

MASTER'S THESIS

Effects of Night Shift Schedules on Nurses Working in a Private Hospital in South Africa

by

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ABSTRACT

The research was conducted in two private hospitals in South Africa. The main domain of this research is to identify effects of night shift schedules on health and psychosocial aspects of nurses working in private hospitals. The aim is to evaluate the extent of physiological and psychosocial hazards imposed on nurses by shift-work. Presently most of South African nurses, working in hospitals are assigned to work a 12-hour shift, be it day or night shift. The assumption is that ergonomically designed shift schedules will reduce the effects of exposure to long hours of night shift.

The two hospitals were targeted to gather more organizational information regarding night shift because they have similar administrative processes. Two groups of nurses were involved in the study, those working on day shift and those on night shift. Day shift nurses were included as a group that is also assigned to work on night shift when their turn comes, working as rotational staff for a certain period. Thirty-eight nurses participated as respondents to a questionnaire and 26 nurses participated as a focus group.

The results of this study reveal that night shift cause psychosocial strain and physiological strain to nurses, especially those working a quick rotation. Nurses expressed more complaints about night shift as compared to day shift. Few nurses prefer to work on the night shift. The majority of those prefer night shift due to social problems such as transport.

Key words: Shift schedules, Night shift, Circadian rhythms

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CHAPTER 1

1. Introduction

Shift-work is a reality for about 25% of North America working population. In Sweden 8% have fixed hours outside the normal range, and 27% have irregular working hours, 4% work on shift schedules. The proportion of all workers who work night shift or irregular working hours mainly scheduled at night has more than doubled over the past 15 years. In several countries, a 12-hour shift system has been introduced and new provisions have been adopted. The changes were based on legislation and collective bargaining. A trend towards longer shifts of 12 hours has also been adopted by these countries (Åkerstedt, 1996).

Health service is one of the industries that provide a continuous service around the clock, for the benefit of all citizens in any country. Health service personnel is responsible for provision of health care through application of medical science knowledge, skill and expertise in meeting the health needs of all people within each country. It is therefore, expected that a healthy and psychologically balanced workforce provides health care. South African nurses provide health services in hospitals, clinics, and other health centres in meeting health needs of people.

Health care providers are bound to work shift-work as a health need for a number of people in all countries. Nurses as health care providers are obliged to work during the day and during the night to cater for the needs of the sick people. This can only be possible if nurses work during the 24 hours of the day. For most nurses changes that are inherent to night shift are unwelcome imposition on a normal life, yet one they have no control over. Night shift has physical, psychological and social effects on the life of an individual including nurses. The long hours that they work interfere with their health and their safety is compromised. Night work can even be worse for female nurses who also have family responsibilities such as pregnancy and child rearing. Studies have shown that shift-work can have negative impact on job performance, sleep, physical and emotional health, social life, family life, drug use and level of job-related stress. For nurses these negative effects have consequences not just for the individual, but also for the workplace, as decreased alertness and reduced job performance could endanger human lives (Brown-DeGagne & Eskes, 1998).

1. 1 Background

The focus of this study is directed towards consideration of human factors in the design of night shift schedules for the nurses. The assumption is that ergonomically designed shift schedules will assist in the reduction of physiological and psychosocial hazards in the workplace.

The study was conducted in two private hospitals [Hospital - 1 (H1) and Hospital – 2 (H2)].The two hospitals are located in the city of Pietermaritzburg, in KwaZulu – Natal,

South Africa. These hospitals (H1 and H2) cater for the population in and around Pietermaritzburg, including neighbouring cities. The major study involved one hospital (H1) whereby nursing personnel were required to respond to a questionnaire directed to the nurses working night and day shifts. Hospital – 2 was included to explore further the macroergonomic aspect of this research since both hospitals have similar administrative procedures. This hospital (H1) is a private hospital directed by a Board of Directors established in 1988, with 105 beds. Hospital personnel comprises of a multidisciplinary medical team, nurses with different qualifications, administration staff and housekeeping personnel. The services provided include Medical care, Surgical care, Paediatric care, Dental, Obstetrical and Gynaecological care and Operating Theatre. The nursing staff establishment comprises of 82 permanent nurses and complimented by 20 Agency nurses. For the purpose of this study, only permanent Registered Nurses (R/N), Enrolled Nurses (E/N) and Enrolled Nursing Auxilliaris (E/N/A) were included in the sample. Out of the total number of nurses, 42 nurses are on night shift. The three categories of nursing personnel represent all nurses of the hospital. The agency nursing personnel (supportive staff) also work in the two shifts, depending on the vacancy.

The nurses work in different units of the hospital, as allocated according to hospital needs and their qualifications. Nurses' duties involve fulfilling of the medical and nursing needs of all patients as they are, assigned to work on day and night shifts as per planned work schedule. Some nurses work night shift on permanent basis, a few work a rotational shift and some work night shift for a specified period per year, (usually 3 to 4 months).

In view of the above workforce and their assignment to different shift schedules within the health service, it was necessary to conduct this research to determine the impact and effects of night shift schedules on nurses. The study should be able to give direction as to what steps should be taken to protect nurses from the occupational stress caused by night shift.

1.2. The general purpose of the study

The general aim of the study is to identify the effects of night shift on nurses and to evaluate the impact of these on the health and well-being of the nurse, with the aim of designing the most suitable night shift schedules.

1.3. Objectives

To obtain basic data about shift work organization within the health service.

To identify factors which have a direct effect on the nurses' health and well-being.

To evaluate shift schedules.

To recommend ergonomically designed shift schedules based on identified problems.

1.4. Hypothesis

Night shift schedules expose nurses to physiological problems and to psychosocial hazards in the work place.

CHAPTER 2

2. Literature Review

2.1. Definition of concepts

- a. *Shift* refers to hours of the day in which a worker or a group of workers is scheduled to be in the workplace (Kogi, 2001).

Shift work definition varies, from country to country. The US Bureau of Labour Statistics defines people as being on shift work if they do not start work between 07:00 to 09:00 hrs (Konż, 1990). Kogi, (2001) defines shift work as working other than daytime hours, and night work means work performed after 18:00 and before 06:00 hrs. the next day.

- b. *Night work* in terms of section 17 (1) of the Basic Conditions of Employment Act, 1977, night work means work performed after 18:00 and before 06:00 the next day (www.workinfo.com/Manual/Retrenchment/bceal1998.htm 22/01/2003).

- c. *Shift Organisation* refers to the allocation and arrangement of shifts to keep the production going for 24 hours (Kroemer, 1992).

- d. *Shift schedules* refer to the assignment of workers to a particular shift and time allocated to each of the shift pattern (Pierce *et .al*, 1989).

- e. *Moonlighting* is the term used to refer to the practise of accepting employment with another employer, for the employee's own account, outside of his or her normal working hours that forms part of the employment contract with the primary employer (Geyer, 2001).

- f. *Private hospital* refers to health institutions/facilities that belong to a variety of autonomous private health providers with minimal intervention by the state (Van Rensburg *et, al*. 1994).

- g. *Category of nurses* In terms of the South African Nursing Act, Act 50 of 1978, nurses are categorized according to Registered nurses (a register is kept for the trained nurses), Enrolled nurses and Enrolled Nursing Auxiliaries (A roll is kept for this category of nurses).

