

**An –Najah National University**

**Faculty of Graduate Studies**

**Effect of Shift Work Paradigms on Job Performance of  
Nurses in the Palestinian Health Sector**

**By**

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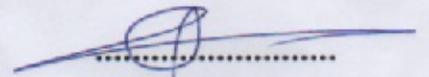
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Finally, I would like to dedicate this work to my lovely son "Ghaith".

**Thank you all,**

## الإقرار

انا الموقع ادناه مقدم الرسالة التي تحمل العنوان:

### **Effects of Shift work Paradigms on Job Performance of Nurses in the Palestinian Health Sector**

أقر بأن ما اشتملت عليه الرسالة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وان هذه الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل أي درجة علمية أو بحث علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

### **Declaration**

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

**Student Name:**

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التوقيع:

**Date:**

التاريخ:

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## **Abstract**

With the growing number of people in the world in general and in Palestine in particular, the need to provide medical services to them and work on the upgrade and improvement of these services has emerged, among the most important factors that guarantee the provision of these services with a high level is provided around the clock, and so responsible parties adopted the system of shift work. One of the main problems faced by shift work system is suffering of workers in this sector of psychological, social and health problems, in addition to the occurrence of medical errors and their exposure to accidents while doing their job.

In this study problems caused by working in shifts for nurses working in Palestinian public and private hospitals were highlighted, in addition to the discussion of the criteria nurses working in shifts system are selected accordingly, the study also addresses sleep problems and insomnia caused by working in shifts, part of the study has been allocated to look at the factors that control the size of work pressure between the different shifts, the final part of the study, discusses employee satisfaction financially and morally.

The results show the suffering of nurses working shifts of health problems that may be chronic diseases or exposure to successive healthy setbacks,

psychological and social problems have emerged so much where they suffer from isolation and weakness in social relations, the results also showed a lack of standards nurses working in shifts are selected on the basis of and when the distribution shifts among them.

During the study, the analysis of each of the previous problems conducted through a comparison between nurses working in shifts and nurses who work in one shift. As these problems have been analyzed according to several demographic variables such as age, sex and other.

# Chapter One

## Introduction

### 1.1 General Background

Recently, the need of shift work has significantly increased as a result of high cost of machines and production lines equipment, increase of the demand on services and products at all sectors. Furthermore, technology logic advances, changes in economy and emergence of 24 hour societies contributed to increase of the need for shift work.

(Kroemer. H, Kroemer.K, et al., 2001) defined shift work as: one speaks of shift work if two or more persons, or teams of persons, work in sequence at the same workplace. Often, each worker's shift is repeated in the same pattern over a number of days. For the individual, shift work means attending the same workplace either regularly at the same time (continues shift work) or at varying times (discontinuous, including rotating, shift work). There are two common approaches of shift work; 8-hour shift and 12-hour shift, which are considered as the right choice with few restrictions such as moderate stress, simple tasks (free activities) and free time between shifts should not be less than 16 hours to adopt the approach of 12-hour.

Shift work has a lot of consequences that affect the performance of workers at both professional life and social life, (Performance defined as: The accomplishment of a given task measured against preset known

standards of accuracy, completeness, cost, and speed. In a contract, performance is deemed to be the fulfillment of an obligation, in a manner that releases the performer from all liabilities under the contract) as Cosmetatos G.P, Eilon S, 1993 mentioned in their paper. Unfortunately, shift work leads the worker to work against his/her body's natural rhythms and this will cause accidents, fatigue and tiredness, and these consequences usually accumulate with age. In most industrialized countries, approximately one-third of the population has some forms of shift work, above 5-10% of population have shift work that includes night work. There is, however, a clear trend towards more widespread shift work because of the strong trend in society toward around-the clock production and service (Glass. L, Aronson K, 2011). On the other hand, (Bambra, Whitehead, et al, (2008)) mentioned that shift work continues to be commonplace among healthcare and emergency-services personnel with up to 50% of hospital staff working on shifts.

A study by (Glazer, Gyurak, (2008)) tested the sources of stress among nurses in five countries; Hungary, Israel, Italy, U.K and U.S. The study ranked these stress sources and the results are tabulated in Table 1. This study showed the difference between sources of stress in each country according to country culture and conditions which mainly concentrated in difficult working environment, sleepiness, social, psychological and health problems.

**Table 1: Stress sources ranking in five different countries**

<b>Rank</b>	<b>U.S.</b>	<b>Hungary</b>	<b>Israel</b>	<b>Italy</b>	<b>U.K.</b>
1st	Lack of staff	Lack of resources	Quantitative workload	Lack of staff	Lack of staff
2nd	Quantitative workload	Death	Lack of staff	Quantitative workload	Leadership
3rd	Leadership	Time pressure	Type of patients	Leadership	Co-workers
4th	Co-workers	Interaction with patients and relatives	Psychological	Type of patients	Quantitative workload
5th	Death	Staff shortage	Health problems	Psychological	Time pressure
6th	Type of patients	Quantitative workload	Interaction with patients and relatives	Co-workers	Type of patients
7th	Time pressure	Type of patients	Co-workers	Lack of resources	Lack of resources
8th	Lack of resources	Co-workers	Leadership	Time pressure	Psychological
9th	Interaction with patients and relatives	Psychological	Death	Interaction with patients and relatives	Negative rewards
10th	Negative rewards	Leadership	Time pressure	Death	Interaction with patients and relatives

## **1.2 Problem Definition**

### **1.2.1 Overview**

The Ministry of health (MOH) in Palestine provides free health services for all segments of the Palestinian society and is constantly working on improving its services. MOH charges 900 NIS as annual fees from 130,000 government employees that do not cover their expenses as mentioned in an article of Al-Quds newspaper in June, 2011. Besides, Wafa Agency mentioned in a statistical survey conducted in 2011 that the total number of hospitals in West Bank equals to 45 public hospitals with capacity of 3,803 beds, 11 private hospitals, with capacity of 822 beds, 16 birth hospitals with capacity of 316 beds and 706 health centers. Also, the statistical studies compare between resources availability and usage in the Palestinian hospitals and those in neighboring countries. In particular, they mentioned that the number of nurses equals to 50 nurses per 100,000 citizens, while number of beds equals 50 beds per 100,000 citizens, whereas the number of doctors equals 8.9 per 10,000 citizens and 15 employee in medical support occupations per 100,000 citizens as mentioned in the Independent Commission for human rights mentioned in their annual report in 2009.

Al-Quds newspaper article mentioned also the types of training that the employees of Palestinian health care sector have to receive including practical training, self training, and training through workshops and

conferences. National strategic plan (2008-2012) also addressed the issue of human resources working in Palestinian health care sector that equal to 40,000 could be divided as follows: 8048 doctors, 2035 dentists, 3842 pharmacist, 6652 nurses, 10521 medical support occupations and 7520 administrators. Furthermore, human resources in the Palestinian health sector, as Shalabi Y and Ladadweh H, (2007) mentioned in their study, suffer from lack of job descriptions and organizational structures, The study also mentioned lack of systems and references related to behavior of employees during service delivery, also it was clear that employees do not receive courses in dealing with the public that affect the level of service provided to citizens.

Under the above-mentioned nature of the Palestinian health sector, shift work has been a regular and an indispensable norm of work in health care sector in the Palestinian society because of the nature of the services provided by this sector. In the sequel, it is worthy to highlight many aspects related to shift work effects and problems on nursing personnel job performance in the Palestinian health sector and to find solutions for them. More specifically, job-related physical and mental stresses appeared in nurses working in the Palestinian health care sector according to various shift schedules will be investigated in this study.

The above-mentioned statistics clearly reflect suffering of nursing staff in Palestine due to a lack of available resources and the difficult work conditions. Work-related stresses are considered as very influential factors

because nurses have to provide services throughout the day and without interruption and this force them to adopt shift work system in three consecutive shifts daily. Several studies examined both long term and short term negative effects of shift work on nurses and their job performance in private and public Palestinian hospitals. Specifically, such negative effects include, but not limited to, physical and health problems (cardiovascular, pre-term births, breast cancer...) and social and mental problems (loneliness, isolation, difficulties in family interactions...). These problems will be addressed thoroughly in our research hypotheses in order to come up with some recommendations for reducing/eliminating such problems among nurses in the Palestinian health sector.

### **1.2.2 Research Questions**

This research aims to clarify the problems resulted from shift work of nurses personnel in the Palestinian health sector and to suggest solutions for these problems through finding answers for the following questions:

- 1-What are the main problems of shiftworking nurses in the Palestinian health care sector?
- 2-What are the solutions to such shift work problems?
- 3- Do administration in health care organizations notice these problems? What are their actions to solve these problems?

### **1.2.3 Research Objectives**

The main goal of this research is to discuss the effect of shift work on the performance of shift work employees (nurses) due to fatigue, stress and social problems they encounter as a result of their work in the Palestinian health sector. This research will result in recommendations for improving their working and living. In particular, the research aims at; first, addressing all types of health, social, psychological, and professional problems of shift work that nurses in Palestinian hospitals are exposed to. Secondly, exploring the effect of these problems on the performance of nurses, Thirdly, suggesting feasible and practical solutions to reduce errors, accidents and poor performance of nurses resulted from shift work problems.

### **1.3 Research Importance**

Due to its sensitivity and importance, shift work in healthcare sector has attracted many researchers to focus on aspects that deserve attention and need more investigation. Many studies conducted around the world but what makes this study unique is lack of studies on this subject in the Palestinian health care sector which address the problems caused by working in shifts for nurses in the health sector. Majority of studies that relate to the health sector in Palestine focus on the problems encountered by the sector represented by a lack of personnel, shortages in medicines and lack of medical equipment. However, the problems experienced by nurses are not taken into consideration to address whether they are psychological,

social and health problems affect their performance and quality of services they submit.

In this research, many questions related to nurses problems will be answered for the first time, where many of the problems faced by nurses in all its forms will be identified suggested solutions and recommendations which may reduce these problems will be provided, the research will focus mainly on the problems of shift work and represented by psychological, social and health problems of nurses, errors and accidents, sleep disturbance and fatigue and scheduling of shifts among nurses.

#### **1.4 Thesis Structure**

This thesis consists of five chapters, Chapter One introduce for the subject with a simple explanation about working in shifts in the world and the increasing adoption because of the increased need for such systems, in addition to simple presentation of shift work problems in general with indication to the suffering of the Palestinian nurses.

Chapter Two introduces a literature review and summaries studies that addressed the issue of working in shifts, In this chapter consequent implications as a result of being shift worker have been highlighted in general. Several studies that discussed the work in shifts and the impact on employees in the health sector and nurses in the hospitals have been surveyed, in particular.

Chapter Three represents research hypotheses and previous studies which support the hypotheses formulation. It also provides a summary of the methodology that has been followed in this research. In particular, discussion of how to choose the sample, the questionnaire formulation mechanism, and are given in this chapter the process of data collection.

Chapter Four presents the analytical results of demographic variables showing frequencies and percents of each variable for nurses. Also it gives the major and sub hypotheses results.

Chapter Five gives a brief conclusion about hypotheses results with a summary of recommendations and future research suggestions.

## **Chapter Two**

### **Literature Review**

Many studies around the world have focused on the problems of shift work and the impact of it on the performance of shift workers, where with mounting echo problems caused by this system of work, almost each country in the world of enterprises and institutions adopt this system of work. Therefore, the interest in this topic is no longer the preserve of certain state or sector.

Researchers from different countries all over the world have conducted studies to discuss shift work problems and to suggest solutions for such problems.

In Feb.2000 a group of researchers (Hsberg . A. S., 2000.) conducted a study to examine the effect of shift work at the different dimensions of fatigue, using Swedish Occupational Fatigue Inventory (SOFI). There are five main dimensions of fatigue as defined by (SOFI) that are lack of energy, physical exertion, physical discomfort, lack of motivation, sleepiness. The study was conducted in a paper mill in the south of Sweden, 48 men and 44 women participated in the study, their mean age was 41.3 years. Results showed that all dimensions of fatigue stated in (SOFI) are increasing during the night shift. After analyzing the gender variable it was clear that women are affected by fatigue more than men relating to SOFI dimensions. On the other hand, no gender differences were observed concerning question of sleepiness, this showed that there were no

differences regarding sleepiness between men and women. The results also suggested that taking breaks between shifts may be sufficient for sleep to recover, while it is not sufficient to rest from physical exertion.

A study published in 2011 for (Fritschi L, Tresham L, et al.) focused on the relation of being shift worker and susceptibility to cancer, four main mechanisms were deeply researched which are phase shift, sleep disruption, lifestyle factors and lower vitamin D.

Phase shift; shift work system is working against natural rhythm of cells and organs and the synchronized process of sleep-wake cycle, phase desynchronized happens when workers adopt this sleep system, “Confusion of the master clock, such as when a person does shift work, may thus contribute to asynchronies in cell proliferation which may result in cancer”.

“Sleep disruption; this could be classified into two main issues first, immune suppression which decreases because all studies of poor sleepers resulted that killer cell activity reduces with sleep disruption. Second, melatonin production which increase at night hours when light is absent which night shifts do not allow it to be produced to prevent rat hepatomas and breast cancer.”

Life style factor; many daily habits affected by being shift worker include poor diet, smoking, alcoholism, physical inactivity and obesity which all may result in cancer.

Lower vitamin D; exposure of day light may be less for people who work in shift work than others which result in decrease of vitamin D in their bodies which reduces the chances of developing certain types of cancer.

“Tucker P. and Knowles S.R. (2009) mentioned the Standard Shift work Index (SSI) which was developed in order to address the lack of validated research tools available for the exploration of the complex relations between shift-system design, individual differences, and psychological and physiological health. The SSI consists of six sections, each addressing a specific aspect of shift work. More specifically, section one comprises questions regarding biographical information (e.g., age, gender, marital status), type of shift system worked (e.g., shift start and end times) and job satisfaction (Smith et al., 1989). Section two assesses the effect of shift work on perceived sleep quality and quantity, and fatigue. Section three measures the level of psychological distress (Folkard et al., 1979), while section four assesses the social and domestic aspects of the shift worker’s life which may influence their well-being (e.g., time for family, social activities) (Tucker P. and Knowles S.R. (2009)), Finally, section five assesses how shift workers cope with shift work (Tobin et al., 1984).”

Work in shifts in the health sector had a large share of studies due to the sensitivity and seriousness of this sector and due to the cries of distress from the workers there. Several studies conducted in this regard where

researchers took samples from people working in hospitals and health centers working 24 hours. These studies mentioned the different types of social, psychological and health problems occurred as a result of shift work.

To examine organizational factors affecting the impact of shift work on work life conflict and subjective health a study for (Pisarski, Brook C, et al.) in 2008 targeted 530 nurses working in a large Australian hospital organization that controls several public and private hospitals that provide acute, inpatient adult, pediatric, and maternity services. Researchers have identified three forms of work life conflict: time-based, strain-based and behavior-based conflict.

36% of the 1492 nurses responded to surveys that was distributed. 39 nurses (7%) were male and 491 (93%) were female with a mean of 35 years for their age. Fifty-eight percent of respondents worked rotating 8–10 h shifts that included morning, afternoon and night shifts. 5% worked fixed night shifts, 37% percent worked 8–10 h shifts involving either rotating or fixed morning and afternoon shifts. Several variables were analyzed to link between both physical health and psychological well-being and these variables were (supervisor support, college support, team identity, team climate, control over work environment and Work-family conflict).

The results revealed a set of direct and mediated relationships between social support from supervisors and colleagues, team identity and

climate, control over the work environment, work life conflict, and subjective health.

From the results it was clear the positive relationship between these factors and reducing the work life conflict that resulted in a better life for well beings. “This finding indicates that wider aspects of control over work, not just working hours, have strong positive effects on the work life conflict experienced by shift workers.” Two other additional factors that focus on team climate and team identity were discussed and results came as hypothesized that both physical and psychological variables are positively related to colleagues and supervisors support which will affect their performance positively.

A study for Anderson V.V, 2010 which covered a sample of five nurses mentioned that high percentage of shift workers complain about shift work difficulties and the effect of that on their stability, nurses preferred taking morning shift more than evening and night shifts, since evening and night shifts keep them away from their families. After interviewing these nurses the study resulted that nurses who work in shift work are highly exposed to fall into errors which affect safety of them as well as of their patients. “There are five categories whereby nurses coded the type of errors that they recorded: (1) medical, including incorrect administration in terms of dosage, timing, delivery or patient; (2) charting, including incorrect entry in terms of information, timing or patient; (3) procedural, including any deviations from approved procedures; (4) slip or

fall, including any physical injuries; and (5) others, including errors not falling into any of the other categories.” Nurses are also exposed to personal accidents and injuries resulted from being shift workers so they feel with fatigue, drowsiness while travelling home that increase accidents or near accidents while driving or cycling home.

A study for (Tekindal B, Tekindal M.A, et al. 2012) have been made in a Turkish state hospital focused on the problems usually occurred between nurses and patients, 225 nurses and 222 patients formulated the sample group of this study which addressed examples for nurses problems with their patients they face during their daily dealing with them, such as blaming nurses for poor condition of hospitals, breaking the therapeutic rules that may affect their health, non compliance with doses, patients repeatedly requests without need, lack of patients understanding of specialized details. Other kind of problems that face nurses is dealing with patients relatives as (Kuhlmann B. G, 2004) mentioned in his study, the study conducted interviews with the relatives and other interviews with the nursing staff, study resulted in many problems include inappropriate time for visits, bringing forbidden food, talking with patient, annoying other patients, large number of useless questions that consume nurses time. Also patients and their relatives complained from nurses non responding, medical mistakes, and from being tough with them.

Death is the hardest situation that nurses compelled to act when it occurs, the first thing they have to do is to act wisely in the presence of family members, many nurses build a relationship with them such as attending funerals or posting obituaries. After patients death, some nurses use exercise and relaxation therapies, such as a hot bath, to help getting rid of stress caused by patient death after building strong relations with them especially patients that lying in hospitals for a long period so nurses are dealing with them daily and get used to see them as (Domrose C.) mentioned in her study in 2011.

Beside to work pressure nurses exposed for, they are also required to be responsible for manual or electronic documentation about their patients condition and their medical records, this help them in information delivery between shifts to follow-up their work. This additional task increases the volume of their hard work since they have to be accurate in keeping these sensitive information such as color of the skin, blood pressure, blood glucose readings, respiration rate, temperature, pulse, level of consciousness, dosing schedules, doctors notes and recommendations, a study for (Driscolla T. R. , Grunsteinb R. R. ) in 2007 took a sample size of 933 nurses 59% are working in different hospitals in Maryland state to fill the questionnaire 41% of the sample working in clinics and the rest are working in hospitals, study resulted that 25%-50% of nurses spend their working time to document patients status and records, hospital nurses

reported that hospitals have to pay additional salary for them instead of working beyond normal hours for documentation.

(Fields R.) April, 2012 mentioned that shift work is considered as the most prominent issue that damage employee satisfaction in hospitals. She sorted these issues in a descending order starting with “shift work, then expecting staff to work with minimal breaks from management, bureaucratic hold-ups, invisible leadership, limited opportunities for involvement, hiring staff members who don't fit their positions”.

Sleepiness has a large effect on the performance of nurses, and to avoid this problem and to stay awake especially at night shifts, Functional Energy Drinks (FED) and stimulated drugs are used, but several investigations mentioned for side effects for this using at the long run. (Jay, Petrilli, et al., 2006).

This chapter summarized some previous studies that discussed shift work problems for shift workers and for nurses in particular, these studies constitutes a small part of studies covered this vital topic.

## **Chapter Three**

### **Research Hypotheses and Methodology**

Chapter three stated two main parts of the research, first part summarized hypothesis of the research with the previous studies that have been relied upon in formulating the hypothesis, second part presented in detail the methodology followed in the search.

#### **3.1 Research Hypotheses**

To formulate the hypothesis of our study several previous studies were also reviewed and summarized, Assumptions were reviewed successively and separately, so that each hypothesis addressed a particular issue related to the work of nurses in shifts, based on the findings and outcomes of previous studies. The following discussion presents the formulation of the hypotheses.

1- Shift workers sleep poorly than others, they have difficulties in getting enough sleep hours because of their duties, and the quality of sleep is also poor because of a lot of awakenings and unusual sleep times. Nurses productivity which could be defined as: (Registered or incorporated entity that provides professional services (which generally require a license from a professional body) such as accounting, legal advice, medical care, to the public. Also called professional corporation, as as Cosmetatos G.P, Eilon S, 1993 mentioned in their paper), may decrease and they may exposed to accidents because of sleep disturbances which may have the symptoms of

clinical insomnia. Their circadian system is affected because of the nature of their work and Irregular sleep and being forced to stay awake for long hours and continuously, especially in the night hours.(Akerstedt T, 2009).

Shift work, particularly night work, disrupts the natural circadian rhythm, requiring people to be active at times when they would normally be sleeping, and vice versa. This leads to problems with sleep, their bodies Influenced by many things such as the vital sugar and body temperature and the rate of secretion of melatonin (Bambra, Whitehead, et al, (2008)). Based on thesis discussion, the first hypothesis could be formulated as:

H1-Shift work nurses suffer from sleep disturbances which may lead to be chronic insomnia.

Next it is clearly that shift work has many negative consequences that would increase if the shift worker has inappropriate qualifications to be a shift worker. More specifically, individual differences may not yet be used to select shift workers but individuals above the age of 45 should have a right to transfer to day work to consider their health conditions. Hypnotics may improve daytime sleep to compensate being awake at night hours but should be avoided in the long run because of it's side effects, and to reduce the effect of being sleep at day hours especially when aging, nurses have to take melatonin by bright light exposure or intake of the pineal hormone melatonin instead of taking it naturally (Akerstedt T, 2009). According to the discussion mentioned above, the second hypothesis could be formulated as:

H2-There are certain criteria that should be taken into account upon choosing shift work nurses.

Health problems that result from shift work because of stress, poor diet during shift work, stand for long time, caffeine consumption, and disorder in circadian rhythm. Shift workers are exposed more than other workers to health setbacks such as colds and flu, also exposed for chronic diseases like gastro-intestinal problems such as indigestion or ulcers and more cardiovascular disease such as heart attacks and high fat and diabetes as (Boggild. H, 2000) mentioned in his Phd thesis. Disruption of the circadian rhythm can also lead to disharmony within the body, as some functions (e.g., heart rate) adapt more quickly than others, also other vital functions affected such as body temperature and melatonin production. Previous studies have explored relation between being female shift worker and some physiological aspects such as pre-term births, or breast cancer ( Barnes J. L.,Davies K. S., et al., 2010). According to this discussion, the third hypothesis could be formulated as:

H3-Diverse health problems may appear as a result of shift work.

Due to the nature of working in shifts, many of difficulties face shift workers which prevent them from exercising their normal lives, so they can not find adequate and suitable time to spend with their families, and to practice their hobbies that result in absence of their social life and social relations. In addition, quality child care is almost nonexistent (Goswami R, 2012). Compared with people who do not work in shifts, shift workers do

not have time to spend with their relatives and families or even their friends. Shift worker also can not join any personal activities such as participation in clubs and practicing sports since they are usually geared to the normal day schedule. The lack of regular social contact can lead to feelings of loneliness and isolation. (Canadian Centre for Occupational Health & Safety, 2012). Consequently, our next hypothesis could be formulated as:

H4-Shift work nurses suffer from diverse social and psychological problems due to the nature of their working times.

Being tired and feeling sleepy cause errors and accidents, shift workers are considered as hazard to both themselves and others in these hours. Research from the center for sleep research in Adelaide discussed the effects of sleep deprivation and showed a result related between sleep deprivation and being drunk, results showed that after 17 hours without sleep and being awake person drive as poorly as if he had a blood alcohol level of 0.05 in his blood and after 25 hours of being awake it is the same as a level of 0.10. Shift workers are at a high risk for a sleep-related accident because at the end of their shift they may have been awake for 16 or more hours especially when they have double shift. Studies showed that around of 30% of shift workers in general have had a fatigue- related driving accidents in the previous years because of being fatigued and sleepy after being awake for long hours or for consecutive shifts (Rogers, Hwang A.E. , et al., 2010).

Exposure for accidents is not only the related problem of shift work, shift workers also are exposed to personal injuries and medical errors as performance fluctuates. For example, a review of injuries and errors related to shift work concluded that workers on rotating shift work had a higher risk of injury and having errors than workers on fixed shifts, also the study resulted that longer workdays such as 12-hour are more hazardous than usual 8-hour workday (Bambra, Whitehead, et al, (2008)). Night shifts account for the highest percentage in the opportunity for accidents, personal injuries and having medical errors as (Flo. E, 2013) mentioned in his thesis.

Recently, the latter investigations was extended to search for the immediate causes of fatigue-induced in particular, cars accidents. It was found that the most impact factor was the amount of sleep obtained during the 24 hour before the accident, whereas the length of time driven seemed to play a minor role in causing accidents, driving for long hours does not cause accidents as long as there is sufficient hours for sleeping. Also it was found that most of accidents in 2009 was due to fatigue, caused by reduced sleep and extended work hours resulted from long shifts or double shifts (Akerstedt T, 2009). In this regard our next hypothesis could be formulated as: H5-Errors and accidents may occur as a result of shift work fatigue and stress.

