shift. Similar analysis was done with perceived job satisfaction, intent to leave, intent to participate in overtime, and opportunity to socialize.

3.2. Sampling

The study was conducted in a medical city in Riyadh, Saudi Arabia. As of 2016, the facility has four functioning hospitals with a total bed capacity of 1,100. A total number of 2, 676 nurses were working in the main hospital, maternity hospital, children hospital, and rehabilitation hospital. The main hospital is comprised of four centers or institute which include neurology, cardiology, cancer, and obesity-endocrine-metabolism. The study utilized Power Analysis through Raosoft incorporated for the calculation of the sampling size which resulted to 337 staff nurses. In the calculation sample, the margin of error is 5%, the degree confidence is 95%, with the response distribution of 50%.

In this study, 500 questionnaires were distributed to ensure adequate number of samples in relation to the targeted sample size. In the final data collection, 419 questionnaires were returned with complete answers giving 83.8% response rate. Thus, the sample size for this study exceeds the estimated calculated sample size.

Inclusion and exclusion criteria was used for the participants. The staff nurses included were those working in the selected medical city, and licensed to practice nursing in Saudi Arabia. Staff nurses who work in other hospitals or medical cities in Riyadh were excluded from the study. Also, respondents who did not complete the survey were omitted from the final sample.

3.3. Instrument

A survey held by a self-report questionnaire taken from the study *Negative Impacts of Shiftwork and long Work Hours* was used as research instrument. The use of the tool was approved by the author Boniface Muindi. The questionnaire covers the work characteristics of the respondents in relation to their shift. These include the duration of shift expressed in hours and the work shift whether as morning (AM) or evening (PM).

The nurses' job satisfaction is rated according to a scale of 1 to 4, where 4 expresses the highest level of satisfaction. On the other hand, 1 means the nurse is least satisfied with the nursing job. The intent to leave was determined by their perception as to they either agree or disagree to more likely stay in the organization for another year. The nurses' discomforts were also explored as to whether they experience or feel tired, fatigue, sleepy, moody, back pain, and digestive problems at the end of their work shift. The nurses were also asked of their perspective as to reduce the shift hours, participate in overtime, and whether this affects their opportunity to socialize.

3.5. Data Gathering

After securing approval from the institution, letters were sent to the nurse managers of the unit to ask for assistance in the data gathering. A pilot study was conducted with 20 nurses from the same medical city. The pre-test was done to identify potential problem areas and deficiencies in the research instruments and protocol prior to final data gathering. To test for validity, face validity was utilized to assess the quality of items in the questionnaires. The respondents took an estimated 5-15 minutes duration to judge and fill up the descriptive survey questionnaires. Despite that the items only covered 8 descriptive questions, there were very few items which were unanswered or missed. Modified questionnaires were prepared for final data gathering, edited for some questions needed further clarifications. Those questionnaires were distributed to the different areas in the four hospitals, and four health centers of the selected medical city. No reliability tests were implemented since the items in the questionnaires are descriptive with few items that are presented as open-ended questions. The nurses were recruited by invitation by the researcher together with the nurses' managers and other staff. The respondents were oriented of their rights to withdraw at any point in the data gathering. They were also instructed on how to complete the items in the tool. After completion, the research assistant collected the questionnaires and set them in designated boxes.

3.6. Statistical Analysis

Both descriptive and inferential statistical tools were used in analyzing the quantitave data through the Statistical Package for Social Sciences or SPSS Ver. 21. Descriptive statistics used were percentage,

frequency, and mean. Correlational analysis was done using spearman rank correlation and contingency coefficient.

3.7. Ethics

The research proposal was submitted to the Institute Review Board of the selected medical facility for ethical clearance and approval for data gathering. The approval came with conditions which the author of this research has complied. The study secured informed consents from the respondents. The respondents were oriented of the details of the research and the expected code of conduct. Prior to the actual survey, the respondents were asked if they have concerns to set the mood for data gathering and facilitate full participation in completely answering the items.