- h. *Ergonomics* is the study of work (Latin: ergo = work, nomos = rules, laws). More specifically ergonomics is the science of designing the job to fit the worker, rather than physically forcing the worker's body to fit the job. Ergonomics draws a number of scientific disciplines, including physiology, anthropometry, industrial hygiene, and kinesiology (Konż, 1990).

According to Pheasant, (1991) ergonomics is the scientific study of human work. Ergonomics involves the application of scientific information concerning human beings to the design of objects, systems and environments for human use.

- i. *Circadian rhythm* the word comes from Latin “Circa dies” which means “about a day”. Circadian rhythms are partly driven by the internal body clock and partly synchronized to the external world by cues known as *zeitgebers* (German: *zeit*, time; *Geber*, giver (Pheasant, 1991).
- j. *Biological rhythm* refers to any cyclic change in the level of a measure or chemical in the body. Biological rhythms are described physiological processes that take place within the human body (Rodgers *et. al.* 1986).
- k. *Fatigue* is the feeling of abnormal tiredness, lethargy, loss of drive. The word ‘fatigue’ is a term applied to a wide diversity of conditions. Fatigue merges into a number of others, which are equally difficult to define such as stress, boredom, depression etc. These conditions are subjective, behavioural and physiological. The general state of bodily exhaustion which, results from prolonged heavy work, is the depletion of the body’s energy reserves. Fatigue, which results from most occupational tasks, is due to more subtle psychophysiological processes (Pheasant, 1991).
- l. *Temporary nurses* for the purpose of this study, temporary nurses are those nurses who provide health care in the hospitals through the administration of the Agencies. In terms

of the Basic Conditions of Employment Act, No. 75 of 1997, temporary employment service means any person who, for reward performs work, provides services and remunerated by the temporary employment service.

2.2. Literature

2.2.1. Reasons for Shift work

In the Digest for Conditions of Work, (1990) ILO states the reasons for working time arrangements. The underlying causes of changes in the working time practices were, the renewed interests in flexibility for working time, derives from both social and economic change. Generally, the modern workforce prefers increased opportunities for choices about timing of work. Workers as consumers may prefer that services be available for longer periods. Young workers, the workers with family responsibilities and older workers may have different concerns, but all have an interest in some forms of working time flexibility. These can be educational leave, shorter or more flexible hours or phase retirement. They also may have new needs for protection, as in the case of many part-time workers. At the same time, strong competitive pressures have pushed employers to find ways to operate their enterprises for longer periods or better adjustments to seasonal or other fluctuations. Several developments regarding work and workforce, concern shift and night work. In the health service, medical service is required for a continuous period,

which extends to 24 hours. In the modern industrial society, reasons for shift-work, is found to be similar in different countries (Kogi, 2001).

The earlier reasons for extending hours beyond the day - time shift were, based on a need for continued service or continued processes. Examples of these services are Police, Fire, security, Military personnel, Hospital personnel. These services are often standby, with routine duties being done until an emergency need for action arises. In some services, it used to be possible to catch "40 wink" between calls, but this is seldom the case anymore. Production demands could be met with overtime around the clock. Some operations are cheaper during the night, such as computer programs, tele-communication systems. Social expectations, is one of the reasons for shift-work for access of certain services around the clock. It is a general expectation that night workers perform according to the same standards as day workers in those tasks that are done on both shifts. In other instances, the need for shift-work is determined by the time of delivery of the industry's service. Table 1 is showing some industries with percentage of shift-workers (Rogers *et al*, 1986).

Table: 1 Percent of Total Workers in Shift Work by Industry Type United States, 1975

Industry type	Total workers in thousands	Percent shift workers
Hospital	1,117	36.9
Education	1,115	17.0
Transport	763	39.6
Food	593	42.7
Health	572	29.9
Postal	277	45.8
Other professional services	246	17.3
Printing and Publishing	327	28.8
Chemical and Allied Products	199	19.7
Welfare	221	21.8

2.2.2. Description of Shift-work

Shift-work schedule could be organized in a variety of ways. A shift system may include day work plus one or more shifts worked outside these normal day-work hours. Thus, the number of shifts per day may be two, three or more. These shifts may be shorter or longer, or the same as day-work hours. Major problems of shift systems arise from the extension of business hours that result in phase displacement of the sleep period and therefore substantial changes in the daily life of shift-workers. The number of shifts per day may be two or three in a typical shift system. Most discontinuous systems have two shifts; either morning, afternoon shifts, or day and night shifts. Two twelve- hour shifts are often seen, whereas the two shifts may differ in length, for example, comprising an 8-

hour shift and a 16-hour shift. Typical three shift systems have three 8-hour shifts, but may vary from place to place. The compressed work week offered by 12-hour systems allows larger blocks of time-off for family and leisure whereas a counter argument is that longer work shifts, especially at night, may result in a greater risk to safety because of fatigue combined with disturbance to alertness and performance rhythms. Folkard, (1990) has overviewed the issues around extended work-shifts and their links to excessive fatigue (Kogi, 2001; Smith *et. al.*, 1996).

Sergean, (1971), state that the widespread use of three shift rotation in industry has developed since the 1920's and represents about, a third of the shift work system in use today. Rotational shift-work covers a variety of work schedules and implies that shifts rotate or change according to a set schedule. These shifts can be either continuous, semi - continuous or running 2 or three shifts per day with or without weekends. Workers take turns working on all shifts that are part of a particular system. Night workers might work in the evening, in the middle of the night, overtime or extra long workdays. Estimates of numbers of shift workers vary with the definitions and from country to country. The Beareau of American Labour statistics reports that 5% of American adults work in the evening, 4% rotating shift -work, 4% permanent night workers with irregular schedule. Altogether 15.5 million people NIOSH Publication (www.cdc.gov/niosh 22/05/02).

2.2.3. Shift work in the Health Service

Nursing personnel are subject to psychological stress as a consequence of shift rotation, extended work schedules, and prolonged contact with irritable and depressed patients (Lewy, 1981). In addition, the nature of hospital work forces nurses to make important patient care decisions under conditions in which there is no certainty concerning events and outcomes. Nurses may manifest psychological stress by taking on extra work, showing emotional withdrawal, engaging in substance abuse, or exhibiting depression. Therefore, the nurse manager should monitor subordinates for these behaviours, confront impaired workers about declining productivity, and refer them to appropriate support groups and or medical care. Studies have shown that nurses in certain specialities, such as intensive care nursing, are at special risk of psychological stress. Intensive care units are characterised by intricate machinery, high noise level, and physical contact with blood, vomitus, incessant time pressure and infection hazards, and unpredictable emergencies (Hay and Oken 1972). To offset the effects of such stressors the nurse manager should facilitate peer support within each group of nurses by encouraging group social activities (Gillies, 1989).

Smith *et al.* (1996), state that much of the research comparing 8 and 12-hour systems has been carried out in the health services, where the best type of shift system to promote the best patient care and staff satisfaction has been the subject of debate in health-care related shift-work literature. Some studies have reported benefits following the introduction of

12-hour shifts in terms of positive attitudes about travel to work and time off duty, improved staff morale and reduced sickness. On the other hand, there have been reports of unfavourable outcomes following the introduction of the 12-hour shift. For example, reduction in quality of health care and dislike of the shift is cited as major problems (Todd *et al.* 1991; Vik and Mackay, 1982).