The level of stress nurses are exposed to varies according to many factors that contribute to increase this stress and fatigue. Studies showed that nurses affected by the ward they work in, nurses work in emergency rooms and Intensive Care Units (ICUs) and other hospitals wards with high working pressure are more likely to face health and psychological problems of shift work than other nurses.

Other factors considered to be a pivotal role in working pressure are kind of shift, patients visitors, cooperation between staff in the shift, limited staff resources, and shifts distribution (Scott W.T., Aiken L.D., 2007). Compared to police officers, nurses have a greater risk of being physically or verbally abused at work (Holt, 1999) and as identified by several authors this causes a major impact on psychological trauma, physical injury and possibly death (Arthur L. Frank, 2000). Based on the above discussion, the next hypothesis could be formulated as:

H6-Level of stress shift work nurses are exposed to differs among hospital departments and time of shifts and other factors.

Many studies mentioned volume of side effects resulted from shift work; several efforts appeared to solve these problems and to reduce the noticed impact of shift work.

Taking naps consider as the most effective countermeasure against sleepiness at work, several studies have shown that 0.5-2-h naps taken

during the first part of night will help nurses not to fall in sleeping during the shift (J. Pincombe, A. E. Rogersd, et al., 2011).

Many other interventions were tested to determine the relationship between these interventions and reduce the side effects of shift work. Speed of rotation was tested by examining whether the effect of changing from fast to slow rotation will be positive or not. In each study, the switch from fast rotation consisted of a change from six or seven consecutive shifts of the same type to a minimum of three or four consecutive shifts of the same type then adoption of another type of shift, and not to change it daily, and all reported positive health effects. Other positive intervention was found, and good indicators appeared clearly after testing it, which was removal of shift work rotation and many health indicators improved significantly after the intervention: “(1) sleep quality and duration improved (e.g., sleep required decreased slightly, from 8.11 hours to 7.77 hours, and sleep adequacy and quality of sleep improved); (2) psychological symptoms decreased, and the mean severity of symptoms reduced slightly; and (3) the amount of sickness absence decreased (from a total of 1400 hours in the 6 months before the intervention to 883 hours in the 6 months after the intervention)” (Bambra, Whitehead, et al, (2008)). As for decreasing the shift length resulted in significantly improvement in fatigue levels, emotional exhaustion, social and family life.

Self scheduling for shifts enables individual shift workers to have some control over which shifts they work, when they start work, or when

their rest days occur. “Health and work–life balance outcomes were almost universally improved in all three: there were decreases in absence, fatigue, and complaints about family life recorded in the study, accidents decreased by 20%, opportunities to plan leisure time and social contacts improved and the ability to maintain a work–life balance was improved in the hospital-based study” (Bambra, Whitehead, et al, (2008)).

In the previous study and other studies, another intervention was tested and it was clear that changing direction of rotation from backward (night, afternoon, morning) to forward (morning, afternoon, night) has no effect on shift workers performance, health and social life. After previous discussion the last hypothesis could be formulated as:

H7- A) Taking naps, B) Changing from slow to fast rotation, C) Removal of shift work rotation and D) self scheduling for shifts may be considered as feasible solutions to reduce the impact of shift work.

## **3.2 Methodology**

### **3.2.1 Introduction**

In this part of thesis the methodology that was adopted in conducting this research will be explained via clarifying all sequential steps in where a simple explanation will be provided for each step. All methods and techniques used in their research starting from the process of reviewing literature, questionnaire design, sample size calculation, data collection and

analysis and finally recommendations and conclusion will be highlighted here.

The first step, was the review of several studies on the shift work, the methodologies and the most important issues and problems that have been addressed in shift work-related previous studies. Various studies have been surveyed included several countries and environments, in some of which surveys have been conducted and others have conducted interviews and visits to the nurses and staff working shifts system.

### **3.2.2 Research Types**

Both qualitative and quantitative methods were used in the research methodology, nature of hypotheses and questions to this research has led for that and two categories were emerged where it was not easy to adopt one method, and dispense other, A clear need for integration between the two methods together appeared, uses of qualitative research appear in many different cases and when there is a need for many reasons as mentioned in family health international guide such as: “seeks answers to a question, systematically uses a predefined set of procedures to answer the question, collects evidence, produces findings that were not determined in advance, produces findings that are applicable beyond the immediate boundaries of the study”,(Sofaer S, 2002).

“Qualitative methods provide a depth of understanding of issues that is not possible through the use of quantitative, statistically-based

investigations.” The data that is used in qualitative research come from a range of collection methods. These include: 1. Interviews with individuals, 2. observations of people, places and actions/interactions, 3. the analysis of media (written, spoken, drawn, etc.), 4. content and guided conversations with groups of individuals (focus groups). Each of these approaches to data collection differs in the source(s) of information and what actual tasks the researcher does to collect information, yet all also include the idea of pulling together examples of the content of regularly encountered situations and things”. (Tewksbury R, 2009)

Turning to the quantitative method it must be referred to the benefits and uses of this method, first, it used to test hypothesis, second, obtaining accurate data, third, this method is suitable more than other methods when we deal with huge data ,fourth, it does not depend on the researcher preferences and mood. (Bryman, 2006).

It was necessary to resort to quantitative method, which has enabled the researcher to obtain results and analysis contributed to the study and support role was as effective as the qualitative method. Quantitative method was very helpful since the research targeted large number of people and obtained huge quantity of data.

Clarification of what has been the use of the qualitative method has been conducted through interviews with employees and managers from Ministry of Health, hospital management general directorate in particular and from nursing unit there. During the interviews, some data and statistics

related to research were obtained. This has been briefed on the questionnaire prepared initially, their comments were taken into consideration and questionnaire was modified accordingly.

Other discussion was conducted with nurses association to identify the main problems faced by nurses through their work and the impact of working in shifts on their performance and what are the consequences of shift work.

For a larger amount of information it had to be dealt with a large sample to cover all aspects of research and to answer the questions and hypotheses accurately, large number of the sample led to adopt questionnaire distribution method that will be easier and less expensive than other methods such as interviews.

### **3.2.3 Questionnaire Design**

For a great deal of information and to be able to cover a large sample of nurses, the design of a comprehensive questionnaire to all hypotheses put forward in the search. In order to achieve all objectives of the search that focus on addressing shift work problems and to get nurses suggestions and recommendations to solve these issues.

A small introduction was presented at the beginning of the questionnaire to explain the main objective of the questionnaire for the participants and to insure that the information will be only used for academic research purposes and will be dealt confidentially.

To prepare the questionnaire many methods were followed, it has been relying on the previous studies that focused on the topic of shift work, in addition to defining the problems and the suffering of the nurses working in shifts through interviews with the people of public administration for the management of hospitals and nursing unit, interviews have also been conducted with the heads of nursing in many hospitals to benefit from their experience and to take their comments into consideration. Also, the Palestinian Nurses' Union was contacted for information.

The questionnaire was divided into five main parts; participant demographic information, main part of the questionnaire that focuses on the shift work issue, nurses satisfaction, general questions and open questions such that participants can write their comments, suggestions and observations.

Part one, demographic informations about participants were collected in the first part to help in grouping nurses by gender, age, educational level, workplace, job title, type of shift, years of experience, marital status, monthly salary, no of children, average sleeping hours, break intervals allowed during every shift and smoker or non-smoker.

Part two, included six main sections each section included a number of questions to address a particular issue with 67 as total number of questions, fatigue and sleep disorders, health issues, social and psychological issues, standards that should be followed upon scheduling

nurses to shifts, medical errors and accidents, factors that govern size of workload respectively.

Questions about job satisfaction and working environment were highlighted in the third part focusing on light, ventilation, privacy and furniture at the work place; also some questions were about their moral and financial satisfaction.

General questions were asked in separately in part four addressing several issues as training courses, Palestinian reality and its impact on their work and many other issues.

Fifth part which was the Last part was open-ended question about their suggestions and comments regarding improvement of work situation inside hospitals.

Part two, three and four asked questions and gave the chance for participants to choose answer out of five, for statically purpose each answer had its own score (Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, Strongly Disagree=1).

During preparation of the questionnaire it have been taken into account the simplicity and ease in formulating questions so participants will be able to understand easily. It was moving away from the use of any tough terms or incomprehensible, and also it was taken into account not to have more than one meaning for each question or the possible existence of two answers to the question that leads participants to unambiguous

understanding during their answer, questions was divided into parts, each part interested in a particular issue so as not to distract the participant.

### **3.2.4 Validity and Reliability**

Validity refers to how well a test measures what it is supposed to measure and truthful of research results, (Phelan. C, Wren.J, 2006). Two main types of validity will be highlighted here due to relevancy purposes; Content validity and external validity.

Content validity is the extent to which the elements within a measurement procedure are relevant and representative of the construct that they will be used to measure (Phelan. C, Wren.J, 2006). In this study, the measuring instrument was the questionnaire distributed on nurses, so some procedures have been taken to insure the questionnaire content validity as follows:

Formulations of questions based on the hypotheses contained in the research and were the core which has been in work in order to support. These hypotheses were made based on a literature review of relevant studies and by reference to interviews conducted with the people working in the field of nursing and in several positions.

Some questionnaires have been excluded from the analysis due to incompleteness pattern answers, some questions developed in a way reveals that the nurse filled out the questionnaire without taking into account the accuracy and without understanding content that it is clear

during data entry to Statistical Package for the Social Sciences (SPSS) , what appears conflict of some answers that he had to fill logically and in reasonable manner showing his/ her interest.

Reviewers from different backgrounds have reviewed the questionnaire in terms of clarity and ease of answering questions, in addition to comprehensiveness of questions for all aspects of the subject. Reviewers varied between nurses and teachers in the nursing and engineering faculties. In addition to a statistical expert, also the questionnaire was presented to Ministry of Health; general directorate of hospitals in particular for review.

External validity could be defined as the ability of generalizing the results (Anthony J, James E, et al., 2003). To ensure maintaining external validity in the research, questionnaires were distributed to shift supervisors personally after the interview with the head of nursing at each hospital and explain the importance of the subject for them to ensure the mobilization of the questionnaire accurately. It also was necessary to meet with nurses and explain the nature of the questionnaire and to emphasize the importance of its findings and recommendations that are in their best interest.

Reliability is defined as the extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials (Miller. J. M, 2008).

Cronbach's alpha was an appropriate method to test questionnaire reliability. SPSS was used to calculate the value of this coefficient, this value was used to check the internal consistency with correlation coefficient at 95% confidence level and with a value did not fall below 0.7. This research passed the test with a value of Cronbach's alpha of 0.856 for the whole 86 items.

### 3.2.5 Sample Size Calculation

To calculate the accurate number of nurses that must be randomly chosen to fill the questionnaire, several statistical methods were reviewed to find the suitable one to find the accurate sample. This depending on the research conditions and limitations the most appropriate one was Steven K. Thompson method that dealing with the research case that meets all Thompson equation conditions, (Thompson S.K, 2012).

This method were used to calculate the sample size (n)

$$n = \frac{N * P(1 - P)}{\left[ \left[ N - 1 * \left( \frac{d^2}{z^2} \right) \right] + p(1 - p) \right]} \quad (1)$$

Where:

Total number of sample (N) = 2800 nurses (Was obtained through a meeting with the Ministry of Health Director)

Percentage error (d) = 0.05

Proportion of the property offers and neutral ( $p$ ) = 0.50

The upper  $\alpha/2$  point of the normal distribution ( $z$ ) = 1.96

After solving the equation with these values,  $n$  value was obtained that equal to 338 nurses.

### **3.2.6 Questionnaire Distribution and Data Collection**

Seven directorates were selected for questionnaire distribution (Nablus, Ramallah, Tulkarem, Jenin, Qalqilya, Hebron and Bethlehem), where both private and governmental hospitals were targeted in each directorate as stated in table 150.

Since governmental hospitals are subject supervisory and administrative to the Ministry of Health, the approval to distribute the questionnaires in these hospitals has been taken from the director of hospitals management unit in the ministry, instruction was distributed by Ministry of health to the concerned people in these hospitals to respond and assist in this task, where private hospitals have been preparing their respective private letter to facilitate the distribution of questionnaires.

Coordination with the supervisor of nursing in every hospital where the questionnaires were distributed and collected through him/ her or his/ her help at all sections of the hospital. Most head nurses showed great cooperation, while part of them showed great interest regarding the research especially in private hospitals.

Questionnaires were filled and returned to the researcher to review the completeness and readability. A total of 650 questionnaires were distributed, 580 were filled and returned back that equal 89% as response, 19 questionnaires were excluded due to incompleteness.

## Chapter Four

### Data Analysis

After distributing the questionnaires and collecting them back all data collected became ready for analysis. In this chapter the process of analyzing the data and displaying the results will be stated. The responses of all questionnaires were coded and entered to SPSS software to be analyzed. This program has been used in the analysis as being the most appropriate software to address data in a way show the desired results, using the most appropriate tests to analyze such data.

#### 4.1 Respondents Characteristics Distribution

Demographic and descriptive analysis will be showed to demonstrate distribution of nurses in terms of many variables such as gender, age, educational level, workplace, years of experience, marital status, number of children, monthly salary, sleeping hours, break intervals and being smoker. Then each hypothesis and it's related analysis covered in the questionnaire was stated, in addition to a group of general questions at the end of the chapter.

The whole sample was 561 valid questionnaires that have been analyzed and divided into two groups resulted in 410 nurses who work more than one shift (rotating shifts) and called the **first group** in the analysis, while 151 out of 561 work one shift without any rotation but their shifts may be

evening or night shift and not necessarily morning shift and called **second group** in the analysis.

These demographic results were summarized in two tables contain all statistics in appendix C (Table 140: Demographic analysis for nurses work more than one shift, Table 141: Demographic analysis for nurses work one shift).

Table 2 shows the distribution of nurses by shifts.

**Table 2: Distribution of nurses by shifts**

Whole Sample	More than Shift	One Shift
561	410	151

When the following tables were stated, missing answers and values were excluded from each table.

#### **4.1.1 Below demographic analysis for 410 nurses who work more than one shift will be shown.**

##### **Gender**

Table 3 below shows that 54.6% of the sample is females while 45.4% Males.

**Table 3: Distribution of the first group of nurses by Gender**

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent%</b>
Female	221	53.9	54.6
Male	184	44.9	45.4

**Governorate**

Table 4 below shows the distribution of nurses over governorates, the highest percent in Hebron while the lowest in Qalqilya.

**Table 4: Distribution of the first group of nurses by Governorate**

<b>Governorate</b>	<b>Frequency</b>	<b>Valid Percent%</b>
Qalqilya	36	9.3
Tulkarem	41	9.5
Jenin	55	13.5
Ramallah	60	14.8
Nablus	70	16.3
Bethlehem	48	12.8
Hebron	97	23.8

## Age

As shown below 54.5% of the sample their age between 25-35, while only 2.4% their age is more than 47 years old.

**Table 5: Distribution of the first group of nurses by Age**

Age	Frequency	Valid Percent%
Less than 25	105	25.7
25-35 years	223	54.5
36-46 years	71	17.4
More than 47	10	2.4

## Education Level

Education status is shown in Table 6, almost 95.4% of the sample has either diploma or B.A degree.

**Table 6: Distribution of the first group of nurses by Education Level**

Educational level	Frequency	Valid Percent%
Below high school	1	.2
Diploma	217	53.1
B.A	173	42.3
Master or More	18	4.4

## Workplace

53.2% are working in Governmental hospital, 43.9% in Private hospital while only 2.9% are working in both.

**Table 7: Distribution of the first group of nurses by Workplace**

Workplace	Frequency	Valid Percent%
Governmental hospital	218	53.2
Private hospital	180	43.9
Both Gov. and Prv.	12	2.9

## Years of Experience

Years of experiences is shown in Table 8, almost 45% of the sample got less than 5 years of experience.

**Table 8: Distribution of the first group of nurses by Years of Experience**

Years of Experience	Frequency	Valid Percent%
Less than 5 years	184	44.9
5-10 years	124	30.3
11-15 years	53	12.9
16-20 years	35	8.5
More than 20 years	14	3.4

## Marital Status

67.5% of the Nurses are married; table 9 shows the marital status.

**Table 9: Distribution of the first group of nurses by Marital Status**

Marital Status	Frequency	Valid Percent%
Single	129	31.5
Married	276	67.5
Divorced	2	.5
Widow/er	2	.5

## Smoking

26.4% of the nurses are smokers while the rest are not.

**Table 10: Distribution of the first group of nurses by Smoking**

Smoking	Frequency	Valid Percent%
Yes	105	26.4
No	293	73.6

## Average sleeping hours

The average sleeping hours is 6.1 hours (383 nurses answer this question out of 410).

### **Break Interval**

Table 11 shows the break interval allowed during every shift, 60.2% got less than 15 minutes break, while 5.3% got more than 30 minutes.

**Table 11: Distribution of the first group of nurses by Break Interval**

<b>Break intervals allowed during every shift</b>	<b>Frequency</b>	<b>Valid Percent%</b>
Less than 15 minutes	237	60.2
16-30 minutes	136	34.5
More than 30 minutes	21	5.3

### **Monthly Salary**

60.7% of the nurses their monthly salaries between 2500- 3500 NIS

**Table 12: Distribution of the first group of nurses by Monthly Salary**

<b>Monthly Salary</b>	<b>Frequency</b>	<b>Valid Percent%</b>
Less than 2500 NIS	123	30.2
2500-3500 NIS	247	60.7
More than 3500 NIS	37	9.1

**4.1.2 Below demographic analysis for 151 nurses who work one shift will be shown.**

**Gender**

Table 13 below shows that 53% of the sample is females while 47% Males.

**Table 13: Distribution of the second group of nurses by Gender**

Gender	Frequency	Valid Percent%
Female	79	53.0
Male	70	47.0

**Governorate**

Table 14 below shows the distribution of nurses over governorates, the highest percent in Hebron while the lowest in Bethlehem.

**Table 14: Distribution of the second group of nurses by Governorate**

Governorate	Frequency	Valid Percent%
Qalqilya	15	10.2
Tulkarem	21	14.3
Jenin	21	14.3
Ramallah	18	12.3
Nablus	20	13.6
Bethlehem	14	9.6
Hebron	38	25.9

## Age

As shown below 44.3% of the sample their age between 25-35, while only 7.4% their age is more than 47 years old.

**Table 15: Distribution of the second group of nurses by Age**

Age	Frequency	Valid Percent%
Less than 25	24	16.1
25-35 years	66	44.3
36-46 years	48	32.2
More than 47	11	7.4

## Education Level

Education level is shown in table 16, almost 90.6% of the sample has either diploma or B.A degree.

**Table 16: Distribution of the second group of nurses by Education Level**

Educational level	Frequency	Valid Percent%
High school	2	1.3
Diploma	71	47.3
B.A	65	43.3
Master or More	12	8.0

## Workplace

51.3% are working in Governmental hospital, 48.0% in Private hospital while only 0.7% are working in both.

**Table 17: Distribution of the second group of nurses by Workplace**

Workplace	Frequency	Valid Percent%
Governmental hospital	77	51.3
Private hospital	72	48.0
Both Gov. and Priv.	1	.7

## Years of experience

The years of experience is shown in table 18, almost 51.3% of the sample got less than 10 years of experience.

**Table 18: Distribution of the second group of nurses by Years of Experience**

Years of experience	Frequency	Valid Percent%
Less than 5 years	39	26.0
5-10 years	38	25.3
11-15 years	35	23.3
16-20 years	24	16.0
More than 20 years	14	9.3

### **Marital Status**

73.3% of the Nurses are married; table 19 below shows the marital status.

**Table 19: Distribution of the second group of nurses by Marital Status**

<b>Marital status</b>	<b>Frequency</b>	<b>Valid Percent%</b>
Single	33	22.0
Married	110	73.3
Divorced	3	2.0
Widow/er	4	2.7

### **Smoking**

26.4% of the nurses are smokers while the rest are not.

**Table 20: Distribution of the second group of nurses by Smoking**

<b>Smoking</b>	<b>Frequency</b>	<b>Valid Percent%</b>
Yes	39	26.4
No	109	73.6

### **Average sleeping hours**

The average sleeping hours is 6.9 hours (145 nurses answer this question out of 151).

## Break Interval

Table 21 below shows the break interval allowed during every shift, 55.5% got less than 15 minutes break, while 6.2% got more than 30 minutes.

**Table 21: Distribution of the second group of nurses by Break Intervals**

Break Interval	Frequency	Valid Percent%
Less than 15 minutes	81	55.5
16-30 minutes	56	38.4
More than 30 minutes	9	6.2

## Monthly Salary

55.7% of the nurses their monthly salaries between 2500- 3500 NIS, while 16.8% are more than 3000 NIS

**Table 22: Distribution of the second group of nurses by Monthly Salary**

Monthly Salary	Frequency	Valid Percent%
Less than 2500 NIS	41	27.5
2500-3500 NIS	83	55.7
More than 3500 NIS	25	16.8

## 4.2 Hypothesis Analysis

Before starting presenting the results of the hypotheses analysis, the method of calculating these results will be referred to be inferred through the presentation of results as showed below.

**Table 23: The method of calculating the mean of nurses answers**

Question	S. Disagree	Disagree	Neutral	Agree	S. Agree	Total
Question #1	20	15	30	55	40	160
Question #2	15	20	10	45	70	160
Question #3	10	20	20	65	45	160
Question #4	15	18	12	70	45	160
Question #5	5	10	8	85	52	160

As table showed the assumed sample size= 160

Numbers in the table are the total Answers individuals on each question, the following table clarify the meaning of shaded numbers.

**Table 24: Respondents average of answers meaning**

Total	What does total mean?
70	Means that there are 70 people of respondents answered the second question with Strongly Agree
12	Means that there are 12 people of respondents answered the fourth question with a neutral
20	Means that there are 20 people of respondents answered the first question to Strongly Disagree

Sample of calculation:

The following table came as a result of analyzing questions relating to H1.

Following will explain the method of calculation to get the values of mean in the table:

H1.Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	38.1883	5.33314	-5.17886	-10.31077	-7.42575	-10.04681	-7.68972
One Shift	29.3200	8.35562	-4.92624				

Example (2): Assuming we have 10 questions for first hypothesis:

Total represents the sum of each individual answers to all questions.

For example, 33 is the sum of the answers to the first individual in the sample on all the questions in this area.

Assuming that there are 500 people in the sample, answers to every person on the previous domain were collected and put the result in the column named Total, which became for each student a certain score does not exceed 50 (the highest coding answer is 5, and the number of questions 10 so,  $5 * 10 = 50$ ).

**Table 25: Calculating the average of answers for each hypothesis**

Sample	Answer of Q 1	Answer of Q2	....	....	....	Answer of Q9	Answer of Q10	Total
1								33
.								
.								
.								
500								

When you use the method in the previous table, taking the total of 410 nurses answers on questions about the first hypothesis, total was divided by 410 to get the mean.

If the question requires advanced analysis, for example analyzing one of the demographic variables such as ages, to calculate the mean of each age category, (for example, if individuals who are under the age of 25 is 30, taking the total of 30 nurses answers on questions about the first hypothesis, total was divided by 30 to get the mean of this category.

Research hypothesis were analyzed using SPSS software, after this step, the result of each hypothesis was compared with the result of studies mentioned in the second chapter to clarify the difference and the symmetry between these results and research results.

This part will state the results and the comparison with mentioned studies respectively.

The result of the major hypothesis will be discussed and compared with previous studies. Then a comparison between the two main groups will be clarified first group refer to nurses work in more than one shift and the second group refer to nurses conducting one shift without any rotation. Finally sub hypothesis will be discussed in general and based on a comparison between the demographic variables also.

Hypotheses presented in the thesis are those that resulted in a significant difference, hypotheses did not show significant differences were ignored when presenting the hypotheses and demographic variables analysis.

### **Hypothesis 1**

H1-Shift work nurses suffering from fatigue and sleep disturbances which may rise to be chronic insomnia.

Respondents accepted by 75.8% that Shift work nurses suffering from fatigue and sleep disturbances which may rise to be chronic insomnia, this is consistent with results of previous studies has been mentioned previously

in chapter three (Akerstedt T, 2009) and (Bambra, Whitehead, et al, (2008)).

After comparing results between the groups it was clear that problem of fatigue and sleep disturbances had the greatest impact on the first group due to the nature of their shifts, their response has a mean of 38.1883 with 95% confidence that is greater than the mean of second group having a mean of 29.3200.

**Table 26: Comparing results between the two groups regarding fatigue and sleep disturbances.**

H1.Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	38.1883	5.33314	-5.17886	-10.31077	-7.42575	-10.04681	-7.68972
One Shift	29.3200	8.35562	-4.92624				

### **Sub Hypothesis**

H1.1 Nurses who work in shifts do not take enough hours for sleeping and rest, and this problem may increase to suffering from insomnia, so they feel tired and sleepy all the time.