4. Results

Due to the presence of various stakeholders who might find the report interesting, findings are presented in different forms based on their needs. Analysis was carried out to assess the significant differences of the nurses' perceptions towards their work according to their assigned work shift and the duration in hours. The abbreviations used for descriptive analysis are Mean (M), Standard Deviation (SD) and Frequency (f) whereas for inferential statistics is (P value) for probability. In addition, symbols are (%) for percentage and (*) for the reports on the distribution of nurses according to selected categories. The aim of the study was to answer the following questions:

- What are the characteristics of the nurses according to work shift, duration of shift, and overtime?
- Is there a correlation between the nurses' duration of shift with their perceived job satisfaction, intent to leave, interest to have overtime, and opportunity to socialize?
- Is there a significant relationship between discomforts experienced by the nurses with the work shift and duration of shift?

4.1. Characteristics of the nurses according to work shit, duration of shift, health impact, satisfaction, and overtime

There were 419 out of the 500 Registered Nurses (RNs) who completed the questionnaire. The response rate was therefore approximately 83.8%. According to the questionnaire, (57.3) of the correspondents worked in the morning shift while the rest worked in the night one.

As Table 1 shows, the majority, 408 out of 419 (97.4%) of nurses, followed the 12 hours shift which is customary in the hospitals in Saudi Arabia. In Saudi Arabia, it is mandatory for nurses to end their duration for shift after 12 hours. However, several nurses answered 9 hours (1.4%) and 10 hours (1.2%) as their duration of shift. These nurses consider their working period as the number of hours they completed their assigned tasks for the day, thus several respondents answered less than 12 hours.

Table 1. The duration of shift of the staff nurses

What is the length of your shift?	Frequency	Percentage (%)
9 hours	6	1.4
10 hours	5	1.2
11 hours	0	0.0
12 hours	408	97.4
Total	419	100.0

When they were asked about reducing the shift hours, 45.1% agreed – some agreed to reduce it to 8 hours, others agreed to 6 hours while others suggested to have 2 days off after 2-3 days on duty.

Also regarding to duration of work, majority of the nurses (50.2%) agreed that their job has affected their opportunities to have social life. However, (45.3%) disagreed and thought that they still have extra time based on their current working hours and schedule. About 4.5% of the nurses were still undecided as to whether their nursing work had affected their social life.

Regarding to a question about encountering overtime hours, (90.9 %) of the nurses have not encountered overtime. For those who experienced overtime, 11 nurses (2.6%) had 12 hours,

Whereas others have had either 1 (2.1 %), 2 (2.1%), or 3 (2,1%) hours only. When they were asked about their willing to participate in overtime, results had shown that (52.7%) were not willing to participate in overtime. However, several nurses (43.0%) like overtime for different reasons. The remaining nurses (4.3%) were still undecided and were willing to help or be included in the overtime when needed.

Another question included in the survey was about the nurses' satisfaction toward their perceived job. The majority of correspondents (36.3%) were moderately satisfied, followed by (25.5%) for those who are satisfied with it, (21.5%) were not satisfied with their job in their current workplace. And the least percentage (16.7%) for those who were highly satisfied as Table 2 clarifies.

Table 2. The perceived satisfaction scale of the nurses.

In a scale of 1 -4 where 4 represents the most approval, do you feel satisfied with job	**f**	**%**
Not satisfied	90	21.5
Satisfied	107	25.5
Moderately satisfied	152	36.3
Highly satisfied	70	16.7
Total	419	100.0

Moreover, when they were asked about their intention to leave the organization, nearly half nurses (55.4%) claimed their intention to leave the for the incoming year. In contrast, (43.7%) decided to remain in organization. The remaining nurses (0.9%) were still indecisive to be among those nurses who will be part of the turnovers.

The nurses complained of several discomforts which they typically experience after completing their entire work shift. Majority (84.2%) felt tired after working in their assigned areas.

Other nurses mostly complained of either back pain (62.1%), fatigue (60.0%), or sleepiness (44.9%). The least complaints were getting moody (31.4%) or having gastric upsets after work (29.6%) Table 3.