Makowiec-Dabrowska, *et al.* (2000), evaluated whether nurses can work in a 12-hour shift to check whether a 12-hour working system constituted an excessive physical workload and work stress for nurses. The study was conducted on 536 nurses working a 12-hour shift and 169 working in an 8-hour day shift. Their results concluded that the 12-hour system was, characterized by less significant physical workload but greater mental load. The nurses working in a 2-shift system were more tired after work, but they could spend more time on leisure activities and do house work. Their data suggested that there are no significant contradictions for nurses to work in a 2-shift system.

In Japan, the Health and Safety Association published the results of medical examinations of the country's salaried employees. This report includes the results of 600,000 employees in the health and hygiene sector. Nurses who work rotating shifts had complaints concerning fatigue and this was highest in the night- shift, followed by evening then morning shift Makino (1995). The symptoms reported by night-shift nurses include sleepiness, sadness, and difficulty concentrating, with numerous complaints about cumulated fatigue and disturbed social life (Béhar *et al.* 1999).

2.2.4. The effects of shift work on the worker

Interest in the effects of shift-work on people; have developed because many experts have blamed rotating shifts for human error connected to a number of accidents and catastrophies. Lushington and Dawson, (1997), conducted a study on the perceived social and domestic consequences of shift-work for female shift-workers (nurses). A number of women working non- standard hours have increased over the past few decades. The impact of shift-work on the lives of female workers and their partners; this has less documentation. A standard shift-work questionnaire was administered to a group of female shift-workers (nurses working a variable shift-work roster with night work component), to address this shortcoming. The female shift-workers and their partners were asked to judge the impact of shift-work on social and domestic life and the perceived impact of shift-work on psychology, social and physiological well- being of the female shift-worker. Overall, a high level of concordance was, observed between the responses of nurses and their partners. Both groups of subjects reported that shift-work had significant negative effect on social and domestic life. Specifically, shift-work was perceived to disrupt the maintenance of joint social activity, increase interpersonal conflict, reduce the quality of interpersonal relationship, and reduce child contact- time for female shift-workers with children. As well, both groups of subjects indicated that shift-work had significant negative impact on the psychological and social well – being of the female shift-worker. Their results suggested that the impact of shift-work on both

social and domestic life and the well-being of the female shift-workers is an important occupational health and safety issue.

Any occupational activity or work causes a certain amount of stress. Individuals and their environment constitute an inseparable unit. This relationship is necessary, permanent and mutual. The effects realized between this interconnection, independent of their nature, do cause changes to the environment as well as in the human organism. Changes occurring in the human organism may be significant from a biological point of view. The reduction of such changes to a minimum requires a continuous activity of adaptive mechanisms. It should be emphasized however, that whether it is the individual who influences the environment or the environment, which produces effects on the organism, in each case it is the human organism that suffers because of stress (Haslegrave *et. al*, 1990).

The causes of stress produced by working conditions may emanate from the environment, often qualified by standards. These effects caused by unfavourable social conditions that may prevail in the workplace are mostly within the control of management. Examples of these are work disorganization, unequal workloads, inadequate professional skills, low wages or salaries compared to workload and job demands. The stress factors associated with tasks are, to a certain extent, limited by labour safety regulations, the contract of labour and the prescriptions of work norms. These can be regular overtime, increased pace of work, heavy physical work, monotony, responsibility of own physical health,

responsibility of others' physical health, frequent adaptation to others, frequent dangerous situations (Haslegraves *et. al*, 1990).

2.2.5. The Ergonomical Aspect of Shift-work

a. Circadian Rhythm

Åkerstedt, (1996) state that the circadian rhythm is determined by the nucleus suprachiasmaticus in the hypothalamus. This structure regulates the physiology and psychology functions of the body such as body temperature. Body temperature is often used as an indicator for circadian rhythms, reaching its maximum at 17:00hrs and its minimum at 05:00hrs. The basic principle underlying the rhythm variations is catabolism (the breaking down and release of energy) and readiness for action during the day, and anabolism (regeneration) and rest during the night.

According to Pheasant, (1991), the word circadian comes from the Latin “circa dies” which means “about a day”. Circadian rhythms are partly driven by the internal “body clocks” and partly synchronized to the external world by cues known as zeitgebers (German: *Ziet*, time; *Geber*, giver). These rhythms are coordinated to allow for high activity during the day and low activity at night. Normally the body uses cues from its processes and from the environment such as clock time, social activities, the light/dark cycle, and meal times to keep the various rhythms on track. The shift-worker's temperature rhythm and other body rhythms get out of phase with the persons activity

pattern. This disorientation can lead to feeling of fatigue and disorientation. “Jet lag” is a term, often used to describe these feelings (www.ca/oshanwers/work_schedules/shiftwrk.html) 02/05/01.

The circadian rhythm is a major body rhythm with regular ‘ups and downs’ in the 24-hour day. Many systems in the body are very active at certain times of the day and not active at all in other times of the day. The least activity usually occurs in the middle of the night when most people are asleep. The majority of people feel most active and alert between 16:00 -18:00 hrs and sleepest at 04:00 – 06:00. There are personal differences in the circadian rhythms. People who show the peak in the body temperature in the mid-evening hours are known as “morning types” or “larks”. Those who experience their peak later in the evening and the minimum point in the morning are known as “evening” type or “owls”. On average, the normal day work is the best schedule for performance, which means it is also best for safety. “Larks” have difficulty in adjusting to night shift work and are likely to experience more sleep and digestive problems than “owls” do (Froberg, 1981 in Rodgers *et, al.*1986).

Grandgean, (1995) also state that the human organism is in its ergo tropic phase (geared to perform) in the daytime, and in its trophotropic phase (occupied with recuperation and replacement of energy) during the night. The night worker therefore approaches his work, not in the mood for performance, but in the relaxed phase of his cycle. Ergonomics is therefore faced with the problem of planning work schedules in such a way that shift-work does as little harm as possible to health and social life. Rodgers *et al.* (1986), describes the physiological processes that take place within the human body as biological rhythms. Biological rhythm refers to any cyclic change in the level of a

measure or chemical in the body. Adrenal corticoids or thyroid hormone, are examples of hormones that can cause changes in the body. Circadian rhythm (within a day) (Halberg, 1959) and ultradian rhythm (within a few hours) (Lavie, 1982) are of importance in ergonomists since there is evidence that human performance can vary with the time of the day or within hours. These rhythms have an influence on the design of hours of work, especially the choice of shift schedules, and for determination of appropriate work and rest schedules.

Below is a list of circadian bodily functions that increase by day and decrease by night.

- (i) Body temperature
- (ii) Heart rate
- (iii) Blood pressure
- (iv) Respiratory volume
- (v) Adrenaline production
- (vi) Excretion of 17-Keto-steroids
- (vii) Mental abilities Flicker- fusion Frequency of eyes
- (viii) Physical capacity

Other time- keepers are changes from light to dark and vice versa, social contacts, work and knowledge of clock time. The most important function that is geared to circadian rhythm is sleep. It is said that sleep that is undisturbed either in quality or in quantity is a pre-requisite for health, well - being and efficiency (Canadian Centre for Occupational Health and Safety, 1998).

b. Physiological factors – sleep and performance

Sleep is one of the main reasons why irregular hours cause ailments and disorders. Extended waking leads to tiredness and reduced functional capacity. The effects are initially noticeable mostly if the individual is exposed for longer periods to a monotonous situation. After the first 24 hours without sleep, the functional capacity may be halved and after two sleepless days, the functional capacity is at its lowest and the risk of falling asleep is ever present. With prolonged exposure, the individual cannot manage to keep awake. Another aspect of tiredness concerns the ability to make complex decisions, which require thinking (Åkerstedt, 1996).