Respondents accepted by 82.2% of that nurse who work in shifts do not take enough hours for sleeping and rest so they feel tired and sleepy all the time, this result agreed with the study of (J. Pincombec, A. E. Rogersd, et al., 2011) that emphasized on necessity of taking naps to reduce the effect of being awake for long time. This result agreed with another study for (Akerstedt T, 2009) that resulted in nurses suffering from insomnia as a result of sleep disturbance.

Comparing between the groups showed that the first group is suffering more than the second one relating to sleeping hours and and rest so they feel sleepy all the time their response has a mean of 22.0976 with 95% confidence that is greater than the mean of second group with a mean of 17.8874.

**Table 27: Comparing between the two groups (H1.1)**

H1.1Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	22.0976	2.78403	0.13749	-5.17886	-3.24143	-4.92624	-3.49405
One Shift	17.8874	5.79027	0.47121				

To study hypothesis and linked to the demographic variables those variables were analyzed and the results were as follows:

**Age:**

It was clear from the results that the highest age group are suffering the most from the problem of lack of sleeping hours and rest so they feel sleepy all the time, this is the result of the accumulation of stress and suffering through their work during the long years of work, with aging these accumulations begin to appear and show signs of fatigue and insomnia.

**Table 28: H1.1 Statistical analysis by age.**

Age	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Less than 25	18.4300	2.97211	0.29721	17.8403	18.6197
25-35 years	19.9170	3.41400	0.22560	19.4725	21.3616
36-46 years	20.7273	4.71362	1.42121	19.8906	21.6927
More than 47	20.7917	3.83438	0.45189	20.2976	20.9791

**The presence of children**

The results showed that suffering of the problem of lack of sleeping hours and rest increases as the number of children so they feel sleepy all the time, with the presence of children and take care of their own burdens, take a break while at home it becomes difficult. This is reflected on the nurses during their work as always feel they do not take enough sleep and rest.

**Table 29: H1.1 Statistical analysis by presence of children.**

The presence of children	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
None	20.1226	3.30939	0.25532	19.9185	20.9267
Less than 3	21.2444	3.24949	0.27967	20.6913	21.7976
3-6	21.3652	3.98846	0.41583	19.2392	21.8912
More than 7	22.1667	4.83986	1.39715	17.0916	23.2418
Total	21.6069	3.52301	0.17463	20.2636	21.9502

**Smoking:**

Smokers suffer more than Non-Smokers regarding sleeping hours, this result may be referred to caffeine consumption accompanying with smoking.

**Table 30: H1.1 Statistical analysis by Smoking.**

Are you a smoker	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
Yes	20.8994	3.29290	0.19043	-1.59483	-0.02908	-1.67568	-0.05178
No	20.0873	3.99114	0.39304				

**Break Interval:**

Whenever the break interval decrease the problem of sleeping hours and taking rest increased, this happen because nurses can not take rest or a short nap during their work due to work pressure so they feel sleepy.

**Table 31: H1.1 Statistical analysis by Break Interval.**

Break Interval	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Less than 15 minutes	21.1149	3.23304	.21090	20.6994	21.5304
16-30 minutes	20.1189	3.57710	0.29913	19.5276	20.7102
More than 30 minutes	18.9048	5.04881	1.10174	16.6066	21.2030
Total	20.6416	3.51870	0.17616	20.2953	20.9879

H1.2 Nurse who work in shifts do not have special place in the hospital for to take a break and do not have entertainment (TV, PC, Internet, beverages,...)

Results below showed inability of nurses to take a break and the lack of places dedicated to the comfort and the failure of the hospital to provide the means for their entertainment, this will increase work pressure so they performance will affected negatively.

**Table 32: H1.2 Statistical analysis**

Nurses can take break or short nap	Frequency	Valid Percent
Disagree	265	64.6
Neutral	61	14.9
Agree	84	20.5
Total	410	100.0

**Table 33: H1.2 Statistical analysis**

Hospital provides entertainment (TV, PC, Internet, beverages,...)	Frequency	Valid Percent
Disagree	349	85.1
Neutral	16	3.9
Agree	45	11.0
Total	410	100.0

**Table 34: H1.2 Statistical analysis**

There is a special place in the hospital for the nurses to take a break	Frequency	Valid Percent
Disagree	305	74.4
Neutral	29	7.1
Agree	76	18.5
Total	410	100.0

After comparing results between the groups it was clear that problem of taking rest and provision of entertainment means had the greatest impact on the first group due to the nature of their shifts, their response has a mean of 7.7512 with 95% confidence that is greater than the mean of second group with a mean of 5.8477.

**Table 35: Comparing between the two groups (H1.2)**

H 1.2 Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	7.7512	4.57179	0.22578	-2.56500	-2.76500	-2.69271	-2.89271
One Shift	5.8477	3.06539	0.24946				

### H1.3 Nurse who work in shifts take stimulant beverages and drugs to stay awake

Nurses agreed that they have to take stimulant drinks and sometimes they may have to take stimulant medications, but lower rates of stimulant drinks to stay awake, this result came up with same results of a study for (Jay, Petrilli, et al., 2006) that warned of the impact of long-term use of these drinks and drugs what may cause addiction and other negative health effects.

**Tables 36: H1.3 Statistical analysis**

I have to take drink stimulant beverages to stay awake on the job (coffee, energy drinks, ...)	Frequency	Valid Percent
Disagree	98	17.5
Neutral	54	9.6
Agree	409	72.9
Total	561	100.0

**Tables 37: H1.3 Statistical analysis**

I have to take stimulant drugs to stay awake on the job	Frequency	Valid Percent
Disagree	391	69.7
Neutral	71	12.7
Agree	99	17.6
Total	561	100.0

More analysis was conducting to link hypothesis to demographic variables as follows:

**Smoking:**

Non-smokers take stimulant beverages and drugs to stay awake more than smokers, this may have a close explanation to a previous hypothesis that linked this phenomenon to caffeine consumption which increase with smoking, so non-smokers can stay awake more than smokers with loss consumption of stimulant beverages and drugs.

**Table 38: H1.3 Statistical analysis by Smoking**

Are you a smoker	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
Yes	4.0068	1.09167	0.06378	+0.17408	+0.31281	+0.17374	+0.31246
No	5.0762	1.08038	0.10543				

**Gender:**

Results showed that female nurses take stimulant beverages and drugs to stay awake more than male nurses, this hypothesis could be explained after linking smoking and caffeine consumption rate to it, because male smokers formed the highest percent of smokers.

**Table 39: H1.3 Statistical analysis by Gender**

Gender	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
Male	3.9638	1.10723	0.07448	-0.35463	-0.07571	-0.35423	-0.07531
Female	4.1033	1.08401	0.07991				

#### H1.4 Fatigue and drowsiness are only associated with night shifts

Results below showed that fatigue and drowsiness are not associated with night shifts and accompanying them in all shifts.

**Table 40: H1.4 Statistical analysis**

Fatigue and drowsiness are only associated with night shifts	Frequency	Valid Percent
Disagree	265	64.6
Neutral	62	15.1
Agree	83	20.2
Total	410	100.0

#### Hypothesis 2

H2- Diverse health problems may appear as a result of shift work.

Around 79.4% from nurses filled the questionnaire accepted that diverse health problems may appear as a result of shift work and this result agreed with previous studies in this domain such as ( Barnes J. L., Davies K. S., et al., 2010).

Results showed that the first group was affected more than the second group regard up having health problems due to their work system, their response has a mean of 20.5073 with 95% confidence that is greater than the mean of second group with a mean of 18.6556.

**Table 41: Comparing results between the two groups regarding health problems**

H2.Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	20.5073	4.41449	0.21802	-2.58222	-1.12116	-2.64318	-1.06020
One Shift	18.6556	3.69332	0.30056				

**Sub Hypothesis**

H2.1 Nurses working in shifts system suffering from decrease or increase in weight as a result of the different system of their lives and their diet, nurses can not adopt healthy diet because they take their meals at hospital without any choices, also they do not have regular free time to playing sports and exercising.

Results showed that respondents accepted this hypothesis but not in a high percentage of acceptance, specially the weight loss one.

**Table 42: H2.1 Statistical analysis**

I gained weight due to shift work system	Frequency	Valid Percent
Disagree	160	39.0
Neutral	66	16.1
Agree	184	44.9
Total	410	100.0

**Table 43: H2.1 Statistical analysis**

I lost weight due to shift work system	Frequency	Valid Percent
Disagree	161	39.3
Neutral	86	21.0
Agree	163	39.8
Total	410	100.0

Weights of the first group is affected more than second group whom working in one shift, this may resulted from work stress, so they relieve this stress by consumption of a larger amount of food.

**Table 44: Comparing between the two groups (H2.1)**

H2.1Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	4.2829	1.11796	0.05521	-0.35412	-0.05317	-0.35739	-0.05643
One Shift	4.0132	1.07502	0.08748				

Only one demographic variable showed significant difference when analyzed which was gender, it was clear that females affected more than males.

**Table 45: H2.1 Statistical analysis by Gender**

Gender	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
Female	4.0588	0.95878	0.06449	-0.65988	-0.23334	-0.66472	-0.22850
Male	3.5054	1.22362	0.09021				

H2.2 Smoking levels between nurses may increase as a result of shift work.

Result showed that smoking rate of smokers increased due to their work system, this may be a result of work stress so nurses find smoking as way to get rid of this stress, but results showed that non-smokers did not become smokers.

**Table 46: H2.2 Statistical analysis**

Cigarettes I smoke increased due to shift work system	Frequency	Valid Percent
Disagree	112	27.3
Neutral	58	14.1
Agree	240	58.5
Total	410	100.0

**Table 47: H2.2 Statistical analysis**

I became a smoker as a result of my work	Frequency	Valid Percent
Disagree	254	62.0
Neutral	63	15.4
Agree	93	22.7
Total	410	100.0

The proportion of smokers from the first group is greater than the percentage of the second group; their response has a mean of 3.7951 with 95% confidence that is greater than the mean of second group with a mean of 3.1636.

**Table 48: Comparing between the two groups (H2.2)**

H2.2Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	3.7951	1.62445	0.08023	+0.13308	+0.46999	+0.13422	+0.47113
One Shift	3.1636	1.60323	0.13047				

With the aging some smokers lift off from this habit because of illnesses and health problems led to quit smoking, It is noted that the problem of smoking increased among younger age groups as follows:

**Table 49: H2.2 Statistical analysis by Smoking**

Age	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Less than 25	3.2000	1.57138	0.15335	2.8959	3.5041
25-35 years	3.4350	1.67494	0.11216	3.2139	3.6560
36-46 years	2.9282	1.48297	0.17600	2.6772	3.3792
More than 47	2.8000	1.93218	0.61101	1.8178	4.5822
Total	3.2983	1.62518	0.08036	3.1403	3.4563

H2.3 Nurses became Susceptible to chronic diseases, frequent health setbacks and intestinal disorders due to shift work.

The results showed that nurses are more likely than others to health problems and increase their exposure to health setbacks and intestinal disorders as a result of the nature of their work, this result agreed with the study result of (Boggild. H, 2000)

that emphasized on this issue, the study mentioned for the increase of heart attacks, diabetes, beside the increase of cancers, also nurses immunology decrease, so they be exposed more than others for health setbacks as esoteric diseases, cold and flu.

**Tables 49: H2.3 Statistical analysis**

I suffer chronic diseases because of my work (pressure, diabetes, ...)	Frequency	Valid Percent
Disagree	333	59.4
Neutral	101	18.0
Agree	127	22.6
Total	561	100.0

**Tables 50: H2.3 Statistical analysis**

I have frequent health setbacks due to my work	Frequency	Valid Percent
Disagree	192	34.2
Neutral	102	18.2
Agree	267	47.6
Total	561	100.0

**Tables 51: H2.3 Statistical analysis**

I suffer intestinal disorders as a result of shift work system (colic, loss of appetite, ...)	Frequency	Valid Percent
Disagree	119	21.2
Neutral	86	15.3
Agree	356	63.5
Total	561	100.0

After comparing results between the groups it was clear that problem of smoking had the greatest impact on the first group due to the nature of their shifts, their response has a mean of 7.7512 with 95% confidence that is greater than the mean of second group with a mean of 5.8477.

**Table 52: Comparing between the two groups (H2.3)**

H2.3Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	6.7537	1.85628	0.09168	+0.22460	+0.48682	+0.21883	+0.48105
One Shift	6.0848	1.91269	0.15565				

Below it was clear that the older age group are more likely to suffer from this problem.

**Table 53: H2.3 Statistical analysis by Age**

Age	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Less than 25	5.9810	1.85525	0.18105	5.6219	6.3400
25-35 years	6.2063	1.76619	0.11827	5.9732	6.4394
36-46 years	6.5958	2.10709	0.25007	5.7970	6.7945
More than 47	6.7000	2.11082	0.66750	4.1900	7.2100
Total	6.1516	1.85808	0.09188	5.9710	6.3322

**Hypothesis 3**

H3- Shift work nurses suffering from diverse social and psychological problems due to the nature of their working times.

Respondents accepted by 77.3% that Shift work nurses suffering from diverse social and psychological problems due to the nature of their working times, this is consistent with results of previous studies has been mentioned previously in chapter three (Goswami R, 2012).

A comparison between the two groups was conducted and the results showed that the first group suffer more than the second group, their response has a mean of 66.6659 with 95% confidence that is greater than the mean of second group with a mean of 42.7682.

**Table 54: Comparing results between the two groups regarding social and psychological problems**

H.3 Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2=(\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	66.6659	11.82484	0.58399	-26.88709	-20.90819	-26.41761	-21.37768
One Shift	42.7682	17.19436	1.39926				

**Sub Hypothesis**

H3.1 Nurses work in shifts suffering from psychological problems due to work pressure

Nurses agreed by 70.6% that nurses work in shifts suffering from psychological problems due to work pressure, these problems resulted from situations of death of their patients, their sense of isolation, instability of their shifts and daily problems in dealing with patients needs and their relatives, This result agreed with the study of (Domrose, 2011).

Comparing between the groups showed that the first group is suffering more than the second one relating to psychological problems their response has a mean of 28.2732 with 95% confidence that is greater than the mean of second group with a mean of 24.6490.

**Table 55: Comparing between the two groups (H3.1)**

H3.1 Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	28.2732	5.30521	0.26201	-4.64988	-2.59845	-4.62767	-2.62065
One Shift	24.6490	5.53197	0.45019				

To study hypothesis and linked to the demographic variables those variables were analyzed and the results were as follows:

### Salary Scale:

It was clear from the results that the highest group accepted that they are suffering the most from psychological problems is the group of the lowest salaries, this result may be explained that lower standard of living because of the low-income will result in suffering from psychological problems.

**Table 56: H3.1 Statistical analysis by Salary Scale**

Salary Scale	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Less than 2500 NIS	28.6423	5.31643	0.47937	27.6933	29.5912
2500-3500 NIS	28.1579	5.32781	0.33900	27.4902	28.8256
More than 3500 NIS	27.7568	5.14461	0.84577	26.0415	29.4721
Total	28.2678	5.30215	0.26282	27.7512	28.7845

### Break Interval:

It was clear from the results that the highest group accepted that they are suffering the most from psychological problems is the group of the lowest break interval, because they do not have any time to get rid of work pressure or to entertaining themselves.

**Table 57: H3.1 Statistical analysis by Break Interval**

Break Interval	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Less than 15 minutes	28.5738	5.21079	0.33848	27.9070	29.2407
16-30 minutes	27.8456	5.30112	0.45457	26.9466	28.7446
More than 30 minutes	27.5238	5.67996	1.23947	25.9383	31.1093
Total	27.8198	5.26492	0.26524	27.7983	28.8413

**Workplace:**

Nurses work in governmental hospitals suffer from psychological problems more than those working in private hospitals, this may be a result of work pressure and difficult working conditions in these hospitals in addition to salaries cutout and strikes are made for this purpose, as following results state:

**Table 58: H3.1 Statistical analysis by Workplace**

Workplace	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
Governmental hospital	28.6606	5.31881	0.36024	0.25832	1.84609	0.25825	1.84601
Private hospital	27.8667	5.30879	0.39569				

### H3.2 Nurses work in shifts suffering from social problems due to work pressure

Nurses agreed by 68.4% that nurses work in shifts suffering from social problems due to work pressure, this result agreed with results of a study for (Goswami R, 2012) that emphasized on the difficulty of spending time with family, practicing any hobbies and activities and maintaining social relations.

Comparing between the groups showed that the first group is suffering more than the second one relating to social problems their response has a mean of 15.3708 with 95% confidence that is greater than the mean of second group with a mean of 15.0490.

**Table 59: Comparing between the two groups (H3.2)**

H3.2Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	15.3708	2.64344	0.13368	-0.90104	-0.25725	-0.85588	-0.21209
One Shift	15.0490	3.12943	0.26170				

The following are the variables that showed differences among themselves during the analysis of this hypothesis

**Gender:**

Results showed that shift work causes more social problems for female nurses, this is due to the nature of Palestinian society and severity in the launch of harsh judgments on females, where society accepts the idea of working in the nursing profession and its subsequent like having night shifts for males more than females.

**Table 60: H3.2 Statistical analysis by Gender**

Gender	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2=(\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2\neq(\sigma_2)^2$	
				Lower	Upper	Lower	Upper
Female	13.4930	2.77425	0.16404	0.28757	0.68488	0.28964	0.68694
Male	13.0047	2.94037	0.18671				

**Marital Status:**

Married, divorced, widow/r are suffering from social problems resulted from shift work more than singles.

**Table 61: H3.2 Statistical analysis by Martial Status**

Marital Status	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Single	15.0403	2.74795	0.24677	14.1519	14.5288
Married	15.5000	2.56475	0.15785	14.5519	15.5288
Divorced	20.0000	2.76475	0.18755	15.0892	15.9108
Widow/er	20.0000	2.36475	0.15785	15.1892	15.8908
Total	15.3769	2.64410	0.13389	15.1137	15.6402

**The Presence of children:**

The results showed that suffering of social problems increases as the number of children, as an increase in the presence of children may cause the creation of family problems as a result of the inability to care of them and distract attention from the rest of the social things.

**Table 62: H3.2 Statistical analysis by Presence of Children**

The presence of children	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
None	14.1273	2.66450	0.20743	14.7177	15.5369
Less than 3	15.7480	2.53536	0.22498	15.3028	16.1933
3-6	15.3412	2.74102	0.29730	14.7500	15.9324
More than 7	15.8750	3.09089	1.09279	12.2910	17.4590
Total	15.3740	2.65270	0.13519	15.1082	15.6398

H3.3 Nurses offer medical help for neighbors and relatives outside hospital and for hospital patients after their shifts

Nurses expressed their willingness to provide medical services and to help their relatives and neighbors outside the hospital and outside working hours

**Tables 63: H3.3 Statistical analysis**

I offer medical help for neighbors and relatives outside hours	Frequency	Valid Percent
Disagree	46	8.2
Neutral	50	8.9
Agree	465	82.9
Total	561	100.0

But they are not willing to stay in the hospital and provide services for patients after their shifts, they are leaving hospital quickly after finishing their shifts.

**Tables 64: H3.3 Statistical analysis**

I am ready to offer help for hospital patients after shifts	Frequency	Valid Percent
Disagree	344	61.3
Neutral	107	19.1
Agree	110	19.6
Total	561	100.0

Results did not show any differences relating to this hypothesis when analyzed between the first and second group, also no differences regard the demographic variables.

### **3.4 The only problem about work is shift work system**

More than half responded that the problem in their work lies in the nature of their work in shifts, this result agreed with (Fields R, 2012) that sorted issues damage employee satisfaction in hospitals, the study considered shift work problem as the most prominent issue in this regard.

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**Table 65: H3.4 Statistical analysis**

The only problem about my work is shift work system	Frequency	Valid Percent
Disagree	123	21.9
Neutral	114	20.3
Agree	324	57.8
Total	561	100.0

The following are the variables that showed a difference between them when analyzing this hypothesis:

**Gender:**

Results showed that female nurses consider shift work is the major problem of their work more than male nurses, and this result could be linked to social pressure that female nurses exposed for more than male nurses.

**Table 66: H3.4 Statistical analysis by Gender**

The only problem about my work is shift work system		Gender		Total
		Female	Male	
Disagree	Count	39	47	86
	% within The only problem about my work is shift work system	45.3%	54.7%	100.0%
Neutral	Count	40	41	81
	% within The only problem about my work is shift work system	49.4%	50.6%	100.0%
Agree	Count	142	96	238
	% within The only problem about my work is shift work system	59.7%	40.3%	100.0%
Total	Count	221	184	405
	% within The only problem about my work is shift work system	54.6%	45.4%	100.0%

**Marital Status:**

Married form the largest percentage of those who considered that their problem lies in their work in shifts, this result came from being obligated to family duties and burdens that conflict with shifts, this result is clear in table 67 (Appendix C).

### **The presence of children:**

Nurses that have children form the largest percentage of those who considered that their problem lies in their work in shifts, so they face daily problems in coordination between these rotating shifts and their family duties, table 68 (Appendix C) shows this result.

### **H3.5: Nurses prefer to move to another profession where there is not shift work system**

Large proportion of respondents expressed their desire to move to another job where there is no shifts system.

**Table 69: H3.5 Statistical analysis**

I prefer to move to another profession where there is not shift work system	Frequency	Valid Percent
Disagree	43	10.5
Neutral	67	16.3
Agree	300	73.2
Total	410	100.0

The following are the variables that showed a difference between them when analyzing this hypothesis:

**Gender:**

Female nurses expressed their desire to move to another job where there are no shifts more than male nurses, female nurses are exposed to social pressure because of being shift workers more than male nurses so this lead them to look for work vacancies free of shifts.

**Table 70: H3.5 Statistical analysis by Gender**

I prefer to move to another profession where there is not shift work system		Gender		Total
		Female	Male	
Disagree	Count	18	24	42
	% within I prefer to move to another profession where there is not shift work system	42.9%	57.1%	100.0%
Neutral	Count	26	41	67
	% within I prefer to move to another profession where there is not shift work system	38.8%	61.2%	100.0%
Agree	Count	177	119	296
	% within I prefer to move to another profession where there is not shift work system	59.8%	40.2%	100.0%
Total	Count	221	184	405
	% within I prefer to move to another profession where there is not shift work system	54.6%	45.4%	100.0%

**Marital Status:**

All of marital status (married, divorced, widow/er) have the desire to move to another job more than singles because these statuses have burdens and duties more than singles.

**Table 71: H3.5 Statistical analysis by Marital status**

Marital status		I prefer to move to another profession where there is not shift work system			Total
		Disagree	Neutral	Agree	
Single	Count	101	5	21	127
	% within Marital status	79.5%	3.9%	16.5%	100.0%
Married	Count	42	24	206	272
	% within Marital status	15.4%	8.8%	75.7%	100.0%
Divorced	Count	0	0	2	2
	% within Marital status	.0%	.0%	100.0%	100.0%
Widow/er	Count	0	0	1	1
	% within Marital status	.0%	.0%	100.0%	100.0%
Total	Count	143	29	230	402
	% within Marital status	35.6%	7.2%	57.2%	100.0%

**The presence of children:**

Respondents who have children have the desire to move to another job without shifts more than who do not have children in order to have the opportunity for taking care of their children and to spend longer time with them.

**Table 72: H3.5 Statistical analysis by Presence of Children**

No of children		I prefer to move to another profession where there is not shift work system			Total
		Disagree	Neutral	Agree	
None	Count	135	6	28	169
	% within No of children that you	79.9%	3.6%	16.6%	100.0%
Less than 3	Count	19	16	91	126
	% within No of children that you	15.1%	12.7%	72.2%	100.0%
3-6	Count	9	3	86	98
	% within No of children that you	9.2%	3.1%	87.8%	100.0%
More than 7	Count	2	0	8	10
	% within No of children that you	20.0%	.0%	80.0%	100.0%
Total	Count	165	25	213	403
	% within No of children that you	40.9%	6.2%	52.9%	100.0%

**Hypothesis 4**

H4- There are certain criteria that should be taken into account upon choosing shift work nurses.

Respondents confirmed by 76.6% that there are no certain criteria that taken into account upon choosing shift work nurses, this is inconsistent with the findings of previous studies that recommended the need to take into account many factors in the process of distribution shifts to nurses such as (Akerstedt T, 2009).

### Sub Hypothesis

H4.1 Distribution of shifts takes into account age and health condition of patients

The largest percentage of respondents answered that supervisors do not take into account the situation of nurses health and their age when the distributing shifts.

**Table 73: H4.1 Statistical analysis**

Distribution of shifts takes into account age and health condition of nurses	Frequency	Valid Percent
Disagree	209	52.6
Neutral	52	13.1
Agree	136	34.3
Total	397	100.0

H4.2 Male and female nurses are distinguished when distributing shifts.

Results showed that gender is considered when shifts distributed, this may be referred for distributing nurses on hospital wards which are classified by gender of patients.