Table 3. The health complaints of the nurses after every shift.

I feel the following after completing my shift	f	%
Tired		
Yes	353	84.2
No	66	15.8
Fatigue		
Yes	254	60.6
No	165	39.4
Sleepy		
Yes	188	44.9
No	231	55.1
Moody		
Yes	132	31.5
No	287	68.5
Back pain		
Yes	260	62.1
No	159	37.9
Digestive problems		
Yes	124	29.6
No	295	70.4

4.2. Correlation between the nurses' duration of shift with their perceived job satisfaction, intent to leave, interest to have overtime, and opportunity to socialize.

The relationship between nurses' job satisfaction with the duration of shift is shown in Table 4. At 0.05 level of significance, results showed that there was a significant negative relationship between nurses' duration of shift and their satisfaction rating with correlation value of -0.119 ($p < 0.05$). Therefore, nurses who had longer work hours showed poor job satisfaction rating, while nurses with shorter work hours had high job satisfaction rating**.**

Table 4. Relationship between nurses' duration of work and satisfaction rating

Variables	**Spearman Rank**	**P value**	**Remarks**
	Correlation Value		
Relationship between nurses' length of work and satisfaction rating	-0.119	0.015	Significant

In Table 5, at 0.05 level of significance, there was a significant association between nurses' duration of shift and their intention to leave the organization with contingency coefficient of 0.183 ($p<0.05$). Moreover, results revealed that a higher proportion of respondents who work 12 hours responded "Yes" while lower proportion of respondents who work 9 to 10 hours responded "No". The results suggested that nurses who worked 12 hours were more likely to leave the organization than nurses who worked 9-10 hours.

Table 5. Relationship between nurses' duration of work and intent to leave

		Do you see yourself leaving the			
	Duration of Work	**organization in the next one year**			**Total**
		Yes	No	Maybe	
	9.00	0	6	0	6
	10.00	0	5	0	5
	12.00	232	172	4	408
	Total	232	183	4	419
	Contingency Coefficient=0.183		P value = 0.006		Significant

Duration of Work	**Do you willingly participate in overtime?**			**Total**
	Yes	No	Neutral	
9.00	2	4	0	6
10.00	0	5	0	5
12.00	178	212	18	408
Total	180	221	18	419
Contingency Coefficient=0.111		P value = 0.268		Not Significant

As shown in Table 6, at 0.05 level of significance, there was no significant association between nurses' duration of shift and their intent to participate in overtime with contingency coefficient of 0.111 (p value=0.268).

Table 6. Relationship between nurses' duration of work and intent to go overtime

Table 7 revealed, at 0.05 level of significance, that there was no significant association between nurses' duration of shift and overtime affected their social life with contingency coefficient of 0.127 (p value=0.143).

Table 7. Relationship between nurses' duration of work and time for socialization

	Do you feel that your working hours affect			
Duration of Work		**your social life?**		**Total**
	Yes	No	Neutral	
9.00	4	2	0	6
10.00	0	5	0	5
12.00	206	183	19	408
Total	210	190	19	419
Contingency Coefficient=0.127		P value = 0.143		Not Significant

4.3. Correlation between discomforts experienced by the nurses with the work shift and duration of shift.

As shown in Table 8, there is a significant association between nurse's work shift and sleepiness with contingency coefficient of 0.113 ($p<0.05$). As shown in the table, higher proportion of nurses in the PM shift felt sleepy, while higher proportion of nurses in the AM shift do not feel sleepy. This implied that nurses on PM shift were more likely to be sleepy than those nurses working on AM shift. Furthermore, there was a significant association between nurses' work shift and gastric upset with contingency coefficient of 0.207 ($p<0.05$). As shown in the table, higher proportion of nurses whose shift were PM felt gastric upset compared to those whose shift were AM. This implied that nurses whose shift were PM were more likely to feel gastric upset than those nurses whose shift were AM. On the other hand, there was no significant association between nurses' work shift and feeling tired with contingency coefficient of 0.042 (p value=0.386). The same can be said with fatigue, moody and back pain.