Ohida *et .al.* (2001) conducted a study on Night- Shift work Related Problems and work performance was examined in young female nurses in 11 hospitals in Japan. Subjects were 620 female nurses (average age: 23.9). A questionnaire consisting mainly of items concerning sleep disorders was used for the survey. The results indicated significant associations between working on night shift and the use of alcoholic beverages to help induce sleep, and between working on night shift and daytime drowsiness. Significant differences were observed between two and three shift system with regard to subjective sleep quality. Moreover, average hours of sleep were significantly associated with three related sleep items: subjective sleep quality, difficulty in getting to sleep and daytime drowsiness. Result suggested that in the Japanese shift-work system, sufficient sleep hours were needed for nurses who work night shift to ensure good quality sleep and consequently better services for patients. Recently in Japan, some fatal accidents due to

mistakes in treatment by hospital nurses have been reported. It was reported that such accidents tended to happen in the early morning. Of approximately 1,000,000 working nurses in Japan, it is estimated that 75% have night shift work. The Japanese Ministry of Labour also estimates that among jobs that require night shift work, nursing is the one that involves the largest number of female workers in Japan (personal communication with the director of women's worker division, the Ministry of Labour, Japan). Therefore, considering the importance of the health of the large number of nurses in Japan and the consequent impact on patient services the study evaluated sleep problems and self-reported work performance. The results also indicated that there was no significant association between the frequency of night shift and sleep disorders. This was attributed to age of the subjects. It is postulated that napping could be considered to resolve sleep disorders in nurses who work night shifts to some extent. This proposition warrants further investigation.

Novak *et al*, (1996), conducted group interviews on 45 intensive care nurses who worked a 12-hr. shift in a large metropolitan hospital. The purpose of this study was to identify nurse's perceptions of difficulties associated with shift-work and coping strategies used to combat them. Overall, the findings were not different from those discussed in the literature. Nurses frequently utilized white noise, telephone answering machines, and darkening shades to improve the quality and quantity of day sleep. They also used exercise and increased early shift caffeine consumption to improve night work performance. However, the major incentive for performing night work for these nurses was a high shift differential that equalled approximately 20% of their hourly salary. Most

nurses also felt that group educational interventions regarding shift-work difficulties and coping strategies would be preferred to individual counselling. The most significant finding of this study was the discovery of an extremely high incidence (95%) of automobile- related injuries and near-accidents that occurred while driving from and to the workplace, potentially posing a significant public health risk.

c. Health of the shift – worker

The disturbance of circadian rhythms can affect concentration, motivation, and reaction time, particularly at night. This combination can result in an increased risk of accidents and injury. Studies show that shift-workers' accident rates are more than day workers, the same or less. Thus, the findings do not conclusively indicate that night shift workers are more prone to accidents. There are also discrepancies with research on this issue because of the fact that working conditions are not the same on different shifts. For example, the nature of workload, the backup system available and the amount of supervision can make comparisons inaccurate. Nonetheless, lack of sleep heightens the decline in performance. When deprived of sleep the worker may not be fully aware that performance has deteriorated. Research has shown that the optimum mental performance level for workers occurs between 2 and 4 p.m., maximum general awareness is between one, and 7 p.m. Performance levels are lowest between 3:30 and 5:30 a. m. (CCOHS, 1998 www.ccohs.ca/oshanswers/work.schedules//shiftwrk.html).

Lipkin, *et al.* (1998), assessed the prevalence of chronic fatigue syndrome amongst nurses. Their findings suggested that nurses might represent a high-risk group for this illness possibly due to occupational stressors such as exposure to viruses and stressful shift-work that interferes with their biological rhythms. Shift-workers are more likely to suffer cardiovascular and digestive disorders. Shift-workers also experience headaches that are fatigue that is more frequent, stress, muscle pain, respiratory infection, and general malaise. These, in turn, result in higher rates of absenteeism, employee turnover, and higher costs associated with recruiting and training replacement employees.

Costa, (2001) indicates that women can be more vulnerable to shift-work and night-work in relation to both their more complex circadian and infradian (menstrual) hormonal rhythms and to extra demands related to family life and domestic commitments. Disorders of the menstrual cycle and reproductive system have been reported in many groups of women shift-workers. This includes disorders such as menstrual pains, abortion, interference with fetal development, premature and low birth weight. Besides, those with small children can have more difficulty in combining their irregular working schedule with additional domestic duties thus, suffering more sleep troubles and chronic fatigue than the male colleagues. This supports the view that women shift-workers should have more protection, especially during pregnancy, and it is advisable to transfer these workers to day work during the first two to three years after delivery.

Davis *et al.*, (2001) studied night shift, exposure to light at night, and risk of breast cancer. The results of the study state that exposure to light at night may increase the risk of breast

cancer. Light suppresses the normal nocturnal production of melatonin by the pineal gland, which in turn could increase the release of oestrogen by the ovaries (the latter being, a known hormonal promoter of breast cancer). Melatonin keeps oestrogen levels in check. Case patients were 813 aged 20-74 years, control group were 793. Information on sleep habits, bedroom lighting environment in the ten years before diagnosis and lifetime occupational history. The results indicated that breast cancer was increased among subjects who frequently did not sleep during the period of the night when melatonin levels are typically at their highest. The risk did not increase with interrupted sleep accompanied by turning on the light. There was an indication of increased breast cancer (OR=1.6; 95% CI= 1.0 TO 1.25), with the trend of increased risk with increasing years and with more hours worked at night. There was some indication although not statistically significant –of increased breast cancer risk among women who had brightest bedrooms. The study provided evidence that indicators of exposure to light at night may be associated with the risk of developing breast cancer (www.fhcrc.org/news/science/2001/10/16/graveyard.cancerhtml).

The number of older shift-workers is increasing in most developed countries due to general ageing of the working population. Ageing is one of the most cited factors decreasing the health of shift-workers. Together with the alarming relationship of shift-work to fatigue, performance, accidents and chronic heart disease, there is reason to believe that shift work may become a major challenge for the employer, employee and occupational health professionals. Although long-term prospective studies on ageing are few, shift-workers over 40-45 years of age seem to sleep worse after night, but not after

morning shifts. Sleepiness after successive night shifts is also decreased by age although older shift-workers' ability to resist acute sleep loss seems to be even better. The reasons for the altered sleep and wakefulness of older shift-workers believed to be related to changes in circadian rhythms, especially higher 'morningness'. Sleep needs may also decrease with age, which could explain some of the differences found in sleep length. In shift-workers, moderate physical training has been shown to increase sleep length and nighttime alertness. It has not been shown; however, that exercise would quicken the circadian adjustment to night work (Härmä, *et al.* 1999).