**Table 74: H4.2 Statistical analysis**

Gender is considered when shifts distributed	Frequency	Valid Percent
Disagree	124	31.6
Neutral	95	24.2
Agree	174	44.3
Total	393	100.0

**H4.3** Distribution of shifts takes into account years of nurses' experience.

Result showed that years of experience and presence of supervisor are considered when distributing shifts.

**Table 75: H4.3 Statistical analysis**

Distribution of shifts takes into account years of nurses' experience	Frequency	Valid Percent
Disagree	156	38.0
Neutral	59	14.4
Agree	195	47.6
Total	410	100.0

The group most in favor of this hypothesis is nurses with higher years of experience than others as result shows in table 76 (Appendix C).

**H4.4** Social conditions and existence of children are taken into account when distributing shifts.

The results showed disregard for nurses social conditions and the presence of children they have in the distribution of shifts among them, and this is increasing their suffering from both social and psychological problems.

**Table 77: H4.4 Statistical analysis**

Social conditions and existence of children are taken into account when distributing shifts	Frequency	Valid Percent
Disagree	223	54.4
Neutral	72	17.6
Agree	115	28.0
Total	410	100.0

More analyze was conducting to link the hypothesis to demographic variables as follows:

**Gender:**

Female nurses opposed this hypothesis more than male nurses and the results were as follows:

**Table 78: H4.4 Statistical analysis by Gender**

Social conditions and existence of children are taken into account when distributing shifts		Gender		Total
		Female	Male	
Disagree	Count	142	77	219
	% within Social conditions and existence of children are taken into account when distributing shifts	64.8%	35.2%	100.0%
Neutral	Count	32	39	71
	% within Social conditions and existence of children are taken into account when distributing shifts	45.1%	54.9%	100.0%
Agree	Count	47	68	115
	% within Social conditions and existence of children are taken into account when distributing shifts	40.9%	59.1%	100.0%
Total	Count	221	184	405
	% within Social conditions and existence of children are taken into account when distributing shifts	54.6%	45.4%	100.0%

**Marital Status:**

The group most opposed to this hypothesis is the married class as showed in table 79 (Appendix C).

**The presence of children:**

Nurses who have children disagreed with this hypothesis more than whom do not have children, this result is clear in table 80 (Appendix C).

**H4.5** Distribution of shifts takes into account residence of nurses and transportation issues.

Respondents answered that their transportation issues and residence are not taken into account when distributing shifts.

**Table 81: H4.5 Statistical analysis**

Distribution of shifts takes into account residence of nurses and transportation	Frequency	Valid Percent
Disagree	197	48.0
Neutral	58	14.1
Agree	155	37.8
Total	410	100.0

The following demographic variables showed differences among themselves when analyzed.

**Gender:**

Female nurses complained that their residence and transportation issues are not taken into account when distributing shifts more than male nurses.

**Table 82: H4.5 Statistical analysis by Gender**

Distribution of shifts takes into account residence of nurses and transportation issues		Gender		Total
		Female	Male	
Disagree	Count	127	66	193
	% within Distribution of shifts takes into account residence of nurses of transportation issues	65.8%	34.2%	100.0%
Neutral	Count	23	35	58
	% within Distribution of shifts takes into account residence of nurses of transportation issues	39.7%	60.3%	100.0%
Agree	Count	71	83	154
	% within Distribution of shifts takes into account residence of nurses of transportation issues	46.1%	53.9%	100.0%
Total	Count	221	184	405
	% within Distribution of shifts takes into account residence of nurses of transportation issues	54.6%	45.4%	100.0%

**Marital Status:**

The group most opposed to this hypothesis is the married class as showed in table 83 (Appendix C).

**The presence of children:**

The group most opposed to this hypothesis is the class of nurses who have children as showed in table 84 (Appendix C).

**Hypothesis 5**

H5- Errors and accidents may occur as a result of shift work fatigue and stress.

Nurses agreed by 62.4% that errors and accidents may occur as a result of shift work fatigue and stress this result agrees with previous studies conducted all over the world such as (Akerstedt T, 2009) that related between errors and accidents and the amount of sleep obtained last 24 hours, the study resulted in increasing of exposure to accidents and having medical errors as the amount of sleep last 24 hours decrease.

After comparing results between the groups it was clear that problem of errors and accidents appears clearer relating to the first group due to the nature of their shifts, their response has a mean of 11.5575 with 95% confidence that is greater than the mean of second group with a mean of 8.6259.

**Table 85: Comparing results between the two groups regarding accidents and errors occurring**

H5.Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2=(\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2\neq(\sigma_2)^2$	
				Lower	Upper	Lower	Upper
More than one shift	11.5575	2.76218	0.13658	-3.60002	-2.26319	-3.50917	-2.35405
One Shift	8.6259	3.76212	0.31029				

**Sub Hypothesis**

H5.1 Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration

Nurses said in their questionnaires that they could be injured or face accidents due to fatigue and shift work stress, this result agreed with (Bambra, Whitehead, et al, (2008)) that resulted in increasing of exposure to accidents and personal injuries, the study referred this result to fatigue and stress nurses exposed for, also the study mentioned to the relation between shifts rotation and accidents and considered shifts rotation as one of main reasons for accidents.

**Table 86: H5.1 Statistical analysis**

Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration	Frequency	Valid Percent
Disagree	76	18.5
Neutral	65	15.9
Agree	269	65.6
Total	410	100.0

The first group of nurses work more than one shift agreed with this hypothesis more than the second group.

**Table 87: Comparing between the two groups (H5.1)**

One shift or more than one shift	Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration			Total
	Disagree	Neutral	Agree	
More than one shift	Count 42 10.3%	Count 49 12.0%	Count 318 77.8%	Count 409 100.0%
One shift	Count 97 64.7%	Count 14 9.3%	Count 39 26.0%	Count 150 100.0%
Total	Count 139 24.9%	Count 63 11.3%	Count 357 63.9%	Count 559 100.0%

Nurses who take short break intervals are more likely to have personal injuries and accidents.

H5.2 Percentage of medical errors increases as a result of shift work system.

Most of nurses agreed with this hypothesis and they find that medical errors may happen as a result of shift work stress and fatigue, this result agreed with the result of the a study for (Rogers, Hwang A.E. , et al., 2010) that mentioned to increase of nurses medical errors because they feel sleepy and lose their ability to focus as poorly as they have a high level of alcohol in their blood.

**Table 89: H5.2 Statistical analysis**

Percentage of medical errors increases as a result of shift work system	Frequency	Valid Percent
Disagree	138	33.7
Neutral	91	22.2
Agree	181	44.1
Total	410	100.0

Nurses work in more than one shift formed the highest percent of those who agreed with this hypothesis.

**Table 90: Comparing between the two groups (H5.2)**

Percentage of medical errors increases as a result of shift work system		One shift or more than one shift		Total
		One shift	More than One shift	
Disagree	Count	76	83	159
	% within Percentage of medical errors increases as a result of shift work system	47.8%	52.2%	100.0%
Neutral	Count	32	74	106
	% within Percentage of medical errors increases as a result of shift work system	30.2%	69.8%	100.0%
Agree	Count	43	253	296
	% within Percentage of medical errors increases as a result of shift work system	14.5%	85.5%	100.0%
Total	Count	151	410	561
	% within Percentage of medical errors increases as a result of shift work system	26.9%	73.1%	100.0%

The most daring group was nurses have the longest period of experience they approved that medical errors could increase as a result of shift work, some nurses especially the new ones are afraid to admit occurrence of medical errors and accidents while performing their work even if these errors are diagnosed as a result of fatigue.

**Table 91: H5.2 Statistical analysis by Years of Experience**

Years of experience		Percentage of medical errors increases as a result of shift work system			Total
		Disagree	Neutral	Agree	
Less than 5 years	Count % within Years of experience	133 70.0%	54 28.4%	3 1.6%	190 100.0%
5-10 years	Count % within Years of experience	17 33.3%	29 56.9%	5 9.8%	51 100.0%
11-15 years	Count % within Years of experience	8 6.8%	12 10.2%	98 83.1%	118 100.0%
16-20 years	Count % within Years of experience	3 10.3%	10 34.5%	16 55.2%	29 100.0%
More than 25 years	Count % within Years of experience	1 16.7%	1 16.7%	4 66.7%	6 100.0%
Total	Count % within Years of experience	162 41.1%	106 26.9%	126 32.0%	394 100.0%

**H5.3 Percentage of medical errors increases during night shifts**

More than half of respondents supported this hypothesis that night shift could have medical errors more than other shifts, this result agreed with (Flo. E, 2013) study that resulted in increasing of medical errors and exposure to accidents during night shift due to fatigue and some times limited number of nurses at this shift.

**Table 92: H5.3 Statistical analysis**

Percentage of medical errors increases during night shifts	Frequency	Valid Percent
Disagree	176	42.9
Neutral	27	6.6
Agree	207	50.5
Total	410	100.0

As following table shows the first group of nurses agreed with this hypothesis more than the second group.

**Table 93: Comparing between the two groups (H5.3)**

One shift or more than one shift		Percentage of medical errors increases during night shifts			Total
		Disagree	Neutral	Agree	
More than one shift	Count	27	18	363	408
	% within one shift or more than one shift	6.6%	4.4%	89.0%	100.0%
One shift	Count	105	27	16	148
	% within one shift or more than one shift	70.9%	18.2%	10.8%	100.0%
Total	Count	132	45	379	556
	% within one shift or more than one shift	23.7%	8.1%	68.2%	100.0%

Following are the tow demographic variables that showed difference when analyzed relating to this hypothesis.

### Years of experience:

Most of nurses agreed with the hypothesis were from the group of the highest years of experience.

**Table 94: H5.3 Statistical analysis by Years of Experience**

Years of experience		Percentage of medical errors increases during night shifts			Total
		Disagree	Neutral	Agree	
Less than 5 Years	Count	18	1	159	178
	% within Years of experience	10.1%	.6%	89.3%	100.0%
5-10 years	Count	3	2	41	46
	% within Years of experience	6.5%	4.3%	89.1%	100.0%
11-15 years	Count	6	13	130	149
	% within Years of experience	4.0%	8.7%	87.2%	100.0%
16-20 years	Count	0	2	27	29
	% within Years of experience	.0%	6.9%	93.1%	100.0%
More than 25 years	Count	0	0	6	6
	% within Years of experience	.0%	.0%	100.0%	100.0%
Total	Count	27	18	363	408
	% within Years of experience	6.6%	4.4%	89.0%	100.0%

### Gender:

After analyzing gender results showed that male nurses agreed with this hypothesis more than female nurses, where they are bolder than females for the recognition of the occurrence of errors.

**Table 95: H5.3 Statistical analysis by Gender**

Gender		Percentage of medical errors increases during night shifts			Total
		Disagree	Neutral	Agree	
Female	Count	22	10	71	103
	% within Gender	21.4%	9.7%	68.9%	100.0%
Male	Count	5	8	292	305
	% within Gender	1.6%	2.6%	95.7%	100.0%
Total	Count	27	18	363	408
	% within Gender	6.6%	4.4%	89.0%	100.0%

**H5.4** When a medical error occurred because of fatigue, I am held responsible by hospital administration and patient family.

This hypothesis consists of two parts and deals with blaming nurses when medical errors occur due to tired and fatigue caused by working in shifts of both the hospital administration or by the patients' families, and results showed that they blame nurses in these cases and do not appreciate diagnosed tired, as the pressure of work does not relieve them of responsibility.

**Tables 96: H5.4 Statistical analysis**

When a medical error occurred because of fatigue, I am held responsible by hospital administration	Frequency	Valid Percent
Disagree	35	8.5
Neutral	66	16.1
Agree	309	75.4
Total	410	100.0

**Tables 97: H5.4 Statistical analysis**

When a medical error occurred because of fatigue, I am held responsible by patient's parents	Frequency	Valid Percent
Disagree	73	17.8
Neutral	98	23.9
Agree	239	58.3
Total	410	100.0

**Hypothesis 6**

H6- Level of stress shift work nurses are exposed to differs among hospital departments and time of shifts and other factors.

Nurses agreed that 70.3% of level of stress shift work nurses are exposed to differs among hospital departments and time of shifts and other factors this result agreed with previous studies such as (Arthur L. Frank, et al., 2000).

A comparison between the two groups was conducted and the results showed that the first group agreed with this hypothesis more than the second group, their response has a mean of 66.2317 with 95% confidence that is greater than the mean of second group with a mean of 55.1849.

**Table 98: Comparing results between the two groups regarding Level of stress they exposed to**

H6.Total	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
				More than one shift	66.2317	8.72466	0.43088
One Shift	55.1849	8.06525	0.66749				

### Sub Hypothesis

H6.1 Nurses feel comfortable when there is specific time for patient visits

When this hypothesis been analyzed result showed satisfaction with nurses when there are specific times to visit as a previous study for (Scott W.T., Aiken L.D., 2007) agreed, patients families and visitors cause disturbance in hospital wards and discomfort for the rest of the patients in addition to prevent nurses from doing their work.

**Table 99: H6.1 Statistical analysis**

I feel comfortable there is specific time for patient visits	Frequency	Valid Percent
Disagree	50	12.2
Neutral	23	5.6
Agree	337	82.2
Total	410	100.0

When analyzing this hypothesis showed clear differences between the two groups, the first group agreed with it more than second group.

**Table 100: Comparing between the two groups (H6.1)**

One shift or more than one shift		I feel comfortable there is specific time for patient visits			Total
		Disagree	Neutral	Agree	
More than one shift	Count	23	15	366	404
	% within one shift or more than one shift	5.7%	3.7%	90.6%	100.0%
One shift	Count	104	4	40	148
	% within one shift or more than one shift	70.3%	2.7%	27.0%	100.0%
Total	Count	127	19	406	552
	% within one shift or more than one shift	23.0%	3.4%	73.6%	100.0%

### H6.2 Work load and psychological pressure differ by ward

Nurses agreed that hospital ward differ among themselves in terms of work load and psychological pressure, this result agreed with the study of (Scott W.T., Aiken L.D., 2007) that mentioned for preference of nurses to work in some wards more than others due to differences in pressure at work among them and due to the difficulty of some cases, particularly in some wards, in addition to the nature of the diseases that need follow-up care more than others.

**Table 101: H6.2 Statistical analysis**

Work load and psychological pressure differ by ward	Frequency	Valid Percent
Disagree	13	3.2
Neutral	29	7.1
Agree	368	89.8
Total	410	100.0

### H6.3 Work load and psychological pressure differ by shift

Nurses agreed with this hypothesis, part of them said that work pressure at morning and afternoon is more than pressure at night shift due to annoying from visitors, also patients are awake during these shifts, other opinion came up with a result that work pressure at night shift since there are no specialist doctors, and some times less number of nurses at these shifts, these results were agreed with the study of (Scott W.T., Aiken L.D., 2007).

as the following result shows:

**Table 102: H6.3 Statistical analysis**

Work load and psychological pressure differ by shift	Frequency	Valid Percent
Disagree	171	41.7
Neutral	29	7.1
Agree	210	51.2
Total	410	100.0

Nurses of the first group agreed with this hypothesis more than the second group.

**Table 103: Comparing between the two groups (H6.3)**

One shift or more than one shift	Work load and psychological pressure differ by shift			Total
	Disagree	Neutral	Agree	
More than one shift Count % within one shift or more than one shift	4 1.0%	16 3.9%	386 95.1%	406 100.0%
One shift Count % within one shift or more than one shift	113 75.3%	5 3.3%	32 21.3%	150 100.0%
Total Count % within one shift or more than one shift	117 21.0%	21 3.8%	418 75.2%	556 100.0%

H6.4 Nurses feel comfortable about night shifts because patients fall asleep and because the hospital provides more amenities for nurses during night shifts

This hypothesis consists of two parts and respondents refused them both, this result agreed with studies conducted previously mentioned that nurses

during night shifts exposed for more fatigue and stress due to reduction of staff number any absence of doctors.

**Tables 104: H6.4 Statistical analysis**

I feel comfortable about night shifts because patients fall asleep	Frequency	Valid Percent
Disagree	230	56.1
Neutral	79	19.3
Agree	101	24.6
Total	410	100.0

**Tables 105: H6.4 Statistical analysis**

The hospital provides more amenities for nurses during night shifts	Frequency	Valid Percent
Disagree	291	71.0
Neutral	57	13.9
Agree	62	15.1
Total	410	100.0

H6.5 Level of performance is affected by staff and supervisor at shifts

*Nurses approved by 59.4% that the level of performance is affected by staff and supervisor at shifts, this agreed with a study for (Anne, et al., 2009) that focused on this issue and mentioned for the importance of supervisor*

*support and team climate in raising the performance level and creation of comfortable working environment.*

Females performance affected by staff and supervisor at shifts more than males, as known that females are more vulnerable to external surroundings and more sensitive in dealing with those around them.

**Table 106: H6.5 Statistical analysis by Gender**

Gender	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
Female	9.7995	1.88271	0.12664	-1.06075	-0.33798	-1.05914	-0.33960
Male	9.0989	1.79185	0.13210				

### H6.6 Companions care for patients, especially at night

Nurses denied that companions help them in providing services for their patients, but they expressed their dismay of their presence where they are causing to disrupt their work.

**Table 107: H6.6 Statistical analysis**

Companions care for patients, especially at night	Frequency	Valid Percent
Disagree	195	47.6
Neutral	69	16.8
Agree	146	35.6
Total	410	100.0

H6.7 Nurses feel annoyed because of frequent demands of pateint's and parents complaints.

This result agreed with the result of a previous study for (Kuhlmann, 2004) that gathered nurses complaints from dealing with patients and their families, the study mentioned for daily suffering from unnecessary questions and demands by patients and their families that consume nurses time.

**Tables 108: H6.7 Statistical analysis**

I feel myself forced to absorb irritation of patient's parents	Frequency	Valid Percent
Disagree	41	10.0
Neutral	48	11.7
Agree	320	78.2
Total	409	100.0

**Tables 109: H6.7 Statistical analysis**

I feel annoyed because of frequent demands of patients	Frequency	Valid Percent
Disagree	116	28.3
Neutral	81	19.8
Agree	213	52.0
Total	410	100.0

Females feel more annoyed than males from patients and their families frequent demand.

**Table 110: H6.7 Statistical analysis by Gender**

Gender	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference When $(\sigma_1)^2 = (\sigma_2)^2$		95% Confidence Interval of the Difference When $(\sigma_1)^2 \neq (\sigma_2)^2$	
				Lower	Upper	Lower	Upper
Female	4.9727	1.13443	0.07648	0.10051	0.35031	0.10105	0.35085
Male	3.8478	1.16351	0.08578				

H6.8 Nurses wish to move to another ward

Nurses have demonstrated their desire to move to another ward due to the difference of work pressure between these wards, nurses stated that work pressure is increasing in some departments such as intensive care and emergency departments.

**Table 111: H6.8 Statistical analysis**

I wish to move to another ward	Frequency	Valid Percent
Disagree	153	37.3
Neutral	57	13.9
Agree	200	48.8
Total	410	100.0

#### H6.9 Nurses wish to have the chance to choose the shift themselves

Nurses expressed considerable support for this hypothesis and this result agreed with previous study for (Bambra, Whitehead, et al, (2008)) mentioned that nurses prefer to choose their shifts so they can plan for leisure time and social contacts improved, this was clear in the study in particular, after applying this system, researchers noticed that there were decrease in absence, fatigue, and complaints about family life, accidents decreased by 20%.

**Table 112: H6.9 Statistical analysis**

I wish I have the chance to choose the shift myself	Frequency	Valid Percent
Disagree	23	5.6
Neutral	43	10.5
Agree	344	83.9
Total	410	100.0

Two demographic variables showed significant difference when this hypothesis analyzed:

**Gender:**

Female nurses supported this hypothesis more than male nurses.

**Table 113: H6.9 Statistical analysis by Gender**

I wish I have the chance to choose the shift myself	Gender		Total	
	Female	Male		
Disagree	Count	11	12	23
	% within I wish I have the chance to choose the shift myself	47.8%	52.2%	100.0%
Neutral	Count	16	27	43
	% within I wish I have the chance to choose the shift myself	37.2%	62.8%	100.0%
Agree	Count	194	145	339
	% within I wish I have the chance to choose the shift myself	57.2%	42.8%	100.0%
Total	Count	221	184	405
	% within I wish I have the chance to choose the shift myself	54.6%	45.4%	100.0%

**Marital Status:**

The group most supported to this hypothesis is the married class, due to the existence of social and family obligations they have more than others.

**Table 114: H6.9 Statistical analysis by Marital Status**

I wish I have the chance to choose the shift myself		Marital status				Total
		Single	Married	Divorced	Widow/er	
Disagree	Count	8	15	0	0	23
	% within I wish I have the chance to choose the shift myself	34.8%	65.2%	.0%	.0%	100.0%
Neutral	Count	19	23	0	1	43
	% within I wish I have the chance to choose the shift myself	44.2%	53.5%	.0%	2.3%	100.0%
Agree	Count	102	238	2	1	343
	% within I wish I have the chance to choose the shift myself	29.7%	69.4%	.6%	.3%	100.0%
Total	Count	129	276	2	2	409
	% within I wish I have the chance to choose the shift myself	31.5%	67.5%	.5%	.5%	100.0%

Both of two groups supported this hypothesis but greatest support was from the first group.

**Table 115: Comparing between the two groups (H6.9)**

One shift or more than one shift		I wish I have the chance to choose the shift myself			Total
		Disagree	Neutral	Agree	
More than one shift	Count	23	43	323	389
	% within one shift or more than one shift	5.9%	11.1%	83.0%	100.0%
One shift	Count	13	26	99	138
	% within one shift or more than one shift	9.4%	18.8%	71.7%	100.0%
Total	Count	36	69	422	527
	% within one shift or more than one shift	6.8%	13.1%	80.1%	100.0%

H6.10 Nurses show great cooperation when exchanging shifts.

Nurses disagreed with this hypothesis.

**Table 116: H6.10 Statistical analysis**

Nurses show great cooperation when exchanging shifts	Frequency	Valid Percent
Disagree	212	51.7
Neutral	58	14.1
Agree	140	34.1
Total	410	100.0

H6.11 Nurses prefer to choose the same shift all the time

Nurses agreed that they prefer to choose the same shift all the time so there will be no rotation in shifts, this result agreed with a study for (Bambra, Whitehead, et al, (2008) that mentioned for improving of health indicators such as improving of sleep quality and duration, in addition of reduction of

sickness absence, also Bambra's study mentioned for reduction in psychological problems after testing this intervention.

**Table 117: H6.11 Statistical analysis**

I prefer to choose the same shift all the time	Frequency	Valid Percent
Disagree	143	34.9
Neutral	108	26.3
Agree	159	38.8
Total	410	100.0

H6.12 Nurses feel that sudden change of shifts is annoying

Nurses agreed with the hypothesis.

**Table 118: H6.12 Statistical analysis**

Nurses feel that sudden change of shifts is annoying	Frequency	Valid Percent
Disagree	32	7.8
Neutral	40	9.8
Agree	338	82.4
Total	410	100.0

The first group agreed with this hypothesis more than the second group.

**Table 119: Comparing between the two groups (H6.12)**

One shift or more than one shift		I feel that sudden change of shifts is annoying			Total
		Disagree	Neutral	Agree	
More than one shift	Count	32	40	319	391
	% within one shift or more than one shift	8.2%	10.2%	81.6%	100.0%
One shift	Count	17	26	96	139
	% within one shift or more than one shift	12.2%	18.7%	69.1%	100.0%
Total	Count	49	66	415	530
	% within one shift or more than one shift	9.2%	12.5%	78.3%	100.0%

### **Hypothesis 7**

H7- Nurses feel satisfied financially and morally.

73.6% of respondents confirmed that Nurses don't feel satisfied financially and morally.

### **Sub Hypothesis:**

H7.1 Nurses feel satisfied with their working conditions

Respondents confirmed by 74.4% that nurses don't feel satisfied with their working conditions.

After this hypothesis was analyzed result showed that nurses working in private hospitals feel more satisfied than whom working in governmental hospitals.

**Table 120: H7.1 Statistical analysis by Workplace**

Workplace	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Governmental hospital	8.0900	2.72931	.19299	7.7094	8.4706
Private hospital	9.5988	2.80905	.21419	9.1760	10.0216
Both Gov. and Pri.	8.0909	2.73695	.82522	6.2522	9.9296
Total	8.7676	2.85895	.14609	8.4804	9.0549

H7.2 Nurses feel satisfied with provision of medical devices

Nurses complained from the lack and conditions of medical equipments.

**Table 121: H7.2 Statistical analysis**

All of the medical equipment are available at my work	Frequency	Valid Percent
Disagree	244	43.5
Neutral	101	18.0
Agree	216	38.5
Total	561	100.0

Nurses working in governmental hospitals suffer more than those working in private hospitals in terms of medical equipments provision.