Table 8. Relationship between nurses' work shift with discomforts felt after shift

					Contingency	P	Remarks
I feel the following after completing my shift		**Work Shift**			**Coefficient**	**value**	
		AM	PM	**Total**			
Tired	No	41	25	66			Not
	Yes	199	154	353	0.042	0.386	Significant
Total		240	179	419			
Fatigue	No	90	75	165			Not
	Yes	150	104	254	0.044	0.362	Significant
Total		240	179	419			
Sleepy	No	144	87	231			
	Yes	96	92	188	0.113	0.020	Significant
Total		240	179	419			
Moody	No	173	114	287			Not
	Yes	67	65	132	0.089	0.067	Significant
Total		240	179	419			
Back Pain	No	86	73	159			
	Yes	154	106	260	0.050	0.302	Not
Total		240	179	419			Significant
Gastric Upset	No	189	106	295			
	Yes	51	73	124	0.207	<0.001	Significant
Total		240	179	419			

Regarding the duration of work shift, Table 9 shows that there is a significant association between nurses' duration of work shift and most discomforts, from pain to fatigue, sleepiness, being moody and gastric issues, and that these who work in the 12 hours shift are more likely to experience all mentioned discomforts.

Table 9. Relationship between nurses' duration of work shift with discomforts felt after shift.

		Duration of work				**Contingency**	**P value**	**Remarks**
I feel the following completing my shift		**shift (hours)**			**Total**	**Coefficient**		
		9.00	10.00	12.00				
Tired	No	0	0	66	66			Not
	Yes	6	5	342	353	0.071	0.348	Significant
Total		6	5	408	419			
Fatigue	No	6	5	154	165			
	Yes	0	0	254	254	0.200	<0.001	Significant
Total		6	5	408	419			
Sleepy	No	6	0	225	231			
	Yes	0	5	183	188	0.160	0.004	Significant
Total		6	5	408	419			
Moody	No	6	5	276	287			Not
	Yes	0	0	132	132	0.111	0.074	Significant
Total		6	5	408	419			
Back Pain	No	6	5	148	159			
	Yes	0	0	260	260	0.205	<0.001	Significant
Total		6	5	408	419			
Gastric	No	6	5	284	295			
Upset								Not
	Yes	0	0	124	124	0.106	0.093	Significant
Total		6	5	408	419			

5. Discussion

Similar findings were shown in the study of Han, Trinkoff and Gurses (2015); and, Alotaibi, Paliadelis, and Valenzuela (2016). The study conducted by Han, Trinkoff and Gurses (2015) among nurses from two states in America found that nurses were also found to be significantly dissatisfied with their job when they work in longer hours. Similar results were also observed in a study conducted among nurses in Saudi Arabia. Alotaibi, Paliadelis, and Valenzuela (2016) proved that the long working hours of nurses was perceived by them as dissatisfying. According to the staff nurses, work overload and time pressure may result from the low nurse-to-patient ratio in Saudi Arabia. The current ratio is four nurses per 1000 people. At present, no existing literatures contradicts the finding of this study which is disaffections towards nursing jobs most likely occur in long working hours.

Nurses working for 12 hours are more likely to leave the organization than nurses who work 9-10 hours. This finding are relevant to the study of Han, Trinkoff and Gurses (2015); and Al-Ahmadi (2014). Han, Trinkoff and Gurses (2015) discussed that the longer hours of working is associated with nurses' job dissatisfaction which explained the increase turnovers of nurses.

In this study, nurses who are more likely sleepy are those working for 12 hours and assigned in the night shift. The results about sleepiness among the respondents can be explained by similar studies done by Ashutwi (2001); Eldevik et al. (2013); and, (Akerstedt, 1988). Ashuwiti (2001) also found that the Saudi nurses' sleepiness are more experienced by those in the night shift compared to the morning shift. The study discussed that Saudi nurses' sleep insufficiency occurs when family conflict arises with work. In this study, most of the respondents claimed that they spend less time gathering with friends and joining socialization activities. A study showed a different result conducted by Demir Zencirci and Arslan (2011) wherein no differences in experiencing sleepiness between nurses in either morning or evening shift. However, the study reported that when nurses are in rotating shifts, instead of long morning or evening shifts, feeling sleepy will most likely occur.