Bohle and Tiley (1989) have shown a clear and significant increase in self-reported psychological symptoms (such as depression, loss of self-esteem, difficulty in concentrating, etc.) in a group of nurses. Morning types were more susceptible than the evening types. Åkerstedt and Torsval (1978) showed a clear decrease in sleep disturbance, mood disorders, gastrointestinal complaints and sickness absence in a group of steelworkers who were transferred from shift work to day work. Frees and Semmer (1986) found a significant excess in psychological and gastrointestinal symptoms in both shift workers and former shift workers (who left for reasons of ill health) compared with day workers. The poorly adapted night worker suffers from a potentially progressive state of chronic fatigue, which may be manifest in episodes of irritability, loss of drive, depression, loss of appetite, constipation and other disturbances (Pheasant 1991).

d. Safety

Pheasant, (1991) states that the likelihood of error increases when the operator is under abnormal pressure of work, or when the working capacity is reduced because of fatigue. The accidents at Chernobyl and Three Mile Island occurred, around 01:00hrs and the Bhopal disaster also occurred during the hours of night shift. Further explanation is that time of the day may be regarded as a contributory factor which reduces the individual's ability to cope with abnormal circumstances as they arise. Working at night makes it difficult to get enough sleep. Brain and body functions slow down during the nighttime and early morning hours. The combination of sleep loss and working at the body's low point can cause excessive fatigue and sleepiness. This makes more difficult to perform well, which increases the risk of accidents (Rosa & Colligan, 1998, www.cdc.gov/niosh). In the Democratic Nursing Organisation of S.A. Nursing Update (2001): Roger and Colligan in NIOSH Publication (1977) state that shift-workers often develop problems, which do not affect permanent day workers. These problems often develop because the body has an internal clock (the circadian rhythms) that determine the core body temperature, alertness, cardiovascular system digestion and other systems in the body. In the normal day work, night sleep situation, people work when the circadian rhythm is high and sleep when it is low. On average, this schedule is best for performance, which means it is also best for safety. This means that shift-workers do not get enough quality sleep over long periods. It is possible that because shift-workers tend to be tired at work, they are more prone to make more serious accidents than day workers do.

Rodgers *et al.* (1986), explains the error rate according to time of the day. The classic study of error rates by time of day was conducted in Sweden gasworks Bjerner, Holm,

and Swensson, (1995). The number of errors made in over 175,000 recordings from 1921-1931, primarily between three men, was plotted against the time of the day. The highest number of errors occurred between 03:00 hrs within a second, lower peak occurring at 15:00 hrs. All three operators showed similar peaks in errors in the 01:00 to 04:00 a.m. periods. All the studies conducted under three continuous 3- shift schedules. In another study of the response time of tele-printer switchboard operators at different times of the day, a significant lengthening of the response time was noted in the early morning hours.

e. Employee quality of life

Koller, (1996), states that shift-work and night work have implications for the entire living sphere of mankind, thus health hazards and stresses of work itself, as well as intervening factors from outside the working life may influence and impair the state of health. There is an agreement that shift-workers are a population at risk, this is due to the fact that, they are exposed to psychobiological, desynchronisation and reduced coping associated with shift-work. (Folkard *et. al.* 1985; Costa *et. al.*1989; ILO. 1986; 1990; Rutenfranz, 1982), describe the combined effects of shift-work, the extent of disruptions in circadian rhythms. They also state that these effects are associated with phase shifting in sleep and wakefulness cycles, and cause interferences with daily routine at work and in

family and social life. Studies have documented higher rates of divorce and suicide, as well as increased use of alcohol and drugs on the part of shift-workers. Frustration, low morale, and diminished job satisfaction are also common among shift-workers (Kogi, 1996).

CHAPTER 3

3. Methods and Procedures

3.1 Subjects

The participants of this study consisted of 38 permanent nurses who were respondents to a questionnaire, all working in a private hospital. This group comprised of 36 female nurses and 2 male nurses. Twenty-four nurses worked on day shift and 14 nurses worked on night shift. Day shift nurses formed part of the subjects since they rotate to work in both shifts, from time to time or when their turn comes to work on night shift. The subjects work in all units of hospital-1, which are Intensive Care Unit (ICU), Operating Theatre (OT), Medical Unit, Surgical Unit, Obstetrical Unit, Paediatric Unit, Casualty Unit, and other smaller units attached to the main units. Only day nurses working in OT participated in the study, since theatre operates during the day and closed at night.

3.2 Observations

Observation of work processes and work environment conducted in different shifts and units of hospital-1, over a period of 1 week. The researcher was assigned to work as a voluntary worker in H1 to observe, changing over of nurses from one shift to another, work organization, available personnel resources, and programme of the shift system including Nursing Agency personnel, breaks, and facilities.

3.3 Interview

Interview questions were administered to the Hospital Nursing Managers of H1 and H2 in their respective hospital offices. The main aim was to make a comparison with the data from the hospitals with a similar structure. The data gathered should be able to give more information related to arrangement of shift schedules in the private sector (Schedules in appendix 3) The interview questionnaire consisted of similar questions related to the macroergonomic aspect of shift work for nurses working in the two hospitals. The interviews were, relayed verbally to two Nursing Managers within 2 hours respectively. Interview questionnaire attached as Appendix 1.

Another interview was conducted with one of the South African Nurses' Trade Union Official to gather information regarding complaints related to shift work.

3.4 Questionnaire

A questionnaire comprising of 25 questions administered to permanent nurses working in different units and shifts of H1 as shown in Appendix. The temporary nurses were not included in this study since they rotate in different hospitals as assigned by the Nursing Agency. The questionnaire contained questions relating to experience, attitude to the different shifts schedules, sleeping patterns, health issues and social interaction during night shift. Subjects were to fill in the questionnaires during their convenient time within a period of 5 days. Format attached as appendix 4.

3.5 Focus group

The focus group comprised of 6 nurses from H1 and 20 nurses from H2. The nurses from H2 were in schedules of the 12 -hour night shift of 7 nights on and 7 nights off, a slow rotating shift of 3 nights on and 4 nights off. The nurses working in the Intensive Care Unit (ICU) worked on fast rotating shifts that involved moving from night shift- to an off duty then to a day shift in a rotational cycle.

The focus group was formed to gather information from different groups of nurses without the limitation of the structured responses. The nurses were divided into 5 groups whereby discussions were conducted on three separate nights in the two hospitals. The researcher facilitated the discussions and the nurses were allowed an hour to discuss night shift issues as outlined in the format (appendix 2).

3.6 Checklist

An observation of the working environment was conducted in H1 to assess ergonomical conditions of the workstations, rest rooms, cafeteria/lunch room, toilets and bathrooms, safety and security. The main domains of the checklist were cleanliness, ventilation, lighting and furniture. Checklist attached as appendix 5.

CHAPTER 4

4. RESULTS

4.1 Management Interview Results

Macroergonomics – The organizational structure and administrative processes of hospital-1 and hospital-2 is similar, although their working processes are not identical. Ownership is by two different Boards with different Administrators. The bed state of both hospitals is 105 beds.

4.1.1. Number of nurses

The distributions of nursing personnel amongst the various categories in the hospitals are shown in Table 3 and 4. More registered nurses worked on a permanent basis in both hospitals. Unlike H1, staffing in H2 did not make use of agency nurses.

Table: 2 the distribution of nursing personnel amongst various categories in Hospital – 1

Category	Permanent Nurses	Temporary (Agency Nurses)
Registered nurses	30	8
Enrolled Nurses	28	4
Enrolled Nursing Auxiliary	24	8
Total	82	20

Table: 3 the distribution of nursing personnel amongst various categories in Hospital – 2

Nursing Category	Permanent
Registered Nurses	77
Enrolled Nurses	20
Enrolled Nursing Auxiliary nurses	23
Total	102

4.1.2. Target Units

The Nursing Managers are responsible for administering the allocation and placement of nurses to all units of the hospital. There is continuous communication between nursing managers and unit Managers regarding staffing and scheduling. The following units comprise of different categories of nursing personnel, who work on day or night shift in both hospitals.