**Table 122: H7.2 Statistical analysis by Workplace**

All of the medical equipment are available at my work	Workplace			Total
	Governmental hospital	Private hospital	Both Gov. and Pri.	
Disagree Count % within All of the medical equipment are available at my work	176 86.3%	22 10.8%	6 2.9%	204 100.0%
Neutral Count % within All of the medical equipment are available at my work	41 74.5%	11 20.0%	3 5.5%	55 100.0%
Agree Count % within All of the medical equipment are available at my work	78 25.9%	219 72.8%	4 1.3%	301 100.0%
Total Count % within All of the medical equipment are available at my work	295 52.7%	252 45.0%	13 2.3%	560 100.0%

### H7.3 Nurses feel satisfied with their jobs

Nurses answered that they don't feel satisfied in their jobs.

**Table 123: H7.3 Statistical analysis**

I feel satisfied about my current profession	Frequency	Valid Percent
Disagree	189	46.1
Neutral	44	10.7
Agree	177	43.2
Total	410	100.0

#### H7.4 Nurses feel satisfied with their salaries

Nurses answered they don't feel satisfied about their salaries as they answered in the following table:

**Table 124: H7.4 Statistical analysis**

I feel satisfied about my monthly salary	Frequency	Valid Percent
Disagree	290	70.7
Neutral	33	8.0
Agree	87	21.2
Total	410	100.0

H7.5 Nurses feel satisfied with their vacations and leaves Nurses are not satisfied with their vacations and leaves as the following tables show:

**Table 125: H7.5 Statistical analysis**

I feel satisfied about my regular, annual and sick leaves	Frequency	Valid Percent
Disagree	224	54.6
Neutral	63	15.4
Agree	123	30.0
Total	410	100.0

**Table 126: H7.5 Statistical analysis**

I feel satisfied about the leaves during work hours	Frequency	Valid Percent
Disagree	193	47.1
Neutral	80	19.5
Agree	137	33.4
Total	410	100.0

All hypothesis and sub hypotheses results were summarized, each hypothesis with related sub hypotheses presented in a specified table, Appendix C (Table 142: Hypothesis 1 results summary, Table 143: Hypothesis 2 results summary, Table 144: Hypothesis 3 results summary, Table 145: Hypothesis 4 results summary, Table 146: Hypothesis 5 results summary, Table 147: Hypothesis 6 results summary, Table 148: Hypothesis 7 results summary).

## **General Questions**

After answering all hypotheses and clarifying hypotheses have been proven and matching the situation in Palestine with other countries all over the world, some of hypotheses matched its results with previous studies and hypotheses that have been made all over the world, and some conflicted with the Palestinian reality and came with different results from previous studies, general questions were inquired at the end of the questionnaire concerning the Palestinian reality and its impact on the provision of medical services from the point of view of nurses and their vision of the conditions that affect the extent of their ability to give the best.

Answers of these questions came as follows:

- The Palestinian conditions do not encourage giving motivations that lead to job satisfaction.

Nurses approve answered this question by 81.6%

**Table 127: Q1 Statistical analysis**

The Palestinian conditions do not encourage giving motivations that lead to job satisfaction	Frequency	Valid Percent
Disagree	45	8.0
Neutral	58	10.3
Agree	458	81.6
Total	561	100.0

- The lack of medical equipment and medicine leads to insufficient services for patients.

Nurses agreed with this statement 88.2%.

**Table 128: Q2 Statistical analysis**

The lack of medical equipment and medicine leads to insufficient services for patients.	Frequency	Valid Percent
Disagree	28	5.0
Neutral	38	6.8
Agree	495	88.2
Total	561	100.0

- Chaos and failure to maintain order in the Palestinian society affect the level of services provided to patients.

Nurses agreed with this statement 83.4%.

**Table 129: Q3 Statistical analysis**

Chaos and failure to maintain order in the Palestinian society affect the level of services provided to patients	Frequency	Valid Percent
Disagree	28	5.0
Neutral	65	11.6
Agree	468	83.4
Total	561	100.0

- I am keen to describe the cases in an accurate way before the end of my shift.

Nurses agreed with this statement 91.4%, this result agreed with study of (Driscolla T. R. , Grunsteinb R. R. , 2007) that emphasized at importance of documentation of patients situations, although nurses in the study complained from the load result from documentation.

**Table 130: Q4 Statistical analysis**

I am keen to describe the cases in an accurate way before the end of my shift	Frequency	Valid Percent
Disagree	13	2.3
Neutral	35	6.2
Agree	513	91.4
Total	561	100.0

- Nurses fail to document all cases and this causes problems to patients.

Nurses rejected this statement 41.2%.

**Table 131: Q5 Statistical analysis**

Nurses fail to document all cases and this causes problems to patients	Frequency	Valid Percent
Disagree	231	41.2
Neutral	119	21.2
Agree	211	37.6
Total	561	100.0

- Food for patients from outside the hospital causes chaos and absence of hygiene.

Nurses agreed with this statement 80.2%.

**Table 132: Q6 Statistical analysis**

Food for patients from outside the hospital cause chaos and absence of hygiene	Frequency	Valid Percent
Disagree	40	7.1
Neutral	71	12.7
Agree	450	80.2
Total	561	100.0

- The relationship between nurses and patients is not affected by disputes with the hospital management.

Nurses agreed with this statement 72.7%.

**Table 133: Q7 Statistical analysis**

The relationship between nurses and patients is not affected by disputes with the hospital management	Frequency	Valid Percent
Disagree	71	12.7
Neutral	82	14.6
Agree	407	72.7
Total	560	100.0

- Nurses occasionally take training courses.

Nurses rejected this statement 44.7%, this result agreed with an article published in Al-Quds newspaper that mentioned to lack of training courses that employees of Palestinian health care sector in particular nurses receive including practical training, self training and training through workshops and conferences.

**Table 134: Q8 Statistical analysis**

Nurses occasionally take training courses	Frequency	Valid Percent
Disagree	251	44.7
Neutral	112	20.0
Agree	198	35.3
Total	561	100.0

- I think that tips from patients are healthy phenomenon.

Nurses rejected this statement 61.5%.

**Table 135: Q9 Statistical analysis**

I think that tips from patients are healthy phenomenon	Frequency	Valid Percent
Disagree	345	61.5
Neutral	96	17.1
Agree	120	21.4
Total	561	100.0

I take advantage of my work at the hospital to help patients at their homes to improve my financial situation Nurses rejected this statement 51.7%.

**Table 136: Q10 Statistical analysis**

I take advantage of my work at the hospital to help patients at their homes to improve my financial situation	Frequency	Valid Percent
Disagree	290	51.7
Neutral	104	18.5
Agree	167	29.8
Total	561	100.0

All previous general questions answers were summarized in a table, Appendix C (Table 149: General questions results summary).

In an attempt to find a statistic or an answer to such a question, a question was asked in the questionnaire about the ward that nurses see more pressure in working in such wards due to the work pressure. Answers varied, where some of them pointed out that the pressure of work in the open wards such as emergency unit greater than in the closed wards like ICU, as opposed to the other part of this answer and considered that the work pressure in the closed wards greater than in the open wards. The following table shows the order of wards in terms of the pressure of work as stated in the nurses answers:

**Table 137: Arrangement of wards by work pressure**

<b>Ward</b>	<b>Percent%</b>
ICU	24.9
Emergency Unit	21.5
Gynecology Ward	12.6
Surgery Ward	12.3
Internal Medicine Ward	8.5
CCU	5.7
Neonate Ward	3.8
Dialysis Ward	3.5
Oncology Ward	2.2
Pediatric Ward	2.2

## **Chapter Five**

### **Discussion and Recommendations**

#### **5.1 Introduction**

Poor economic conditions and political instability in Palestine in all sectors and areas have the effect on life in the Palestinian society, including the health sector, As a medical staff of nurses, doctors and technicians are part of this sector was a must in this research study of the impact of the Palestinian reality on the medical services provided from the point of view of nurses as one of the problems that prevent them from performing their job to the fullest.

In addition to the main problems they are exposed to like setbacks and health problems and confront them to psychological and social problems because of the nature of their work in shifts as well as to study the factors that determine which of their favorite shifts and the impact of rotation of these shifts among themselves and study of the proposed solutions to these problems.

This chapter will discuss the results of the statistical analysis to reach clear answers to the questions and hypotheses and to achieve the objectives for which research was conducted, in addition to viewing the recommendations that have been out through the interview and ask nurses about their suggestions and what are the solutions that find them suitable for the improvement of their performance.

## **5.2 Results discussion**

The fact that the main objective of this research is to study the work in shifts and its problems, and to study the effect on the performance of nurses, questions were asked and hypotheses were developed to explain the magnitude of the problems and come with possible solutions to mitigate this bad effect, the results were sometimes identical to the previous studies, and sometimes other differed in their results.

The first hypothesis researcher seeks to prove was “Shift work nurses suffering from sleep disturbances which may rise to be chronic insomnia.” To prove this hypothesis a series of questions has been allocated its own part in the questionnaire about sleep problems varied from the small number of hours of sleep and rest, as well as irregularity fatigue, insomnia and lack of appropriate places for their comfort in hospitals. The analysis clearly indicates that nurses suffer from sleep disturbances fatigue. For further clarification average of answers for these questions have been taken and a comprehensive outcome for answers agreed on the obvious suffering of the nurses in this context, sometimes they having drinks and stimulant drugs to maintain their activity and vigilance during the work, but with varying degrees.

The second hypothesis research deal nurses choosing criteria and was “There are certain criteria that should be taken into account upon choosing shift work nurses”, a group of questions was analyzed concerning

this hypothesis, standards that have been focused on by questions were taking into account the age of the nurses and places of residence and their health and social conditions and experiences. After taking the rate of staff responses results of the analysis showed that management do not take into account the conditions of nurses health, social and places of residence, while also showed that what is observed only in the distribution of nurses on shift is find a supervisor for each shift in every department of the hospital has experience in the management of the department and ability to supervise nurses.

The investigation of the third hypothesis was dealing with this statement “Diverse health problems may appear as a result of shift work.” Questions related to this hypothesis covered many aspects related to health conditions of nurses include increase or decrease the weight, chronic diseases or exposure to health setbacks and the common intestinal in addition to increasing the rate of smoking. A lot os opinions confirmed nurses suffering from health problems and chronic diseases caused return to their system work in shifts, as confirmed smokers that the rate of smoking increased also because they have to be awake all night, as some have asserted another disruption weight up or down.

Fourth hypothesis was “Shift work nurses suffering from diverse social and psychological problems due to the nature of their working times.” This hypothesis a large section of the questionnaire has been allocated to discuss this issue since a lot of studies focused on its impact on

nurses, questions varied between reasons and results of social and psychological problems, and results confirmed nurses suffering and instability of family life and exposed to constant psychological pressure affect the progress of their lives where they feel isolated and nervousness and an unable to communicate properly with their families as well as vulnerability to pathological cases and deaths among patients daily.

Fifth hypothesis “Errors and accidents may occur as a result of shift work fatigue and stress.” addressed the issue of nurses exposure to injuries because of fatigue resulted from shift work in addition to the increasing rate of medical errors for the same reason. Questions revolved about injuries nurses may have and being the reason of medical errors, also questions linked between being fatigued and hold them accountable by parents and hospital management in the event of any medical error. Results supported the hypothesis and nurses agreed that personal injuries and medical errors may occur as a result of fatigue caused by shift work, they also agreed that they hold the responsibility in these cases.

Level of stress shift work nurses exposed to was the topic of the sixth hypothesis which was “Level of stress shift work nurses are exposed to differs among hospital departments and time of shifts.” Many factors were investigated in a series of questions ranged between hospital ward, shift, companions, supervisors and colleagues. Nurses told different opinions, proportion of them have confirmed that the pressure of work varies from shift to another and from one department to another; also

supervisors and staff relations may affect the performance of nurses as they answered.

Before the last section of the questionnaire has been allocated to discuss the satisfaction of nurses financially and morally, questions covered their salaries, provision of medical equipments, working environment, vacations and leaves. Overall views of nurses confirmed that assured the dissatisfaction of nurses morally and financially whether in private or governmental hospitals.

### **5.3 Summary and Conclusion**

In light of the increasing number of people in the world and the high standard of living and sophistication of services provided to them from health and education services and entertainment studies had to be the conducted of all the factors that contribute to the advancement and working to improve these services.

Among the most prominent of these issues emerged problems related to health issues and what factors affect them, including the impact of economic, political and social conditions. A highlight has been addressed in several studies around the world regarding human staff working in medical services, in particular hospitals that provide services for patients around the clock, which adopt the shift work system, so staff have to work in shifts. Nurses constitute the largest segment of medical team in hospitals and they complaint frequently from the pressure of work

and being forced to work in shifts, that cause health, psychological and social problems.

Palestinian society as part of these communities had to be the highlight of this problem and work to analyze and come up with recommendations came from the nurses themselves, given the importance of this issue it has formed the subject of this research.

To come with comprehensive analysis of what is caused by working in shifts, questionnaires have been distributed to a sample of nurses in governmental and private hospitals in many governorates, several topics included in this questionnaire, including psychological, social and health problems resulting from work in shifts, also included an analysis of the criteria that are taken into account when distributing shifts, in addition to the factors that increase the pressure of work and the satisfaction of nurses morally and financially. These topics covered in the questionnaire were the main subjects of previous studies around the world that all agreed that shift work cause problems and increase stress nurses exposed to.

The overall conclusion after analyzing the questionnaire was comparable to previous studies where confirmed the existence of health, psychological and social problems caused by shift work, in addition to fatigue and permanent drowsiness that nurses feel, also it was clear from results pressure difference between the departments, shifts and different supervisors and crew on shift.

The results also confirmed the non-observance of the conditions of nurses in the distribution of shifts, with an emphasis on dissatisfaction of shifts nurses morally and financially.

#### **5.4 Nurses Suggestions**

At the end of this analysis; nurses suggestions will be showed in the following table, these suggestions came from the nurses themselves, either through their meeting or through their suggestions that they put in the questionnaire at its final part, these suggestions have varied between their desire to cause a number of management changes, an increase in salaries and incentives, providing the means for their comfort as well as some of the things related to the nature of their shift work. In the following table all suggestions will be mentioned included ratios obtained:

**Table 138: Nurses Suggestions regarding improving their working conditions**

Suggestion	Percent%
Recruiting additional number of nurses to relieve work pressure	38
Provision of medical equipment in addition to hospital beds and comfortable furniture for patients	35
Salary increase and payment in time	28
Incentives financially and morally	25
Join training courses and to share experiences between hospitals	23
Stop favoritism in shifts distribution	21
Division of labor during one shift among nurses to better serve patients.	21
Stop collective punishment	19
Unify working procedures	18
Enhance team work	18
Improve treatment by supervisors and doctors and to show respect for them	18
Nurses requested not to hold them responsible in the event of errors	18
Providing entertainment venues and comfort (TV, Computers, Cafeteria, trips and social activities	16
Comfortable furniture, special areas for prayer and taking rest, areas for dressing, heating and air conditioning.	
Break intervals for rest during working hours	11
Determine specific time for patient visits and to reduce companions orders by increasing awareness of people by increasing people's awareness of nurses burden, as the presence of companions must be a supportive factor for them, not vice versa	7
Taking into consideration conditions of nurses at the distribution of shifts and wards	7
Reducing working hours by dividing working day for four shifts in particular night shift	6
Develop job description so each shift is not responsible for mistakes of the previous shift and insure not to move through hospital wards	5
Increase of vacations or even allowed to take them	4

Distribute nurses on shifts in a better way taking into account presence of nurses with high experience so they consider the needs of wards and patients	
Some nurses have the desire to complete their education and need support in this regard	4
Special incentives for nurses working night shifts and at holidays	4
Regular meetings to discuss issues improving work and to deliver their suggestions and problems	4
Increase monitoring on nurses performance	3
Provide security crew	2
Rotate nurses between departments	2
Providing transportation to facilitate access to hospital at all shifts or transportation allowance	2
Hospitals Infrastructure repair	2
Provide nurseries for the children of nurses	2
Provide housing for nurses	2
Daily regularly meeting before starting the shift	2
Providing meals and drinks	2
Consult with the nurse in the distribution of his/ her shifts/ wards	2
Pharmacies at hospitals have to work shifts like nurses	2
Transfer of nurses who work in shifts after period to clinics that open at daytime only	2
Change working shift hours	2
Developing electronic archive system to have data base about patients between shifts and wards and for long periods	2

## **5.5 Recommendations**

### **5.5.1 Recommendations for nurses management and law authors:**

Recommendations in this research based on the results of the analysis and what emerged from the problems experienced by nurses affected their health and cause psychological and social problems for them what causes the low level of their performance and increase the chance of accidents and errors, also these recommendations were extracted from the suggestions of nurses themselves:

One of the most frequent problems that appeared through analysis was fatigue resulted from work pressure which affect nurses performance, and to solve this issue it was suggested to give nurses breaks during their working hours to be able to restore their activity.

Provision of accommodation and means of comfort, privacy and entertainment must be taken into account by hospitals management, where the provision of such ways, reflect positively on the performance of nurses and makes them feel comfortable and lead them to more of workmanship at work.

It was clear from the results the need to assign a specific time for visits and forcing all to be committed for these regulations, where it is for the benefit of the patient first.

Regular meetings must be held between nurses, their supervisors and hospital management to discuss problems they face and to develop solutions and suggestions to prevent and reduce the occurrence of such problems, in addition to the need of daily short meeting at the beginning of each shift between the staff and shift supervisor.

After results were reviewed nurses suffering from health problems resulted from being shift workers was clear, so periodically tests to check on their health must be conducted both with regard to chronic diseases or screening tests immunity where they are exposed to a healthy successive setbacks in addition to chronic diseases.

Recruiting additional number of nurses to relieve work pressure as the current number of nurses does not fit with the needs of the wards because of the high number of patients in hospitals and the small number of medical staff especially nurses, which can not cover this need.

Provide transportation and housing for nurses work at night shifts to enable them to reach their shifts at the right time, and to reduce daily problems they face during the departure and return of.

Provide psychological support to the nurses as a duty of the hospital administration, which will raise the level of their performance, this support may be in the form of moral incentives, certificates of appreciation, trips and training programs.

Hospitals management have to enhance team work concept at all levels, nurses complained from lack of cooperation between personnel who alternate on one shift where not everyone does his duty to the fullest, in addition to the lack of a good relationship with their supervisors and therefore not being able to resolve the disputes that appear on a daily basis.

Taking into consideration nurses conditions when distributing shifts this was a suggested by nurses where they expressed desire to participate in distributing shifts so they can choose appropriate schedule consistent with their circumstances somewhat.

Transfer of nurses who work in shifts after period to clinics that open at daytime only, this will help them to restore normal life and get rid of the burden of shift work, this solution may be permanently for nurses have long years of services or temporarily for other nurses.

Increase nurses salaries and give them incentives morally and financially will raise the level of their performance, nurses also called for the need to meet the deadlines for the payment of salaries at the end of each month as the delay in the disbursement date negatively affects their performance.

Double shift causes problems for nurses at many levels, nurses who work double shift are exposed to fatigue more than others and lose the ability to do their job properly, where their energy begin to decline gradually until it reaches the lowest level, double shift was one of the major causes of

medical errors accidents so stopping like these shifts will reflect positively on nurses performance.

Developing electronic archive system to have data base about patients between shifts and wards and for long periods, this intervention will reduce the time consumed in daily documentation and in creating patients folders.

Make people aware of the problems of nurses and pressures to which they are exposed by develop awareness banners and posters in the corridors of the hospital, explaining to patients and visitors the burdens faced nurses and the need not to waste their time, also nurses supervisors have to be aware of the daily work pressure nurses suffering from.

### **5.5.2 Suggestions for Future Research**

(a) A comparative study may be conducted but with another target group could be technicians and doctors working shifts.

(b) Appropriate curriculum that is taught in nursing colleges with the practice from the standpoint of nurses and their teachers what contributes to the preset them to run for practical life, including work in shifts.

(c) See how brief the top management is aware of nurses situation and investigate support provided by them.

### **5.5.3 Implication of the study**

After the search is complete and final review of its contents and all the promise of the results it is observed that these result could offer a base of thinking and work for people concerned in this issue on both practical and academic side. From academic side, the literary side in the search provides a broad understanding and deep to the problems of working in shifts in general and the impact of those problems on the nurses in all areas of their lives in particular. From a practical side, more than one party can take advantage of the practical results, nurses and their union may benefit by tapping the results to prove the amount of their suffering and to claim their rights in front of the relevant authorities and obtain compensation and allowances in this regard. In addition to the nurses, the parties responsible for them whether the Ministry of Health, hospital management, or even the parties responsible for them in hospitals whether officials of wards or shift supervisors may benefit from this research during the policy-making related to nurses, both physically in terms of salaries and incentives and allowances, or morally in terms of appreciation of their work and taking into account their conditions in the distribution of shifts and develop criteria for selecting appropriate ones, and relieve the pressures of work around them and to provide a suitable environment to work and to enroll them into training programs and develop a policy for the assessment and other for punishment.

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## Appendices

### Appendix A: Questionnaire

أختي الممرضة/ أخي الممرض ،،،  
تحية طيبة وبعد،

أرجو من حضرتكم قراءة هذه الاستمارة بدقة وإجابة أسئلتها، مؤكداً لكم أن ما تحويه الاستمارة من معلومات لن تستخدم إلا لأغراض البحث العلمي فقط، حيث إن الباحثة هي طالبة في برنامج ماجستير الإدارة الهندسية-جامعة النجاح الوطنية، ويهدف البحث إلى دراسة اثر العمل في نظام الورديات (Shift Work) على أداء الممرضين في المستشفيات الفلسطينية.