This study found that work shift has been found to be correlated with fatigue and more likely among staff nurses in the night shift. Similar to the study of Eldevik et al. (2013),

The night shift nurses in Norway experience short rest between duties were frequently complaining of excessive fatigue. Gumenyuk, Roth, and Drake (2012) explained that the incomplete adaptation to circadian rhythm is associated with work shift. Furthermore, the disturbance in sleeping patterns among night shift nurses are part of the shift syndrome which occurs due to affectation of the biological circadian rhythms of the body (Costa, 2010). At present, no researches contradicts this finding which showed that nurses in the morning shift suffer from fatigue than those in the night shift.

Also, this study found out that night shifters were more likely to develop digestive problems or gastric upsets. According Reppert and Weaver (2002), the inversion of sleep-wake cycles with modification in activity and rest is considered as stress to the circadian rhythm of biological functions especially among diurnals.

Work-related stress due to the misalignment of the circadian rhythms can lead to shift lag which include the feeling of digestive troubles (Costa, 2010). Ulcer is more prevalent among night shift workers due to the compromise of the natural defense by the gastric function (Pietroiusti et al., 2006). Back pain was also commonly reported by nurses working in 12 hours shift compared to than those nurses who work in 9 to 10 hours. Low back pain is common among nurses which at time include the back of the neck and the shoulders (Alexopoulos et al., 2003). Trinkoff et al. (2006) explained that the low back pain among nurses with longer shift duration are more likely due to physical demand and not psychologic. The nursing work is physically demanding which require the nurses to heavy lifting, bending and twisting, and other awkward postures which increases their risk to musculoskeletal disorders (Yip, 2001).

Hence, this research emphasizes the need to protect nurses' health, especially those in night shifts. Health promotion is also recommended by the researchers for the preservation of nurse shift workers. Thus, the interferences of work shift and duration on health and well-being are complex and multifaceted. These variables can impact nurses' discomforts, relations with personal characteristics, and their working and living conditions.

6. Conclusion

Staff nurses working for over 12 hours are less satisfied with their job and more likely has the intention to leave the organization. The health discomforts experienced by the staff nurses at the end of the shift varies more likely according to their work shift than duration of shift.

The study found that the duration of shift was found to impact job satisfaction, turnover, feeling of sleepiness, and experiencing gastric discomforts.

7. Recommendations

7.1 Recommendations for Nursing Administration

It's recommended that adding short breaks and giving nurses time off are relatively modifiable factors that demonstrate respect for nurses to socialize and care for their self and own needs, which can help reduce the turnover rates of nurses in Saud Arabia.

The present study recommends the organization to revisit and strengthen their policy and compliance to the standards nursing practices through the development of interventions aimed at creating better work environments despite the long work shift by the nurses. A better environment can help nurses perform their jobs.

7.2 Recommendations for Nursing Education

Education plays a vital role in preparing student nurses adapt to their future career. This study recommends clinical teaching methods that aims to develop the nurses' adaptive skills to face clinical challenges in relation working for longer shifts in health care facilities.

7.3 Recommendations for Nursing Practice

Is recommended that the organization must explore the concerns of the nurses regarding stress-induced discomforts which can be attributed to longer working hours. It is recommended that interventional programs should be implemented to identify and relieve sources of stress such us work shift and duration of working hours so that nurses would be comfortable and their job performance will be satisfying.

7.4 Recommendations for Nursing Research (Future Research)

The present study recommends a larger sample size from different regions in Saudi Arabia to achieve accurate representation of the responses of nurses toward long work shift.

Other research methods are recommended, such as qualitative approach, to gain deeper insight on the influence of duration of work to nurses' satisfaction, turnover, discomforts and deliver of quality nursing care.

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