- Medical
- Surgical (includes the Orthopaedic patients) Units
- Intensive Care Unit
- Obstetrical Unit
- Operating Theatre (closes at night except during emergencies).
- Casualty
- Paediatric unit

4.1.3. Shift schedules

Nurses in hospital 1 work for a total of 154 hours on night shift and 160 hours on day shift during a four-week period, whilst nurses in hospital 2 work for 168 hours in 4 weeks. The night shift schedule patterns for hospital 1 and 2 are shown in appendix 3.

In both hospitals, requests from nursing staff are considered according to the peculiar needs of nurses. Working on a permanent night shift is normally based on the nurse's request and this may be due to a number of social reasons as put forward by the nurse. The plan for the shift schedules is flexible for all staff members and scheduling allows for distribution of nurses in all age groups to work either on day or on the night shift. Consideration is given to a change of working schedules for nurses who are either pregnant or suffer from certain ailments. Nursing staff can work overtime on special arrangements with management, depending on the number of resting hours during their off duty time. Particular attention is paid to the provision of resting periods for staff in both hospitals.

In hospital 1, working on a night shift is by prior arrangement between the staff and the nursing manager for a minimum period of 3 months. A maximum working load of 11 hours per shift period is allowed for overtime. Moonlighting is permitted within the hospital standards.

Working on a night shift in hospital 2 depends on the health care requirements of each unit. Shift scheduling is a flexible component of hospital administration. The administration in hospital 2 permits nurses to work overtime for a maximum of 36 hours

on the week they are off duty. There is a lot of flexi-time for all shifts. Permanent night shift depends on level of performance of the nurse and the agreement with the Hospital Company Agency. Moonlighting operates through the hospital agency to external staff but internal staff obtains permission from the Nursing Manager.

4.1.3. Policy guidelines for night shift and schedules

There is no policy document on night shift working schedules. Shift organisation in both hospitals is according to internal standards of each institution. Unit Managers are responsible for designing shift schedules and there is some flexibility in the application of these schedules in both hospitals.

For H1 a regular pattern is the norm for all nurses to complete 40 hours per week. Nurses work on a 7 to 7 (12hr.) shift during either the day or night shift. The week is broken into two sessions. The Nursing Manager of the hospital is responsible for staffing of the units.

Regardless of the night shift schedules nurses working on this shift in H 2 work for 7 nights on and 7 nights off duty. The norm is a 42 hours working load per week.

4.1.4. Breaks

In H1, nurses working on a day shift have 30 minutes tea break in the morning, whilst lunch break is for an hour. There is also a 15 minute afternoon break at the convenience of the staff with due regard to pressure of work in the ward. Night nurses have a standard of three breaks, an hour for a meal and resting, 30 minutes break for refreshments. There is also a provision that allows a further short break at a convenient period during the shift. Slight differences exist between nurse working in H1 and H2 as regards breaks. In H2, day nurses have a one-hour lunch break and tea breaks depending on the availability of time. Night nurses have their meals in their units; the same flexibility applies as with the day shift.

4.1.5 Types of Leaves

Leave periods are arranged according to the existing policies of both institutions. Nurses receive information about the conditions that apply on employment. Nurses are entitled to vacation, sick leave, study leave, family responsibility leave, and compassionate leave. Absenteeism is uncommon. The system of reporting absenteeism is according to hospital policy, which is communicated to staff in all units. There is no written policy specifically for the hospital but there is maintenance of existing hospital standards.

4.1.6. Facilities for nurses

There is provision of the resting and dining facilities in H1, but this tea –room or restaurant is rather far from the wards or units. The restaurant is on the sixth floor of the building and nurses come from all floors of the hospital, including the ground floor. Night nurses use these facilities for tea, lunch and resting during breaks. Sometimes the restaurant (Figure2) becomes overcrowded, especially during the day. A spacious smoking area is located on the balcony, near the restaurant. A new coffee shop for staff will be opening soon. In hospital 2, the restaurant opens up to 20:00 hrs. There is no provision made for night nurses to dine and rest during the night in this hospital. Both hospitals provide nurses with lunch during the night shift.

Most of the nurses' workstations are located in close proximity to the units or cubicles where patients sleep. The workstations' structure is such that it allows for standing and sitting activities as needs arise (Figure 3 and 4). The newly renovated wards have rest rooms and bathrooms as shown in Figure 1. Bathrooms and toilets serve all employees and the renovated units have shower facilities. Both hospitals have not employed any nurse with a disability, even though facilities exist in some areas for nurses with physical disabilities. The working environment is clean with good ventilation and good lighting. The construction and renovations cause slight disturbance and minimal environmental pollution of the affected areas. Some of the facilities provided for nurses are in the Figures below.

Figure 1 showing a restroom in one of the wards in hospital 1



Figure 1 shows a rest room in one of the units that have a renovated structure. This rest room has a resting area as shown in figure 1, a bathroom, and a toilet, built inside this area. Presently, nurses working on day shift utilize the rest room. It is still not possible for the few nurses working in this unit at night to use it.

Figure 2 a restaurant in hospital 1



Figure 2 shows the restaurant that is on the sixth floor of the hospital building. Day and Night nurses from all the wards eat their food in this restaurant. Lunch provided to night nurses at no charge. The restaurant opens from 21:00hrs to 01:00hrs.

Figure 3 A nurses station for standing activities



Figure 3 shows one of the nurses' workstation situated in the middle of the ward. This area is the central point for communication and office interaction of nurses of different sections of this big ward. Nurses do certain tasks such as sorting of patients' treatments whilst they are standing on this side of the workstation.

Figure 4 A nurses' workstation for sitting and standing activities



Figure 4 shows the workstation used by the ward clerk (usually a nurse). The desk is not an adjustable type; the nurse does her tasks in a sitting position and only stands to perform those tasks that allow a standing position such as answering of the phone.

Common complaints from nurses

There is an acute shortage of staff in H1. The hospital does not have an Occupational Health Service even though there is an awareness of the prevalence of occupational

injuries and other illnesses. Common occupational injuries include Muscular-Skeletal Disorders and Needle Stick Injuries (NSI). One example is a prick by a used injection needle, classified as an NSI. In 2001 and 2002, there were 5 and 14 NSI respectively.

In H2, nurses complained of isolation from the rest of the hospital staff. Generally, even though nurses do not like night shift, there has been very little complaints to the authorities. Occupational injuries are not common but needle stick injuries occur. Nurses do sustain Muscular-Skeletal Disorders from lifting patients. Statistics are not available from management to support information regarding injuries and hospital acquired diseases. The company is in the process of introducing a programme for occupational health and safety. Nurses receive training from the Physical Therapist to prevent Muscular-Skeletal Disorders.

4.1.7. Customer satisfaction with regard to night service

H1- Customers have not forwarded complaints to management.

H2- Patients who sleep in other units/wards complain of noise at night from nurses, waking up early and during late hours for medication. Sometimes all depends on the personality of the person or a particular patient; some do not understand hospital routine.