"يتترك فارغ" □□□ الرقم المتسلسل للاستمارة

الرجاء وضع دائرة حول رمز الإجابة المناسبة	
البيانات الشخصية	
الجنس:	أ. ذكر      ب. أنثى
العمر:	أ. أقل من 25 سنة      ب. 25-35 سنة      ج. 36-46 سنة      د. 47 فأكثر
المستوى التعليمي:	أ. دون الثانوية      ب. ثانوي      ج. دبلوم      د. بكالوريوس      هـ. ماجستير فأعلى
مكان العمل:	أ. مستشفى حكومي      ب. مستشفى خاص أو أهلي      ج. الاثنان معا      د. أخرى (اذكرها.....)
المسمى الوظيفي:	
عدد سنوات الخبرة:	أ. أقل من 5 سنوات      ب. 5-10 سنوات      ج. 11-15 سنة      د. 16-20 سنة      هـ. 21 فما فوق
نوع الوردية: (يمكنك اختيار أكثر من خيار)	1. وردية صباحية (7 صباحا - 2 ظهرا)      2. وردية مسائية (2 ظهرا - 10 مساء)      3. وردية ليلية (10 مساء - 7 صباحا)
الحالة الاجتماعية:	أ. أعزب      ب. متزوج      ج. مطلق      د. منفصل      هـ. أرمل
عدد الأولاد الذين تعلمهم إن وجد:	أ. لا يوجد أولاد      ب. أقل من 3 أولاد      ج. 3-6 أولاد      د. 7 أولاد فأكثر
الراتب الشهري:	أ. أقل من 2500 شيكل      ب. من 2500-3500 شيكل      ج. أعلى من 3500 شيكل
معدل عدد ساعات النوم اليومية: .....	
فترات الاستراحة المسموح بها أثناء الوردية الواحدة:	أ. أقل من 15 دقيقة      ب. من 16-30 دقيقة      ج. أكثر من 30 دقيقة
هل أنت مدخن؟	أ. نعم      ب. لا
أولاً: الإرهاق واضطرابات النوم	
ما مدى موافقتك على العبارات التالية (الرجاء وضع إشارة X في المكان المناسب)	
#	العبارة
	موافق
	موافق
	محايد
	معارض
	معارض

بشدة (1)	(2)	(3)	(4)	بشدة (5)		
					يسبب لي دوام الورديات الإرهاق والتعب العام	H <sub>1</sub> Q <sub>1</sub>
					أشعر بنعاس دائم نتيجة عملي في نظام الورديات	H <sub>1</sub> Q <sub>2</sub>
					يسيطر عليّ الشعور بالأرق عند خلودي للنوم	H <sub>1</sub> Q <sub>3</sub>
					أشعر بأنني لا أخذ قسطا كافيا من الراحة أثناء عملي	H <sub>1</sub> Q <sub>4</sub>
					برأيي أن معدل ساعات نومي أقل من حاجتي اليومية للنوم	H <sub>1</sub> Q <sub>5</sub>
					يوفر المستشفى مكانا خاصا يسمح للمرضيين بأخذ قسط من الراحة أثناء العمل	H <sub>1</sub> Q <sub>6</sub>
					أستغل أوقات الفراغ أثناء العمل بأخذ قسط من الراحة أو بقبولة قصيرة	H <sub>1</sub> Q <sub>7</sub>
					يوفر المستشفى لي وسائل ترفيهه أثناء دوامي ( تلفاز، حاسوب، انترنت، مشروبات...)	H <sub>1</sub> Q <sub>8</sub>
					اضطر لتناول المشروبات المنبهة للمحافظة على يقظتي أثناء العمل (قهوة، مشروبات طاقة، ...)	H <sub>1</sub> Q <sub>9</sub>
					اضطر لتناول الأدوية المنبهة للمحافظة على يقظتي أثناء العمل	H <sub>1</sub> Q <sub>10</sub>
					يرتبط الارهاق والنعاس لديّ بوردية الليل فقط	H <sub>1</sub> Q <sub>11</sub>
ثانياً: المشاكل الصحية						
ما مدى موافقتك على العبارات التالية (الرجاء وضع إشارة X في المكان المناسب)						
معارض بشدة (1)	معارض (2)	محايد (3)	موافق (4)	موافق بشدة (5)	العبارة	#
					تناول بعض أنواع الوجبات يساعدني على القيام بالأعمال الموكلة إليّ	H <sub>2</sub> Q <sub>1</sub>
					ازداد وزني بسبب عملي في نظام الورديات	H <sub>2</sub> Q <sub>2</sub>
					نقص وزني بسبب عملي في نظام الورديات	H <sub>2</sub> Q <sub>3</sub>
					أصبحت مدخنا نتيجة طبيعة عملي	H <sub>2</sub> Q <sub>4</sub>
					ازداد معدل تدخيني بسبب عملي في نظام الورديات	H <sub>2</sub> Q <sub>5</sub>
					أعاني من أمراض مزمنة نتيجة عملي (ضغط، سكري، .....	H <sub>2</sub> Q <sub>6</sub>
					أعرض لانتكاسات صحية متلاحقة بسبب عملي	H <sub>2</sub> Q <sub>7</sub>
					أشعر بتعب جسيمي نتيجة الضغوطات النفسية أثناء العمل (أمراض سيكوسوماتيكية)	H <sub>2</sub> Q <sub>8</sub>
					أعاني من اضطرابات معوية نتيجة عملي في نظام الورديات (مغص، فقدان شهية، .....	H <sub>2</sub> Q <sub>9</sub>
ثالثاً: المشاكل النفسية والاجتماعية						
ما مدى موافقتك على العبارات التالية (الرجاء وضع إشارة X في المكان المناسب)						
معارض بشدة (1)	معارض (2)	محايد (3)	موافق (4)	موافق بشدة (5)	العبارة	#
					نظرة المجتمع إلى عملي الليلي تؤثر في وضعي النفسي	H <sub>3</sub> Q <sub>1</sub>
					تزداد الخلافات الأسرية عقب عملي في ورديات ليلية	H <sub>3</sub> Q <sub>2</sub>

					H <sub>3</sub> Q <sub>3</sub>	تأثرت علاقاتي الاجتماعية بطبيعة عملي وأصبحت بالجزلة الاجتماعية
معارض بشدة (1)	معارض (2)	محايد (3)	موافق (4)	موافق بشدة (5)	#	العبارة
					H <sub>3</sub> Q <sub>4</sub>	كنت أدرك مسبقاً أن هذه المهنة تسبب مشاكل أسرية
					H <sub>3</sub> Q <sub>5</sub>	أشعر بالإنزعاج نتيجة عملي في أيام العطل الرسمية
					H <sub>3</sub> Q <sub>6</sub>	أعمل في التمريض لأسباب مادية فقط
					H <sub>3</sub> Q <sub>7</sub>	أقدم مساعدة طبية للجيران والأقارب خارج أوقات العمل
					H <sub>3</sub> Q <sub>8</sub>	لدي إستعداد لتقديم مساعدة للمرضى في المستشفى بعد انتهاء وظيفتي وخارج أوقات الدوام
					H <sub>3</sub> Q <sub>9</sub>	تكمُن المشكلة في عملي في نظام الورديات فقط
					10H <sub>3</sub> Q	أفضل الانتقال إلى أي عمل لا يوجد فيه نظام وريديات
					11H <sub>3</sub> Q	أتوجه إلى العمل وأنا مرتاح نفسياً
					12H <sub>3</sub> Q	يبقى تأثير العمل وحالات الوفاة للمرضى ملازمين لي خارج العمل
					13H <sub>3</sub> Q	أشعر بالرضى النفسي عن عملي في التمريض
					14H <sub>3</sub> Q	تتأثر حالتي النفسية بما أراه من معاناة المرضى
					15H <sub>3</sub> Q	أشعر بالتوتر عند مواجهة الحالات المرضية الصعبة أو الحالات الخاصة
					61H <sub>3</sub> Q	التعامل مع مرافقي المرضى يشعرني بالعصبية
					71H <sub>3</sub> Q	يتعامل الأطباء المختصون بفقوية مع الممرضين دون إبداء أي إهتمام بأرائهم
					81H <sub>3</sub> Q	أنوهم بإصابتني بأمراض مماثلة للحالات التي أقوم على رعايتها
رابعاً: المعايير الواجب مراعاتها عند توزيع الورديات على الممرضين						
ما مدى موافقتك على العبارات التالية (الرجاء وضع إشارة X في المكان المناسب)						
معارض بشدة (1)	معارض (2)	محايد (3)	موافق (4)	موافق بشدة (5)	#	العبارة
					H <sub>4</sub> Q <sub>1</sub>	يراعى في توزيع الورديات أعمار الممرضين وأوضاعهم الصحية
					H <sub>4</sub> Q <sub>2</sub>	يتم التفريق بين الذكور والإناث من الممرضين عند توزيع الورديات
					H <sub>4</sub> Q <sub>3</sub>	يراعى في توزيع الورديات سنوات الخبرة للمرضين
					H <sub>4</sub> Q <sub>4</sub>	تُراعى الحالة الاجتماعية ووجود أطفال عند توزيع الورديات على الممرضين
					H <sub>4</sub> Q <sub>5</sub>	يراعى في توزيع الورديات أماكن السكن للممرضين وصعوبة تنقلهم
خامساً: الأخطاء الطبية والحوادث						
ما مدى موافقتك على العبارات التالية (الرجاء وضع إشارة X في المكان المناسب)						
معارض بشدة (1)	معارض (2)	محايد (3)	موافق (4)	موافق بشدة (5)	#	العبارة

					يزداد معدل تعرضي لحوادث وإصابات شخصية نتيجة عملي في نظام الورديات وما يرافقه من إرهاق وفقدان للتركيز	H <sub>5</sub> Q <sub>1</sub>
					تزداد نسبة الاخطاء الطبية نتيجة عملي في نظام الورديات	H <sub>5</sub> Q <sub>2</sub>
					تزداد نسبة الاخطاء الطبية في الورديات الليلية	H <sub>5</sub> Q <sub>3</sub>
					عند وقوعي في خطأ طبي نتيجة التعب والإرهاق يتم تحميلي المسؤولية من قبل أهل المريض	H <sub>5</sub> Q <sub>4</sub>
					عند وقوعي في خطأ طبي نتيجة التعب والإرهاق يتم تحميلي المسؤولية من إدارة المستشفى	H <sub>5</sub> Q <sub>5</sub>

سادساً: العوامل التي تتحكم بحجم ضغط العمل						
ما مدى موافقتك على العبارات التالية (الرجاء وضع إشارة X في المكان المناسب)						
#	العبارة	موافق بشدة (5)	موافق (4)	محايد (3)	معارض (2)	معارض بشدة (1)
H <sub>6</sub> Q <sub>1</sub>	أشعر بالارتياح لوجود أوقات محددة لزيارة المرضى					
H <sub>6</sub> Q <sub>2</sub>	يختلف ضغط العمل والضغط النفسي باختلاف القسم الذي أعمل فيه أذكر الأقسام التي يزيد ضغط العمل فيها عن غيرها من الأقسام					
H <sub>6</sub> Q <sub>3</sub>	يختلف ضغط العمل والضغط النفسي باختلاف الوردية التي أعمل فيها					
H <sub>6</sub> Q <sub>4</sub>	أجد راحة عند اختياري القسم الذي أعمل فيه					
H <sub>6</sub> Q <sub>5</sub>	يتأثر مستوى ادائي باختلاف طاقم العمل المناوب					
H <sub>6</sub> Q <sub>6</sub>	أشعر بالراحة في العمل في الوردية الليلية بسبب نوم المرضى					
H <sub>6</sub> Q <sub>7</sub>	يقدم المرافقون مساعدة من خلال الاعتناء بالمرضى وخاصة أثناء الليل					
H <sub>6</sub> Q <sub>8</sub>	أشعر بالراحة في العمل عند التعامل مع المرضى صغار السن أكثر من كبار السن					
H <sub>6</sub> Q <sub>9</sub>	أفضل العمل بوجود مشرف ذكر					
10H <sub>6</sub> Q	لدي رغبة في الانتقال إلى قسم آخر للعمل فيه					
11H <sub>6</sub> Q	أشعر بالرغبة باختيار الوردية التي أعمل فيها بنفسني					
H <sub>6</sub> Q <sub>12</sub>	ييدي الممرضون فيما بينهم تعاوناً كبيراً في تبادل الورديات					
12H <sub>6</sub> Q	أفضل إختيار الوردية نفسها دائماً					
13H <sub>6</sub> Q	أشعر أن التغيير المفاجئ لتوزيع الورديات هو أمر مزعج					
#	العبارة	موافق بشدة (5)	موافق (4)	محايد (3)	معارض (2)	معارض بشدة (1)
14H <sub>6</sub> Q	يقدم المستشفى وسائل راحة أكثر للمرضى أثناء الوردية الليلية					
15H <sub>6</sub> Q	أشعر بعدم الراحة عند عدم وجود طبيب مختص في القسم الذي أعمل فيه لاضطراري لتحمل المسؤولية					
16H <sub>6</sub> Q	أتحمل المسؤولية الأخلاقية عند تنفيذ أوامر الطبيب عندما تكون النتيجة في غير مصلحة المريض					
17H <sub>6</sub> Q	أجد نفسي مضطراً إلى إستيعاب غضب أهالي المرضى					
H <sub>6</sub> Q <sub>18</sub>	أشعر بالانزعاج نتيجة طلبات المرضى المتكررة					
سابعاً : بيئة العمل والرضى الوظيفي						
كيف تقيم بيئة العمل المحيطة بك من النواحي التالية (الرجاء وضع إشارة X في المكان المناسب)						
#	العبارة	موافق بشدة (5)	موافق (4)	محايد (3)	معارض (2)	معارض بشدة (1)
H <sub>7</sub> Q <sub>1</sub>	المساحة المخصصة لي في العمل (مكتب، كاونتر، ..... ) مناسبة					
H <sub>7</sub> Q <sub>2</sub>	أجد أن التهوية والإنارة في مكان عملي كافيان					

					أتمتع بالخصوصية الكافية في مكان عملي	H7Q3
					تتوفر كافة التجهيزات الطبية التي أستخدمها في عملي	H7Q4
					أرى أن الأثاث المكتبي الخاص بي مناسب	H7Q5
					أشعر بالرضى عن عملي الحالي	H7Q6
					أشعر بالرضى عن راتبي الشهري	H7Q7
					أشعر بالرضى عن الإجازات العادية والمرضية والطارئة	H7Q8
					أشعر بالرضى عن أذونات المغادرة خلال الدوام الرسمي	H7Q9
ثامناً : أسئلة عامة						
ما مدى موافقتك على العبارات التالية (الرجاء وضع إشارة X في المكان المناسب)						
معارض بشدة (1)	معارض (2)	محايد (3)	موافق (4)	موافق بشدة (5)	العبارة	#
					الواقع الفلسطيني لا يساعد على تقديم حوافز تؤدي إلى رضى الموظفين	H8Q1
					نقص التجهيزات الطبية والمعدات والأدوية سيؤدي إلى عدم تقديم خدمة كافية للمرضى	H8Q2
					التسيب وعدم الالتزام بالنظام في المجتمع الفلسطيني يؤثران على مستوى الخدمات المقدمة للمرضى	H8Q3
					أحرص على وصف الحالات المشرف عليها بدقة عند انتهاء وظيفتي وتسليمها إلى زميل آخر	H8Q4
					ينهرب الممرضون من توثيق الحالات ووصفها بدقة لأن ذلك يشكل عبئاً مما يؤثر على مصلحة المرضى	H8Q5
					إدخال الطعام للمرضى من خارج المستشفى يؤدي إلى الفوضى وعدم النظافة	H8Q6
					علاقة الممرضين بالمرضى لا تتأثر بوجود خلافات مع الإدارة	H8Q7
					يتلقى الممرضون دورات تدريبية بين فترة وأخرى	H8Q8
					أعتقد أن الإكراميات من المرضى وذويهم هي ظاهرة صحية	H8Q9
					أستغل عملي كممرض خارج المستشفى لتحسين وضعي المادي من خلال تقديم خدمات طبية للمرضى في بيوتهم	H8Q10
ما هي اقتراحاتك وملاحظاتك لتحسين وتطوير العمل داخل المستشفى						
						1 .....
						2 .....
						3 .....

مع فائق الشكر والامتنان

## Appendix B: Respondents Profile Figures

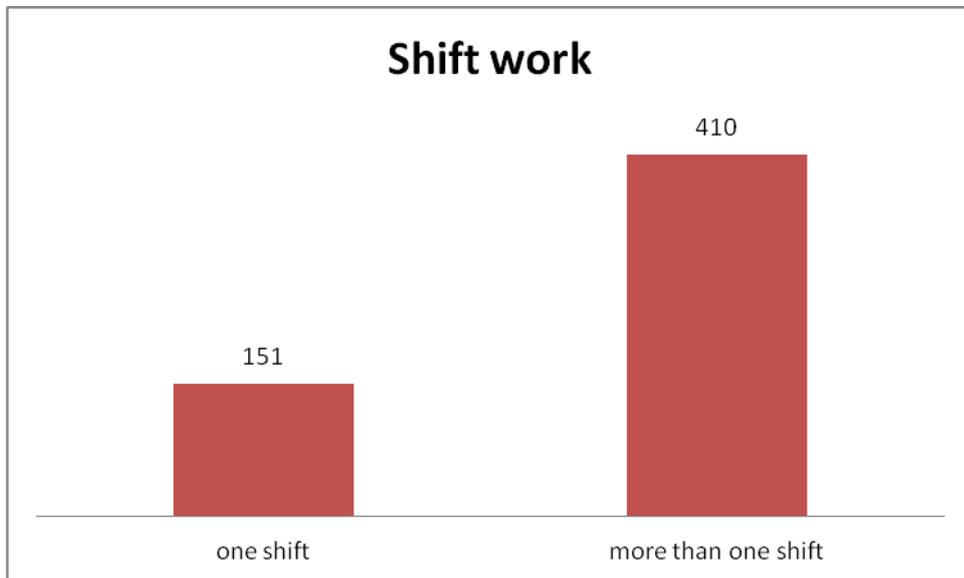


Figure (1): Nurses Distribution by Shifts

### Appendix B1: Profile Figures of Respondents who work more than one shift

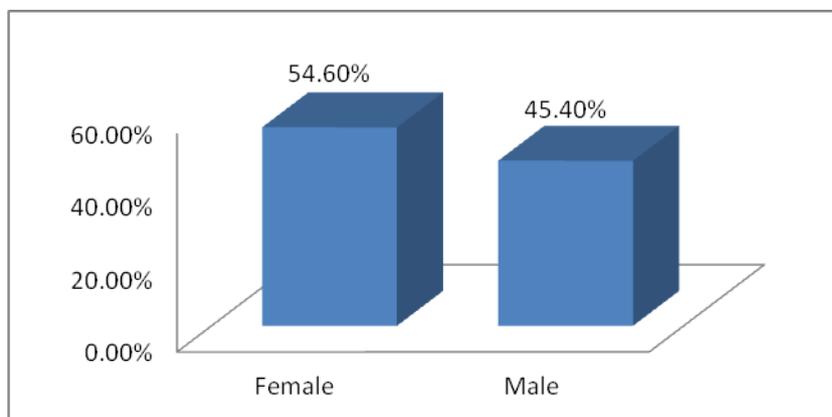
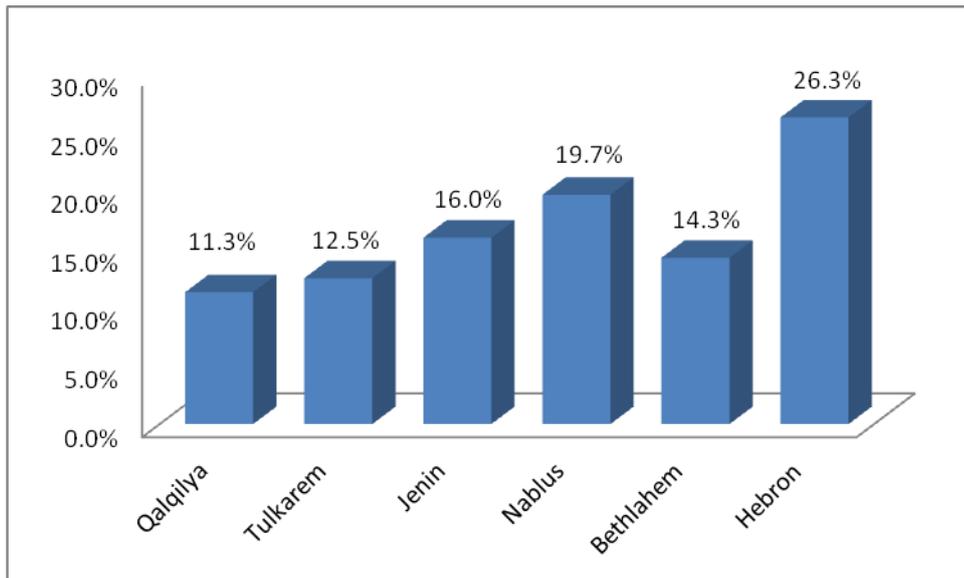
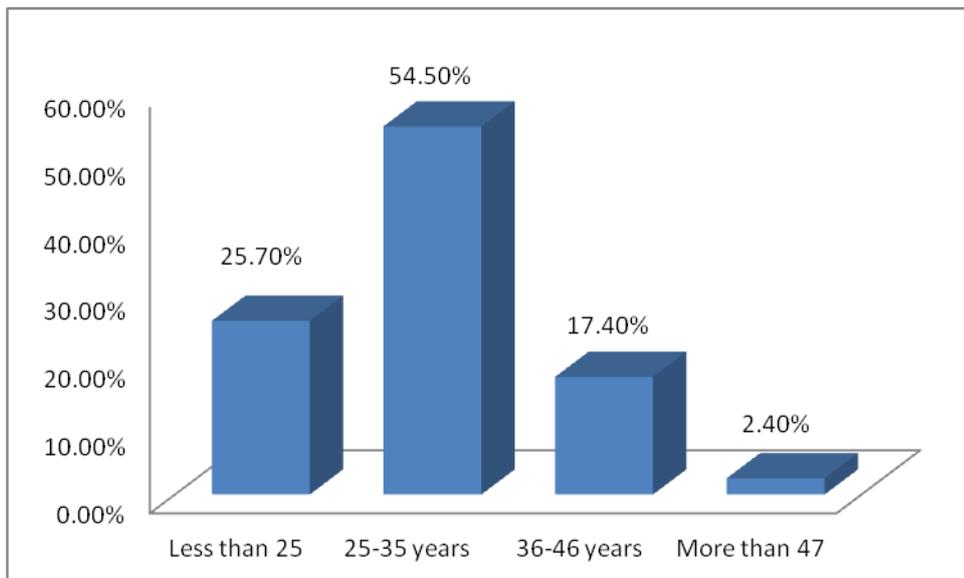


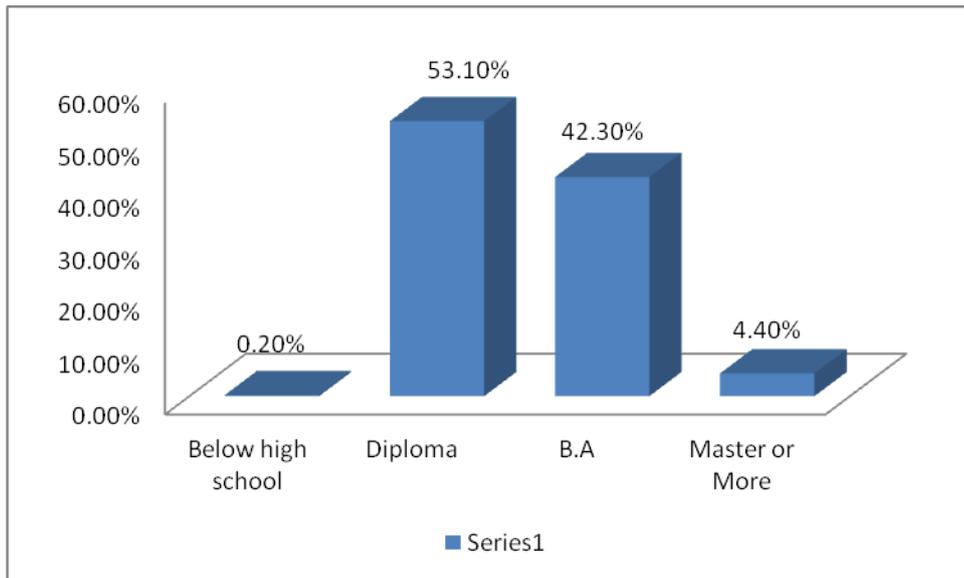
Figure (B1-1): Nurses Distribution by Gender



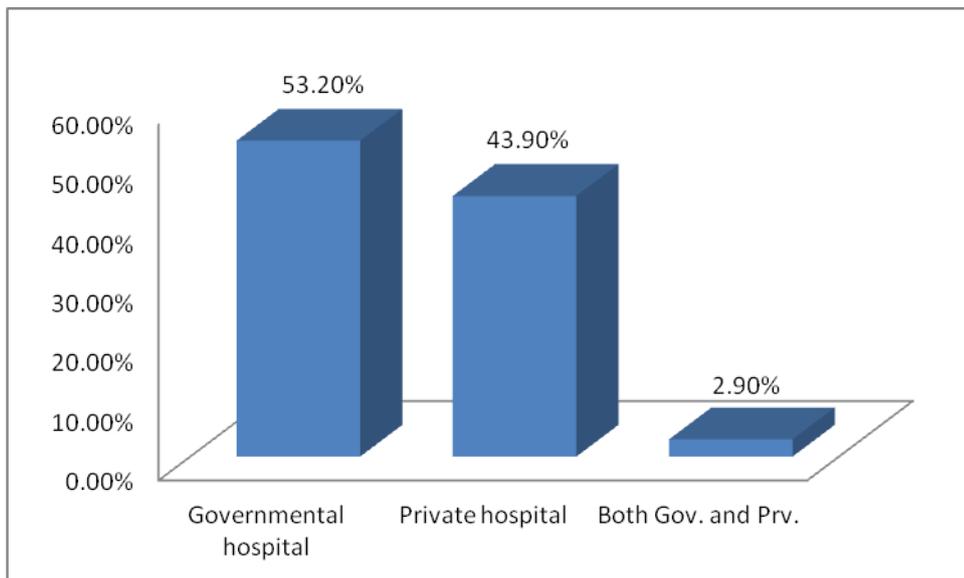
**Figure (B1-2):** Nurses Distribution by Governorate



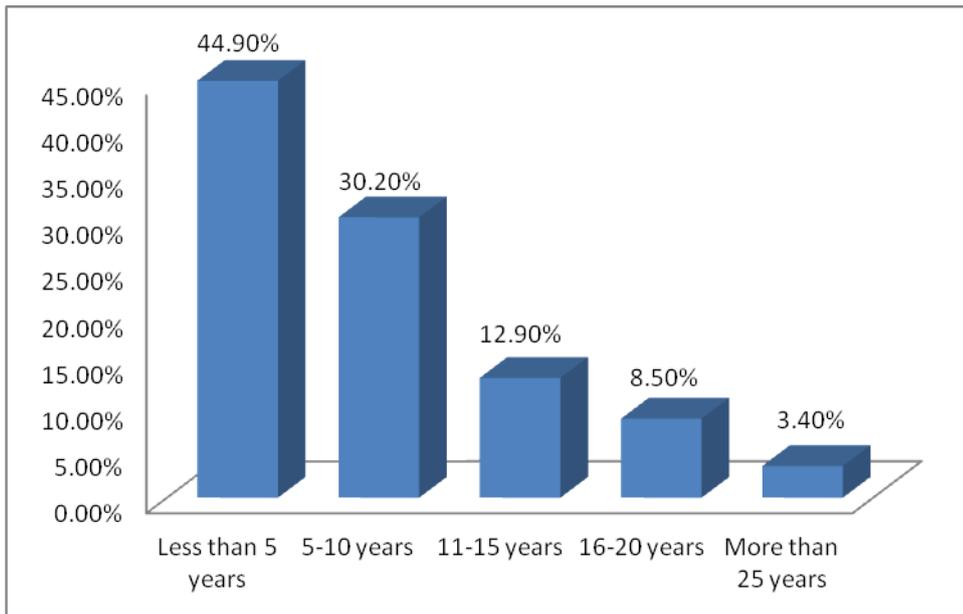
**Figure (B1-3):** Nurses Distribution by Age



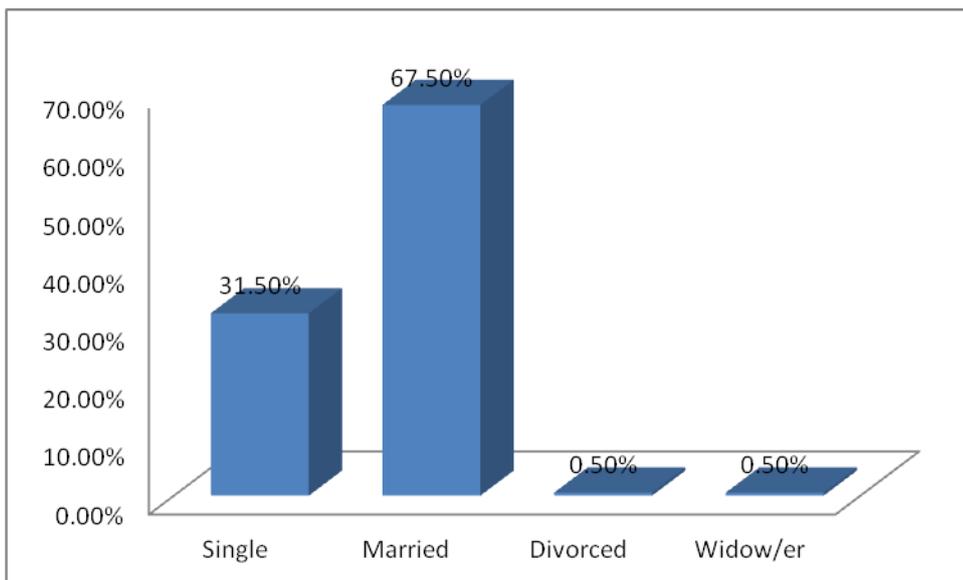
**Figure (B1-4):** Nurses Distribution by Education Level



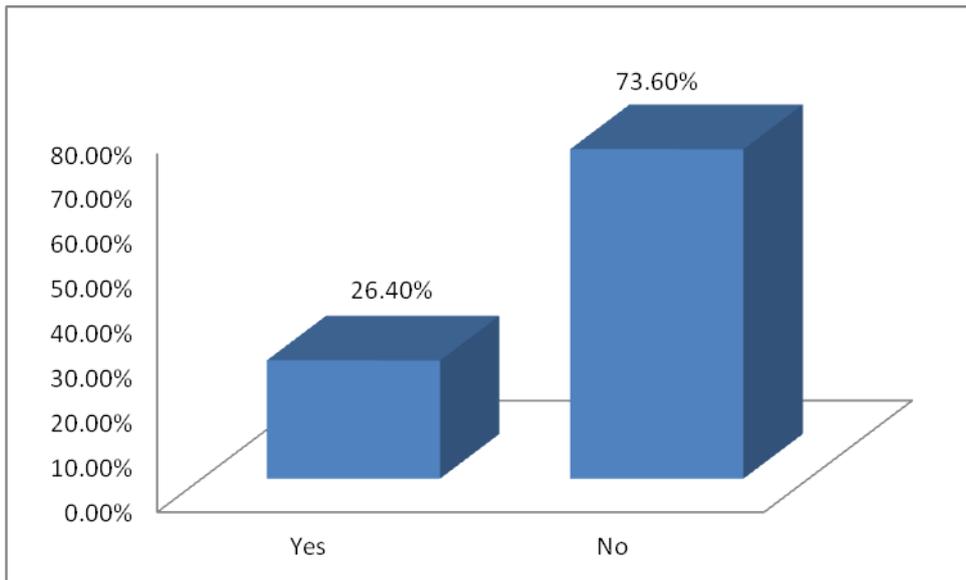
**Figure (B1-5):** Nurses Distribution by Workplace



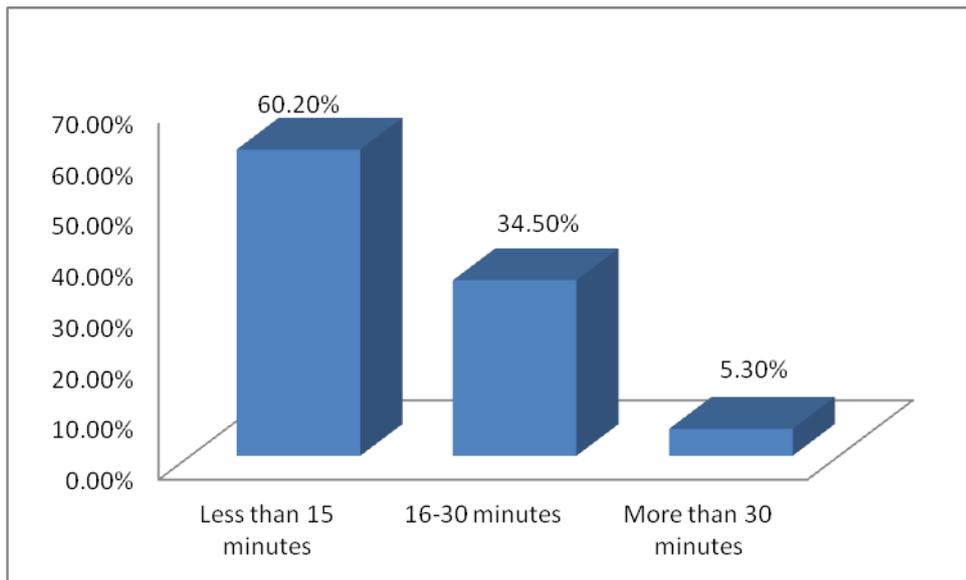
**Figure (B1-6):** Nurses Distribution by Years of Experience



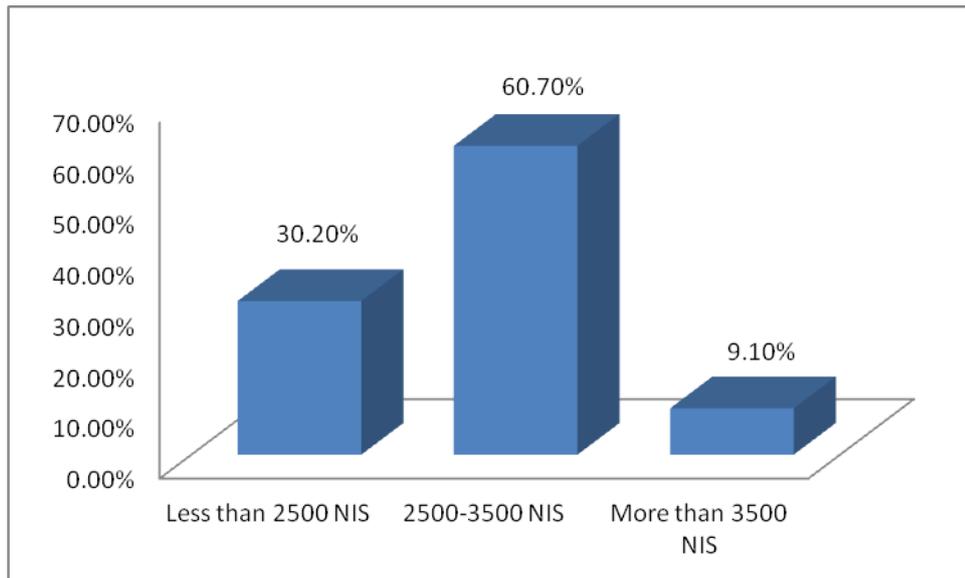
**Figure (B1-7):** Nurses Distribution by Martial Status



**Figure (B1-8):** Nurses Smoking Distribution

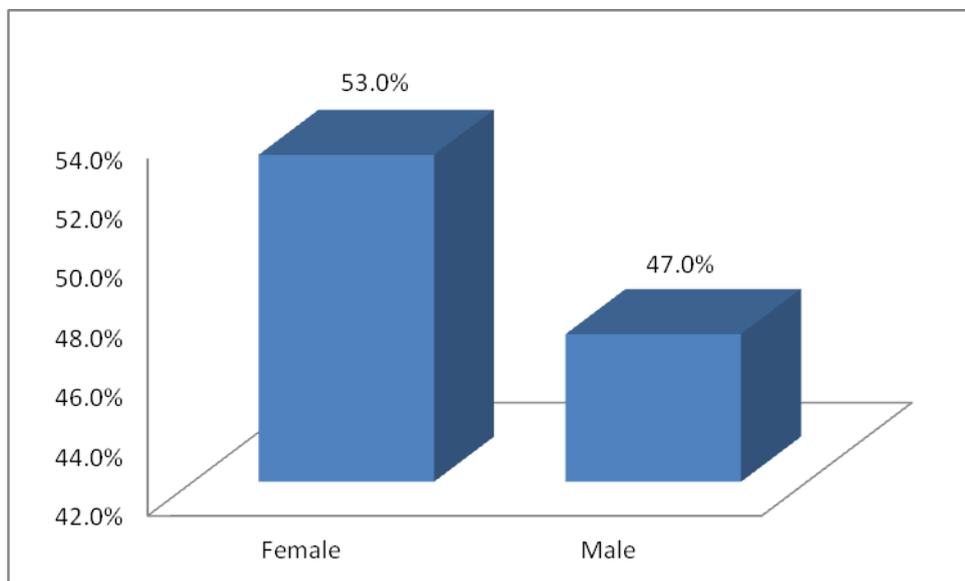


**Figure (B1-9):** Nurses Distribution by Break Intervals

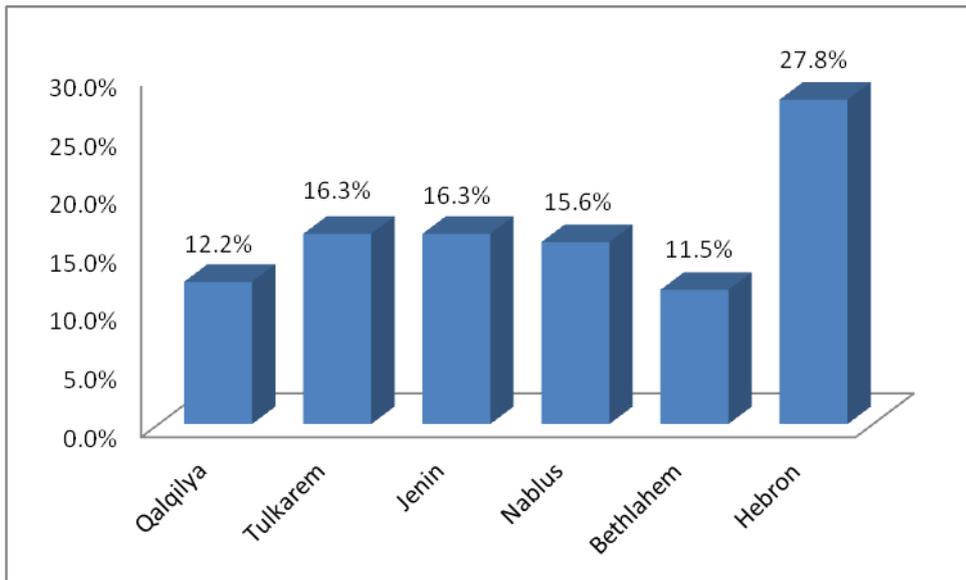


**Figure (B1-10):** Nurses Distribution by Monthly Salary

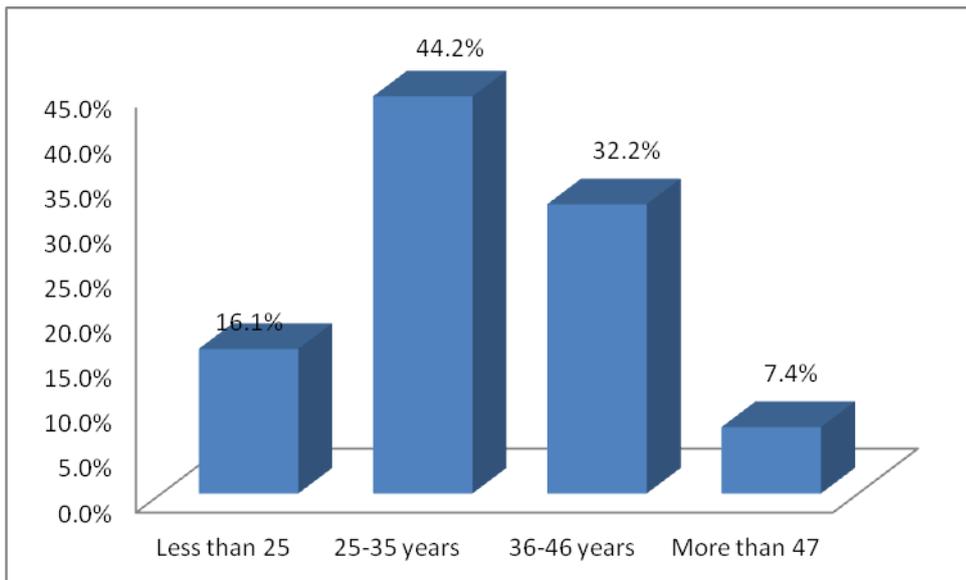
### **Appendix B2: Profile Figures of Respondents who work one shift**



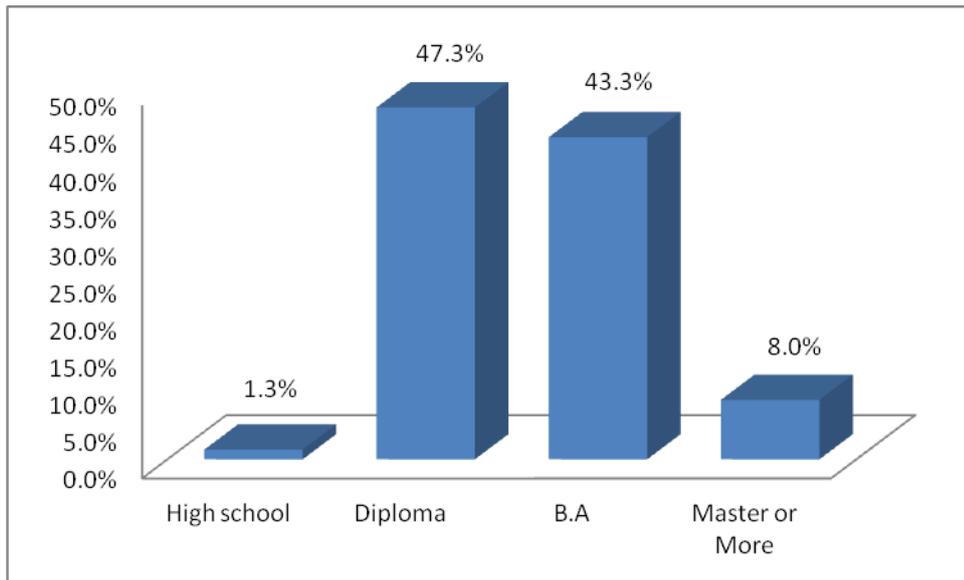
**Figure (B2-1):** Nurses Distribution by Gender



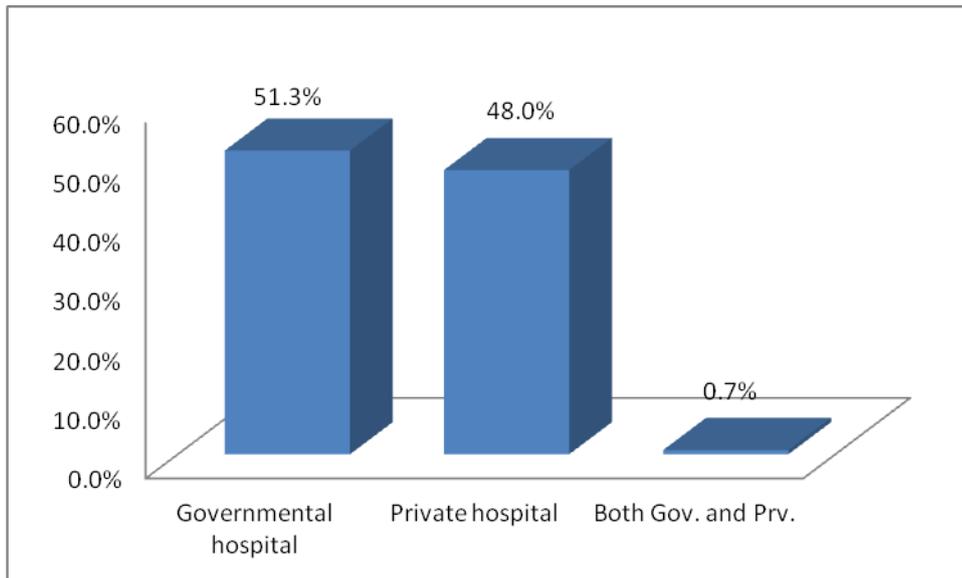
**Figure (B2-2):** Nurses Distribution by Governorate



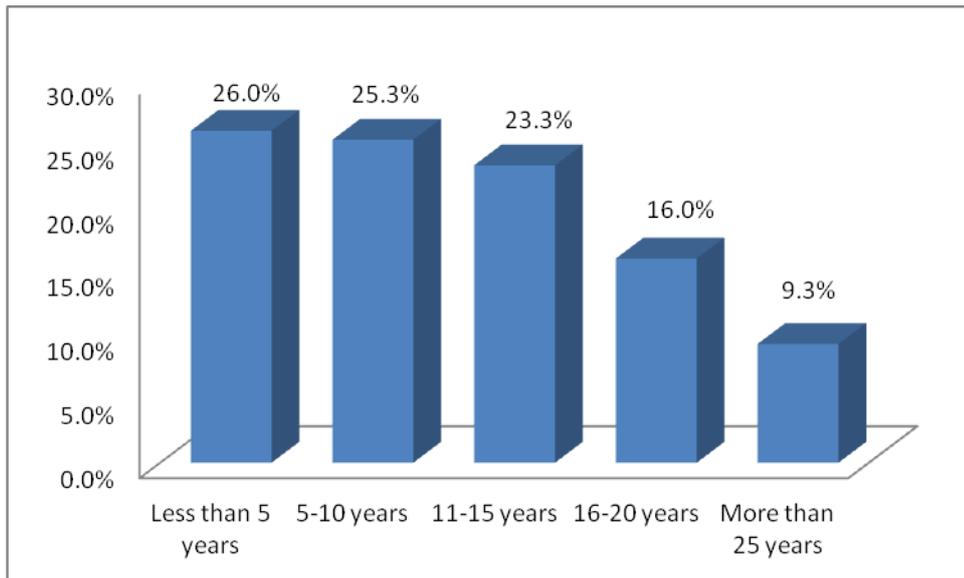
**Figure (B2-3):** Nurses Distribution by Age



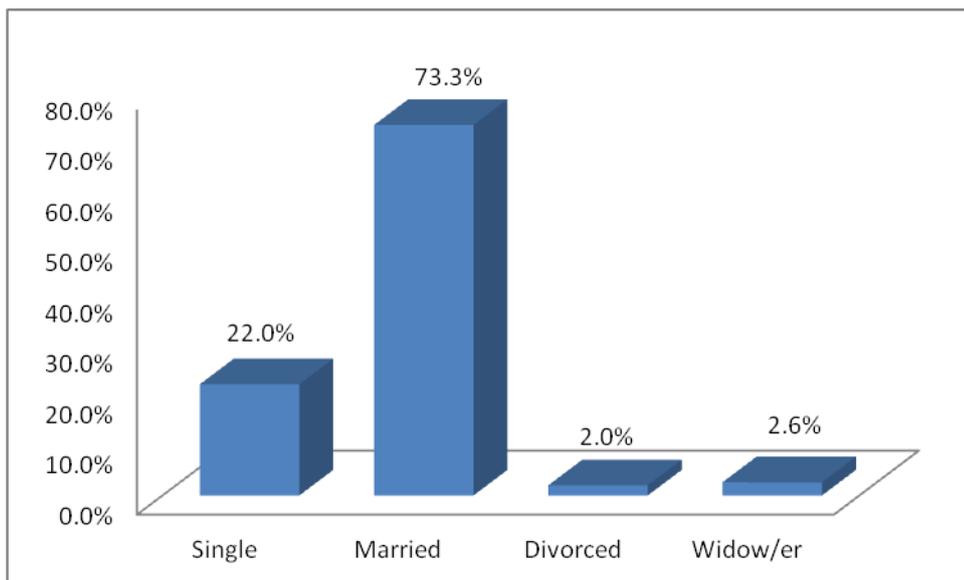
**Figure (B2-4):** Nurses Distribution by Education Level



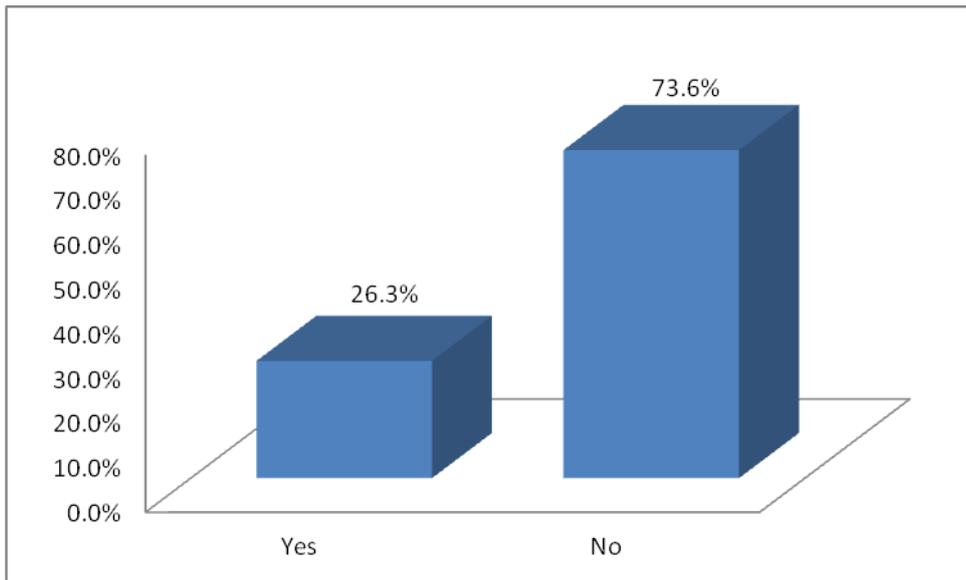
**Figure (B2-5):** Nurses Distribution by Workplace



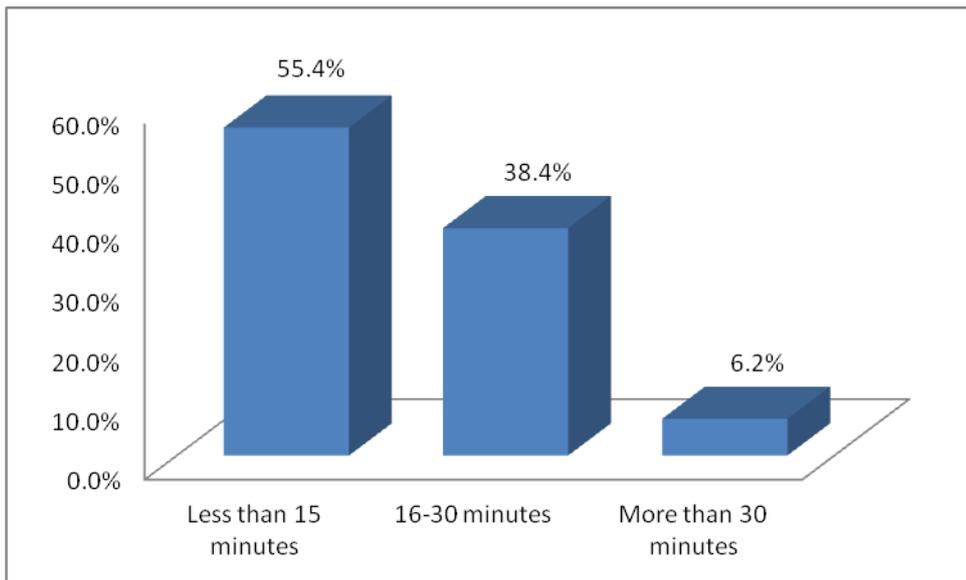
**Figure (B2-6):** Nurses Distribution by Years of Experience