4.1.8. Strengths and weakness

Both hospitals have good communication system with employees. Direct communication between day and night nurses occurs during handing over, when the other group is

coming at work and the other going off. Day and night nurses make use of tools such as communication book for continuity of service, on daily basis. Permanent nurses know their work and processes of hospitals well. There is minimal turnover of nurses in both hospitals with low absenteeism rate of nurses.

Staffing of units is still a problem, especially when there is a sick nurse from any of the units. Permanent nursing staff is not adequate and it becomes difficult to obtain the supporting staff without arrangement in good time.

4.2. The Focus Group Results

The focus Group comprised of a group of 26 permanent and temporal (rotating) female nurses working on night shift, from Hospital – 1 (H1) and Hospital 2 (H2). Six nurses were from H1 and 20 nurses from H2. The group comprised of nurses working in Casualty, Surgical wards, Medical wards, Obstetrical wards, Paediatric wards and Intensive Care Units (ICU).

4.2.1. 12hr Shift schedule

Nurses were dissatisfied with the long hours worked in both hospitals. Some could not afford to change from this shift as they have transport problems. The majority of nurses

from H1 were satisfied with the pattern of their shift schedules, stating that it is better since the shift is broken into two in a week. The nurses from H2 were of different opinion. About 60% of nurses stated that their shift is too long, tiring and causing physiological and mental strain. They rather prefer a broken shift schedule (3 nights on and 4 nights off alternating to cover 40 hours per week). Those who do permanent night shift are satisfied with the 7 nights on duty and 7 nights off duty. Some nurses stating that the shift pattern fits into their lifestyle. Nurses who work rotational shift prefer shorter stretches of 2 to 3 nights at work. Nurses working in the ICU in H2 experience discomfort from a rapid change of shifts, from rapid rotation of their shifts (night shift to off then day shift) in a continuous cycle.

4.2.2. Breaks

Nurses have 1-hour break in hospital - 1. Nurses in the ICU do not take rest breaks; they only have their lunch within the ward. They state that they are only two in each night, making it impossible for them to leave one person to attend to patients under intensive care. Some nights are very busy. Night nurses have free lunch from the hospital restaurant, served from 21:00 to 01.00 hours. There is no lounge for resting except in some units. The hospital is under a process of renovations to bring change to structure of facilities.

Nurses in Hospital - 2 are officially entitled to 1-hour break but they do not take this break. Rest during lunch break depends on the tempo of the ward in each night and nurses can hardly have a break. Nurses cannot leave the working area since they are few

in each unit. Lunch is provided by the hospital to all nurses to be eaten within close proximity of the unit. There is no common restaurant or canteen for night nurses.

4.2.3. Shift preference

Night shift preference

In both hospitals, nurses preferring night shift had similar reasons for their choice.

Reasons are as follows: -

Nurses find that it is safer to commute in the evening to go to work than commuting from work to their homes. Most of the nurses who travel by public transport experience problems, especially with the evening shift where they feel that their safety is threatened. Others specify that night shift fits in better with the home responsibilities. Some nurses are comfortable with night shift and they organize in advance to fit into night shift schedule. There are those who say night allowance adds onto their income and able to make independent decisions. Some say that there are no early mornings, preferring to get up in the afternoon.

4.2.4. Day shift preference

About 90% of the group state that night shift is generally uncomfortable. They sleep well during the night, whereas it is difficult to sleep during the day after night work. Some nurses have problems getting child minders at night. Nurses feel less tiredness on day shift since there is more staff during the day shift. There is more social involvement spends more time with family and the shift is less stressful.

4.2.5. Work demand on night shift

Nurses feel that both day and night shift have long hours of work, this is because both shifts are 12 hours. Nurses in the two hospitals find that night shift demand is heavier since there are fewer nurses to carry the load. Some units are busy at night and day -time. Some nurses find that night shift is more strenuous, they get drowsy towards morning, and the body gets tired. However, for some there is less distraction or less interruptions for routine work, working pace is slower, few procedures to do, better team work.

4.2.6. Night shift problems

- Nurses in H1 and H2 attribute problems to the following factors:
- Inefficiency of support system (flexi-time nurses) failing to give adequate support.
- Sometimes pressure of work is too high during crisis and support system is unavailable, this leads to exhaustion.
- There is constant change over of Flexi-time staff.

- Nurses use their first day of their night off to sleep, covering for sleep debt. H2 rotational nurses have difficulty in adjusting to rapid change of shifts.
- Nurses are generally unable to sleep at night when they are night off.
- It is difficult to sleep when one is too tired, too hot and the quality of sleep is poor during the day.
- Sleep period becomes short.
- Fatigue is a problem, especially in H2 where there are no breaks leading to low concentration for some, very few have no problem in this aspect.
- Nurses experience headaches and gastro intestinal problems in both hospitals.
- Social relationships affected in some ways. Nurses with husbands missed to be them. They do not attend most of social events.
- The nurses leave their children alone and are unable to supervise children with the schoolwork.
- Nurses in H2 worry about safety of their cars within the hospital premises and all worry about house breaking whilst they are at work during the night.

4.2.7. Strategies used for sleeping

- Taking naps on the first day off
- Sleeping early
- Reading

- Drinking beverages such as milk
- Use of essential oils

4.2.8. Suggestions for improvement of night shift

- Reduce the number of working hours.
- Change to 8-hour shift or 2-hour break to rest
- H2 nurses- need 1-hour break
- Both need more staff
- Better communication between day and night nurses

In hospital - 2 nurses who work in ICU have a rapid shift rotation at present. The suggestion is change of shift to 2- week rotation instead.

4.3. Trade Union Interview Results

KwaZulu Natal Provincial Office

All nurses in South Africa have a right of association with a Trade Union of their choice. Trade unions regulate the relationship between the employer and the employee. Regarding affiliation to trade unions, there was no question that was directed to the participants related to their association with any union or organization. The purpose of an interview was to do an in depth review to the subject of shift work among South African nurses. Affiliation to trade unions is a common practise in public hospitals where government controls and dominates.

4.3.1. Shift schedules

Day and night shift apply to all categories of nurses within the province. The pattern or system of shift schedules, vary from institution to institution. There is no policy as guidelines towards scheduling. Arrangement of shifts is according to institutional plan of both hospitals respectively. Common off duties include 7pm to 7 am for 7days, and same number of days off work. Another pattern is 3days on duty and 3days off duty, and other arrangements of scheduling also apply. Nurses work for 40hrs / week. Trade Unions encourage discussions between management and staff to improve relations. Managers are encouraged to take into consideration the transport problems as forwarded by nurses since there are many cases of robbery in the country.

Contracts

Some contracts do not apply to Public Sector and apply only to Private Sector. Moonlighting – nursing personnel practise this as permitted by the original employer. The employers guard against the ability of the worker to perform. Overtime depends on the need for nurses for each institution.

Remuneration/Incentive for shift work – For Public sector and Private sector, nurses receive night duty allowance.

4.3.2. Complaints and Risks that commonly affect night nurses

- Night shift is strenuous from long hours of work in a stretch of 7 days as an example, affecting nurses physiologically.
- Exposure to psychological hazards (exposure to Disciplinary Action) due to errors at work.
- Cross infection due to lack of supervision
- Newly qualified nurses experience delays in obtaining certificates from the South African Nursing Council. This delay results in delay in employment or correct placement of nurses. The result extends to frustrations since those who have undergone a bridging course remain in the Auxiliary level, and shortages in institutions. Some nurses resort to working day and night in an attempt to meet financial demands for their families.
- Night nurses often experience unfair distribution of schedules as a result they have to go on with unfavourable off duties.