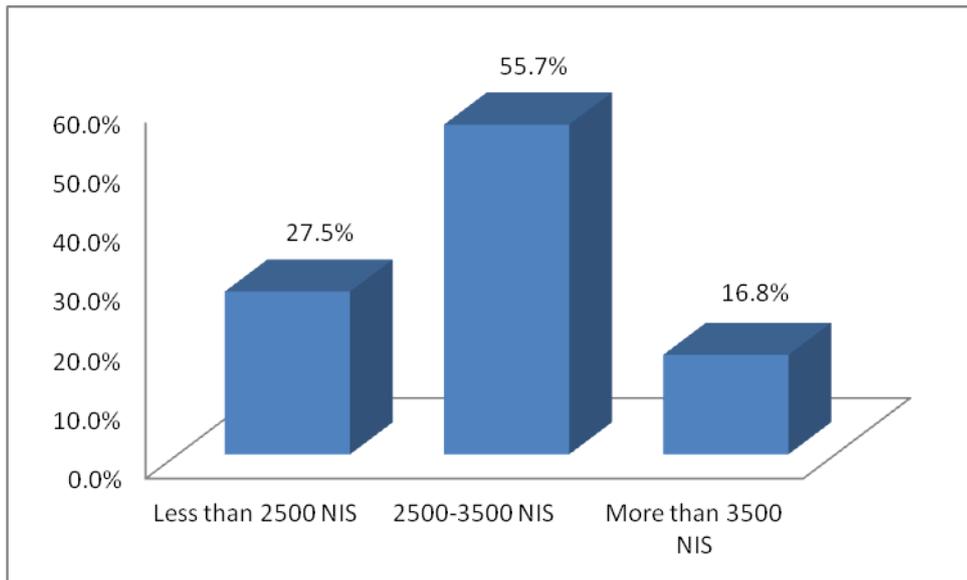
**Figure (B2-7):** Nurses Distribution by Marital Status



**Figure (B2-8):** Nurses Smoking Distribution



**Figure (B2-9):** Nurses Distribution by Break Intervals



**Figure (B2-10):** Nurses Distribution by Monthly Salary

## Appendix C: Cronbach's Alpha

**Table 139: Cronbach's Alpha for questionnaire hypothesis.**

Hypothesis	Cronbach's Alpha	No. of Items
H1.1	.717	5
H1.2	.686	3
H1.3	.333	2
H2.1	.242	2
H2.2	.877	2
H2.3	.575	3
H3.1	.504	8
H3.2	.561	4
H3.3	.445	2
H4	.739	5
H5.4	.687	2
H6.2	.213	2
H6.4	.344	2
H6.5	.394	4
H6.7	.259	2
H7.1	.792	4
H7.5	.765	2

### Appendix D: Tables

**Table 140: Demographic analysis for nurses work more than one shift (410 Nurse)**

Demographic Variables	Categories	Frequency	Valid Percent%
<b>Gender</b>	Female	221	54.6
	Male	184	45.4
<b>Governorate</b>	Qalqilya	36	8.3
	Tulkarem	41	10.5
	Jenin	55	13.5
	Ramallah	60	14.7
	Nablus	70	17.7
	Bethlehem	48	11.8
	Hebron	97	23.8
	<b>Age</b>	Less than 25	105
25-35 years		223	54.5
36-46 years		71	17.4
More than 47		10	2.4
<b>Educational level</b>	Below high school	1	.2
	Diploma	217	53.1
	B.A	173	42.3
	Master or More	18	4.4
<b>Place of Work</b>	Governmental hospital	218	53.2
	Private hospital	180	43.9
	Both Gov. and Prv.	12	2.9
<b>Years of Experience</b>	Less than 5 years	184	44.9
	5-10 years	124	30.2
	11-15 years	53	12.9
	16-20 years	35	8.5
	More than 25 years	14	3.4
<b>Marital Status</b>	Single	129	31.5
	Married	276	67.5
	Divorced	2	.5
	Widow/er	2	.5
<b>Smoking</b>	Yes	105	26.4
	No	293	73.6
<b>Break Interval</b>	Less than 15 minutes	237	60.2
	16-30 minutes	136	34.5
	More than 30 minutes	21	5.3
<b>Monthly Salary</b>	Less than 2500 NIS	123	30.2
	2500-3500 NIS	247	60.7
	More than 3500 NIS	37	9.1

**Table 141: Demographic analysis for nurses work one shift (151 Nurse)**

<b>Demographic Variables</b>	<b>Categories</b>	<b>Frequency</b>	<b>Valid Percent%</b>
<b>Gender</b>	Female	79	53.0
	Male	70	47.0
<b>Governorate</b>	Qalqilya	15	10.2
	Tulkarem	21	14.3
	Jenin	21	14.3
	Ramallah	18	12.3
	Nablus	20	13.6
	Bethlehem	14	9.6
	Hebron	38	25.9
	<b>Age</b>	Less than 25	24
	25-35 years	66	44.3
	36-46 years	48	32.2
	More than 47	11	7.4
<b>Educational level</b>	High school	2	1.3
	Diploma	71	47.3
	B.A	65	43.3
	Master or More	12	8.0
<b>Place of Work</b>	Governmental hospital	77	51.3
	Private hospital	72	48.0
	Both Gov. and Priv.	1	.7
<b>Years of Experience</b>	Less than 5 years	39	26.0
	5-10 years	38	25.3
	11-15 years	35	23.3
	16-20 years	24	16.0
	More than 25 years	14	9.3
<b>Marital Status</b>	Single	33	22.0
	Married	110	73.3
	Divorced	3	2.0
	Widow/er	4	2.7
<b>Smoking</b>	Yes	39	26.4
	No	109	73.6
<b>Break Interval</b>	Less than 15 minutes	81	55.5
	16-30 minutes	56	38.4
	More than 30 minutes	9	6.2
<b>Monthly Salary</b>	Less than 2500 NIS	41	27.5
	2500-3500 NIS	83	55.7
	More than 3500 NIS	25	16.8

**Table 142: Hypothesis 1 results summary**

No.	Sub Hypothesis	Result	Comparison between the two groups	Demographic variables showed significant differences
H1.1	Nurses who work in shifts do not take enough hours for sleeping and rest so they feel tired and sleepy all the time.	82.2% of respondents accepted the hypothesis	The first group is suffering more than the second one	Age: The problem increases with aging The presence of children: The problem increases with the increasing number of children Smoking: Smokers suffer more than Non-Smokers Break Interval: The problem increases with short breaks
H1.2	Nurse who work in shifts do not have special place in the hospital for to take a break and do not have entertainment (TV, PC, Internet, beverages,...)	Results showed inability of nurses to take a break and the lack of places dedicated to the comfort and the failure of the hospital to provide the means for their entertainment	The first group is suffering more than the second one	_____
H1.3	Nurse who work in shifts take stimulant beverages and drugs to stay awake	Results showed that nurses have to take stimulant drinks and sometimes they may have to take stimulant medications, but lower rates of stimulant drinks	_____	Smoking: Non-smokers suffer more than smokers Gender: Females take stimulant beverages and drugs to stay awake more than males
H1.4	Fatigue and drowsiness are only associated with night shifts	Results showed that fatigue and drowsiness are not associated with night shifts and accompanying them in all shifts	_____	_____

**Table 143: Hypothesis 2 results summary**

No.	Sub Hypothesis	Result	Comparison between the two groups	Demographic variables showed significant differences
H2.1	Nurses working in shifts system suffering from decrease or increase in weight as a result of the different system of their lives and their diet	Results showed that respondents accepted this hypothesis but not significantly specially the weight loss one	Weights of the first group is affected more than second group whom working in one shift	Gender: Females affected more than males
H2.2	Smoking levels between nurses may increase as a result of shift work	Result showed that smoking rate of smokers increased due to their work system, but non-smokers did not become smokers	problem of smoking had the greatest impact on the first group	Smoking: smoking increased among younger age groups
H2.3	Nurses became Susceptible to chronic diseases, frequent health setbacks and intestinal disorders due to shift work	results showed that nurses are more likely than others to health problems and increase their exposure to health setbacks and intestinal disorders	_____	Age: Older age group are more likely to suffer from this problem

**Table 144: Hypothesis 3 results summary**

No.	Sub Hypothesis	Result	Comparison between the two groups	Demographic variables showed significant differences
H3.1	Nurses work in shifts suffering from psychological problems due to work pressure	70.6% of Nurses work in shifts suffering from psychological problems	First group is suffering more than the second one	Salary Scale: The highest group accepted the hypothesis is the group of the lowest salaries
				Break Interval: The highest group accepted the hypothesis is the group of the lowest break intervals
				Place of Work: Nurses work in governmental hospitals suffer more than those working in private hospitals
H3.2	Nurses work in shifts suffering from social problems due to work pressure	68.4% of Nurses work in shifts suffering from social problems due to work pressure	The first group is suffering more than the second one	Gender: Shift work causes more social problems for females
				Marital Status: Married, divorced, widow/r are suffering from social problems resulted from shift work more than singles
				The Presence of children: Suffering of social problems increases as the number of children
H3.3	Nurses offer medical help for neighbors and relatives outside hospital and for hospital patients after their shifts	Nurses expressed their willingness to provide medical services and to help their relatives and neighbors outside the hospital and outside working hours, but they are not willing to stay	—————	—————

		in the hospital and provide services for patients after their shifts, they are leaving hospital quickly		
H3.4	The only problem about work is shift work system	More than half responded that the problem in their work lies in the nature of their work in shifts	—————	Gender: females consider shift work is the major problem of their work more than males
				Marital Status: Married form the largest percentage of those who considered that their problem lies in their work in shifts
				The presence of children: Nurses that have children form the largest percentage of those who considered that their problem lies in their work in shifts
H3.5	Nurses prefer to move to another profession where there is not shift work system	Large proportion of respondents expressed their desire to move to another job where there is no shifts system	—————	Gender: Females expressed their desire to move to another job where there are no shifts more than males
				Marital Status: All of marital status (married, divorced, widow/er) have the desire to move to another job more than singles
				The presence of children: Respondents who have children have the desire to move to another job without shifts more than who do not have children

**Table 145: Hypothesis 4 results summary**

No.	Sub Hypothesis	Result	Comparison between the two groups	Demographic variables showed significant differences
H4.1	Distribution of shifts takes into account age and health condition of patients	The largest percentage of respondents answered that supervisors do not take into account the situation of nurses health and their age when the distributing shifts	_____	_____
H4.2	Male and female nurses are distinguished when distributing shifts	Results showed that gender is considered when shifts distributed	_____	_____
H4.3	Distribution of shifts takes into account years of nurses' experience	Result showed that years of experience and presence of supervisor are considered when distributing shifts	_____	Years of Experience: The group most in favor of this hypothesis is nurses with higher years of experience than others
H4.4	Social conditions and existence of children are taken into account when distributing shifts	Nurses rejected the hypothesis	_____	Gender: Females opposed this hypothesis
				Marital Status: The group most opposed to this hypothesis is the married class
				The presence of children: Nurses who have children disagreed with this hypothesis more than whom do not have children
H4.5	Distribution of shifts takes into account residence	Respondents answered that their transportation	_____	Gender: Females complained more than males

	of nurses and transportation issues	issues and residence are not taken into account when distributing shifts		Marital Status: The group most opposed to this hypothesis is the married class
				The presence of children: The group most opposed to this hypothesis is the class of nurses who have children

**Table 146: Hypothesis 5 results summary**

No.	Sub Hypothesis	Result	Comparison between the two groups	Demographic variables showed significant differences
H5.1	Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration	Nurses agreed in their questionnaires that they could be injured or face accidents due to fatigue and shift work stress	The first group of nurses work more than one shift agreed with this hypothesis more than the second group	Break intervals: Nurses who take short break intervals are more likely to have personal injuries and accidents
H5.2	Percentage of medical errors increases as a result of shift work system	Most of nurses agreed with this hypothesis and they find that medical errors may happen as a result of shift work stress and fatigue	Nurses work in more than one shift formed the highest percent of those who agreed with this hypothesis	Years of experience: The most daring group was nurses have the longest period of experience they approved that medical errors could increase as a result of shift work
H5.3	Percentage of medical errors increases during night shifts	Around half of respondents supported this hypothesis that night shift could have medical errors more than other shifts	The first group of nurses agreed with this hypothesis more than the second group	Years of experience: Most of nurses agreed with the hypothesis were from the group of the highest years of experience
				Gender: results showed that males agreed with this hypothesis more than females
H5.4	When a medical error occurred because of fatigue, I am held responsible by hospital administration and patient family	Results showed that both patients families and hospital administration blame nurses	—————	—————

**Table 147: Hypothesis 6 results summary**

No.	Sub Hypothesis	Result	Comparison between the two groups	Demographic variables showed significant differences
H6.1	Nurses feel comfortable when there is specific time for patient visits	Result showed satisfaction with nurses when there are specific times for visit	The first group agreed with it more than second group	_____
H6.2	Work load and psychological pressure differ by ward	Nurses agreed that hospital ward differ among themselves in terms of work load and psychological pressure	_____	_____
H6.3	Work load and psychological pressure differ by shift	Nurses agreed with this hypothesis more than nurses didn't agree	Nurses of the first group agreed with this hypothesis more than the second group	_____
H6.4	Nurses feel comfortable about night shifts because patients fall asleep and because the hospital provides more amenities for nurses during night shifts	This hypothesis consists of two parts and respondents refused them both	_____	_____
H6.5	Level of performance is affected by staff and supervisor at shifts	59.4% of nurses approved that the level of performance is affected by staff and supervisor at shifts	_____	Gender: Females performance affected by staff and supervisor at shifts more than males
H6.6	Companions care for patients, especially at night	Nurses denied that companions help them in providing services for their patients	_____	_____
H6.7	Nurses feel annoyed because of frequent demands of	Nurses agreed on this hypothesis	_____	Gender: Females feel more annoyed than males from

	patient's and parents complaints			patients and their families frequent demand
H6.8	Nurses wish to move to another ward	Nurses have demonstrated their desire to move to another job and this means they do not want to work in a certain shift and limit their work in the rest of the shifts	_____	_____
H6.9	Nurses wish to have the chance to choose the shift themselves	Nurses expressed considerable support for this hypothesis	Both of two groups supported this hypothesis but greatest support was from the first group	Gender: Females supported this hypothesis more than males
				Marital Status: The group most supported to this hypothesis is the married class
H6.10	Nurses show great cooperation when exchanging shifts	Nurses disagreed with this hypothesis	_____	_____
H6.11	Nurses prefer to choose the same shift all the time	Nurses agreed that they prefer to choose the same shift all the time	_____	_____
H6.12	Nurses feel that sudden change of shifts is annoying	Nurses agreed with the hypothesis	The first group agreed with this hypothesis more than the second group	_____

**Table 148: Hypothesis 7 results summary**

No.	Sub Hypothesis	Result	Comparison between the two groups	Demographic variables showed significant differences
H7.1	Nurses feel satisfied with their working conditions	74.4% of respondents confirmed that Nurses don't feel satisfied with their working conditions	_____	Place of work: Nurses working in private hospitals feel more satisfied than whom working in governmental hospitals
H7.2	Nurses feel satisfied with provision of medical devices	Nurses complained from the lack and conditions of medical equipments	_____	Place of work: Nurses working in governmental hospitals suffer more than those working in private hospitals
H7.3	Nurses feel satisfied with their jobs	Nurses answered that they don't feel satisfied in their jobs	_____	_____
H7.4	Nurses feel satisfied with their salaries	Nurses answered they don't feel satisfied about their salaries	_____	_____
H7.5	Nurses feel satisfied with their vacations and leaves	Nurses are not satisfied with their vacations and leaves	_____	_____

**Table 149: General questions results summary**

Question	Approval rate between nurses
The Palestinian conditions do not encourage giving motivations that lead to job satisfaction	81.6
The lack of medical equipment and medicine leads to insufficient services for patients	88.2
Chaos and failure to maintain order in the Palestinian society affect the level of services provided to patients	83.4
I am keen to describe the cases in an accurate way before the end of my shift	91.4
Nurses fail to document all cases and this causes problems to patients	37.6
Food for patients from outside the hospital cause chaos and absence of hygiene	80.2
The relationship between nurses and patients is not affected by disputes with the hospital management	72.7
Nurses occasionally take training courses	35.3
I think that tips from patients are healthy phenomenon	21.4
I take advantage of my work at the hospital to help patients at their homes to improve my financial situation	29.8

**Table 67: H3.4 Statistical analysis by Marital status**

The only problem about my work is shift work system		Marital status				Total
		Single	Married	Divorced	Widow/er	
Disagree	Count	37	51	0	0	88
	% within The only problem about my work is shift work system	42.0%	58.0%	.0%	.0%	100.0%
Neutral	Count	32	48	0	0	80
	% within The only problem about my work is shift work system	40.0%	60.0%	.0%	.0%	100.0%
Agree	Count	60	177	2	2	241
	% within The only problem about my work is shift work system	24.9%	73.4%	.8%	.8%	100.0%
Total	Count	129	276	2	2	409
	% within The only problem about my work is shift work system	31.5%	67.5%	.5%	.5%	100.0%

**Table 68: H3.4 Statistical analysis by Presence of Children**

The only problem about my work is shift work system		No of children				Total
		None	Less than 3	3-6	More than 7	
Disagree	Count	102	27	15	1	145
	% within The only problem about my work is shift work system	70.3%	18.6%	10.3%	.7%	100.0%
Neutral	Count	41	17	15	2	75
	% within The only problem about my work is shift work system	54.7%	22.7%	20.0%	2.7%	100.0%
Agree	Count	30	89	64	7	190
	% within The only problem about my work is shift work system	15.8%	46.8%	33.7%	3.7%	100.0%
Total	Count	173	133	94	10	410
	% within The only problem about my work is shift work system	42.2%	32.4%	22.9%	2.4%	100.0%

**Table 76: H4.3 Statistical analysis by Years of Experience**

Distribution of shifts takes into account years of nurses' experience		Years of experience					Total
		Less than 5 years	5-10 years	11-15 years	16-20 years	More than 25 years	
Disagree	Count	122	92	2	5	4	225
	% within Distribution of shifts takes into account years of nurses' experience	54.2%	40.9%	.9%	2.2%	1.8%	100.0%
Neutral	Count	31	17	0	3	1	52
	% within Distribution of shifts takes into account years of nurses' experience	59.6%	32.7%	.0%	5.8%	1.9%	100.0%
Agree	Count	31	15	51	27	9	133
	% within Distribution of shifts takes into account years of nurses' experience	23.3%	11.3%	38.3%	20.3%	6.8%	100.0%
Total	Count	184	124	53	35	14	410
	% within Distribution of shifts takes into account years of nurses' experience	44.9%	30.2%	12.9%	8.5%	3.4%	100.0%

**Table 79: H4.4 Statistical analysis by Marital status**

Social conditions and existence of children are taken into account when distributing shifts	Marital status				Total
	Single	Married	Divorced	Widow/er	
Disagree Count % within Social conditions and existence of children are taken into account when distributing shifts	55 24.8%	166 74.8%	1 .5%	0 .0%	222 100.0%
Neutral Count % within Social conditions and existence of children are taken into account when distributing shifts	31 43.1%	41 56.9%	0 .0%	0 .0%	72 100.0%
Agree Count % within Social conditions and existence of children are taken into account when distributing shifts	69 60.0%	43 37.4%	1 .9%	2 1.7%	115 100.0%
Total Count % within Social conditions and existence of children are taken into account when distributing shifts	129 31.5%	276 67.5%	2 .5%	2 .5%	409 100.0%

**Table 80: H4.4 Statistical analysis by Presence of Children**

Social conditions and existence of children are taken into account when distributing shifts	No of children				Total
	None	Less than 3	3-6	More than 7	
Disagree Count % within Social conditions and existence of children are taken into account when distributing shifts	75 33.6%	83 37.2%	59 26.5%	6 2.7%	223 100.0%
Neutral Count % within Social conditions and existence of children are taken into account when distributing shifts	44 61.1%	15 20.8%	11 15.3%	2 2.8%	72 100.0%
Agree Count % within Social conditions and existence of children are taken into account when distributing shifts	54 47.0%	35 30.4%	24 20.9%	2 1.7%	115 100.0%
Total Count % within Social conditions and existence of children are taken into account when distributing shifts	173 42.2%	133 32.4%	94 22.9%	10 2.4%	410 100.0%

**Table 83: H4.5 Statistical analysis by Marital status**

Distribution of shifts takes into account residence of nurses of transportation issues		Marital status				Total
		Single	Married	Divorced	Widow/er	
Disagree	Count	47	184	1	1	233
	% within Distribution of shifts takes into account residence of nurses of transportation issues	20.2%	79.0%	.4%	.4%	100.0%
Neutral	Count	12	27	0	0	39
	% within Distribution of shifts takes into account residence of nurses of transportation issues	30.8%	69.2%	.0%	.0%	100.0%
Agree	Count	70	65	1	1	137
	% within Distribution of shifts takes into account residence of nurses of transportation issues	51.1%	47.4%	.7%	.7%	100.0%
Total	Count	129	276	2	2	409
	% within Distribution of shifts takes into account residence of nurses of transportation issues	31.5%	67.5%	.5%	.5%	100.0%

**Table 84: H4.5 Statistical analysis by Presence of Children**

Distribution of shifts takes into account residence of nurses of transportation issues		No. of children				Total
		None	Less than 3	3-6	More than 7	
Disagree	Count	73	86	69	6	234
	% within Distribution of shifts takes into account residence of nurses of transportation issues	31.2%	36.8%	29.5%	2.6%	100.0%
Neutral	Count	16	12	10	1	39
	% within Distribution of shifts takes into account residence of nurses of transportation issues	41.0%	30.8%	25.6%	2.6%	100.0%
Agree	Count	84	35	15	3	137
	% within Distribution of shifts takes into account residence of nurses of transportation issues	61.3%	25.5%	10.9%	2.2%	100.0%
Total	Count	173	133	94	10	410
	% within Distribution of shifts takes into account residence of nurses of transportation issues	42.2%	32.4%	22.9%	2.4%	100.0%

**Table 88: H5.1 Statistical analysis by Break Intervals**

Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration	Break intervals allowed during every shift			Total
	Less than 15 minutes	16-30 minutes	More than 30 minutes	
Disagree Count % within Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration	40 55.6%	28 38.9%	4 5.6%	72 100.0%
Neutral Count % within Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration	28 45.9%	29 47.5%	4 6.6%	61 100.0%
Agree Count % within Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration	169 64.8%	79 30.3%	13 5.0%	261 100.0%
Total Count % within Odds of having accidents and personal injuries increase as a result of shift work system and the associated fatigue and loss of concentration	237 60.2%	136 34.5%	21 5.3%	394 100.0%

**Table 150: List of targeted hospitals**

Governorate	Governmental Hospitals	Private Hospitals
Hebron	Queen Alya Hospital	Al-Ahli Hospital
Bethlehem	Beit Jala Hospital	French Hospital
Ramallah	Al-Rea'ya Hospital	Ramallah Hospital
Nablus	Specialized Arabic Hospital	Al-Watani Hospital
Qalqilya	Darwish Nazzal Hospital	UN Hospital
Tulkarem	Thabet Thabet Hospital	Al-Zakah Hospital
Jenin	Jenin Hospital	Al-Razi Hospital

جامعة النجاح الوطنية

كلية الدراسات العليا

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إعداد

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إشراف

د. يحيى صالح

قدمت هذه الأطروحة استكمالاً لمتطلبات الحصول على درجة الماجستير في الإدارة الهندسية  
بكلية الدراسات العليا في جامعة النجاح الوطنية، في نابلس - فلسطين.

2014

ب

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الملخص

مع تزايد عدد السكان في العالم بشكل عام وفي فلسطين بشكل خاص، فقد ظهرت الحاجة إلى تقديم خدمات طبية لهم والعمل على رفع مستواها وتحسينها، ومن أهم العوامل التي تضمن تقديم هذه الخدمات بمستوى عال هو تقديمها على مدار الساعة، وحتى تتمكن الجهات المسؤولة من ذلك فقد تم اعتماد العمل في نظام الورديات، وكان من أبرز المشاكل التي واجهت هذا النظام معاناة العاملين في هذا القطاع من مشاكل نفسية، اجتماعية وصحية، بالإضافة إلى حدوث أخطاء طبية وتعرضهم إلى حوادث أثناء تأدية عملهم. تم تسليط الضوء في هذه الدراسة على المشاكل التي يسببها العمل في ورديات للمرضين العاملين في المستشفيات الفلسطينية العامة والخاصة، بالإضافة إلى مناقشة وجود معايير يتم اختيار المرشحين العاملين في نظام الورديات وفقها، كما تطرقت الدراسة إلى مشاكل النوم والأرق التي يسببها العمل في ورديات، وتم تخصيص جزء من الدراسة للبحث في العوامل التي تتحكم بحجم ضغط العمل بين الورديات المختلفة، أما الجزء الأخير من الدراسة فقد ناقش رضى الموظفين ماديا ومعنويا.

أظهرت النتائج معاناة المرشحين العاملين بنظام الورديات من مشاكل صحية قد تكون أمراض مزمنة أو تعرضهم إلى انتكاسات صحية متلاحقة، أما المشاكل النفسية والاجتماعية فقد برزت بكثرة لديهم حيث يعانون من عزلة دائمة وضعف في العلاقات الاجتماعية، كما أظهرت النتائج عدم وجود معايير يتم اختيار المرشحين العاملين في ورديات على أساسها وعند توزيع الورديات فيما بينهم. تخلل الدراسة تحليل لكل المشاكل السابقة من خلال عقد مقارنة بين

الممرضين العاملين في ورديات والممرضين الذين يعملون في وردية واحدة. كما تم تحليل هذه المشاكل وفقا للعديد من المتغيرات الديمغرافية للممرضين كالعمر والجنس وغيرها.