4.3.3. Staffing problems

The system of employment of newly qualified nurses causes discrepancies in hospitals. The nurse should wait for a certificate before employment to an upper rank after passing an examination. As a result, nurses resort to moonlighting, working day and night without rest in an attempt to get additional salary. This is a psychosocial hazard (stress) to the life of the nurse and exposing patients to hazards.

Nursing Agencies contribute to scheduling problems by delaying information to the nurses who work under them. In this way, nurses do not get time to rest in between the permanent place of employment and the part-time employment. All this puts the nurse's

life and the patient's life at risk – Most incidents occur during the night. Work problems lead to stress and low productivity.

Basic conditions of employment form the basis for contracts and employment. To note is that sometimes there is neglect for conditions of employment and contracts between employers and employees.

Statistics for Kwa-Zulu Natal Nurses

Adapted from South African Nursing Council Statistics as on (31. 12. 1999)

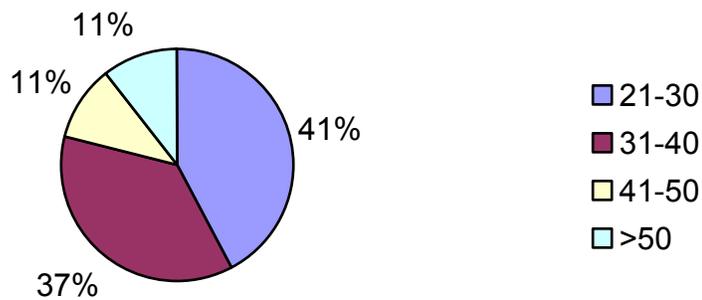
Registered Nurses and Midwives	16,933
Enrolled Nurses	8,575
Enrolled Nursing Auxiliaries	7,978
Total	33,486 Nurses

4.4. Questionnaire Results

A questionnaire was structured to explore the effects of night shift schedules on nursing personnel working in a private hospital in Pietermaritzburg. The results of the study are

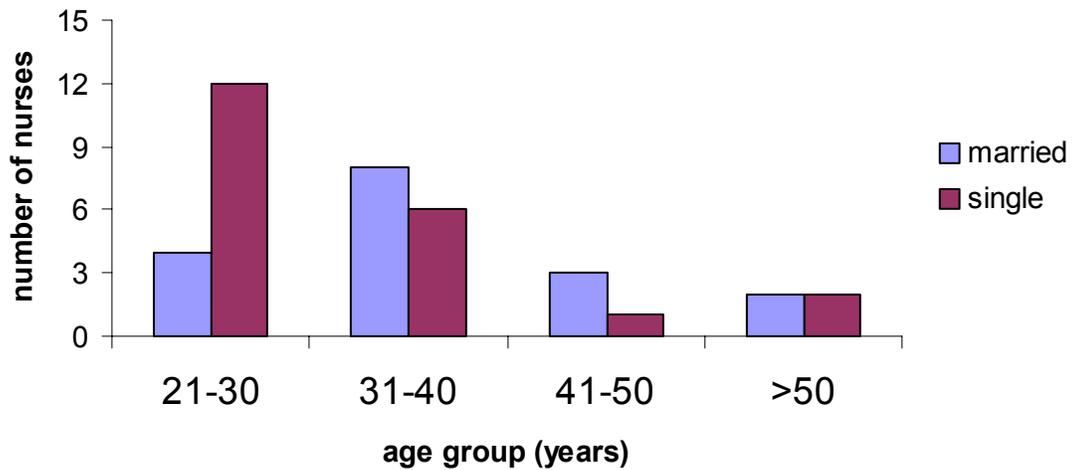
presented in the following section. It was preferable to use descriptive methods and graphics to illustrate responses of the nurses who participated in the survey. The personal data depicted in Figure 5 shows the age distribution of nurse respondents. The younger population in the age range 21 to 30 years formed a larger proportion (41%) of the workforce, followed by the 31 to 40 year group. There were two male respondents, one in the 21 to 30 year group and the other in 31-40 year group. Males formed only 5.26 % of the nurses who participated in the survey. Very few nurses in the age range 50 years and above participated in the survey.

Figure 5 Age distribution of nurses (years)



It was desirable to have a look at the civil status of the respondents of this survey in order to be able to determine the relationships between status, age and response to work schedules. Figure6. illustrates the marital status of the respondents in relation to their age groups. The largest number of nurse respondents were single and in the in the age range 21 to 30 years.

Figure 6 Civil status of different age groups

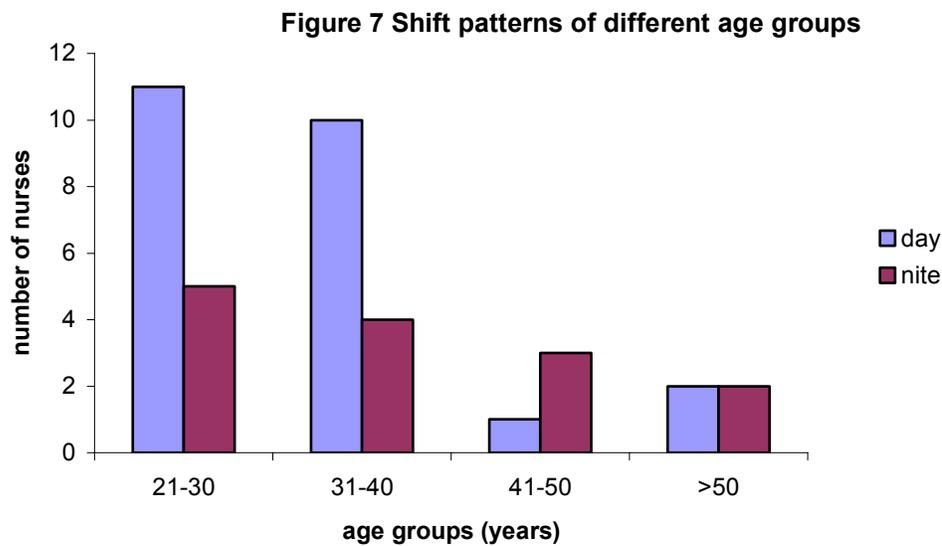


On the contrary, as age range increased to 50 there were fewer single than married respondents do. Above 50 years of age, equal proportions of married and single respondents completed the questionnaire.

Out of the total respondents, 68% worked on a day shift and 32% on night shift. A paired t-test was performed to test the difference between the two means of those who opted to work on the day or night shifts. The probability results were ($p = 0.040$) indicating that there was no significant difference between the numbers of respondents who opted to work on either shift ($p < 0.05$).

Figure 7 shows the allocation of nurses to day shift or night shift in relation to their different age groups. For the age ranges 21 to 30, 31 to 40, 41 to 50 and > 50 years there

were 46, 42, 4 and 8 % of nurses who opted to work on day shift, for the same age ranges there were 36, 29, 21 and 14 % respectively who opted to work on night shift. In general, younger nurses preferred to work on a day shift than the older nurses. However, within the age range 41 to 50 years of age more nurses preferred to work on a night shift. Equal proportions of nurses aged 50 years and above preferred to either work on a day or night shift.



The rating of workload on night shift by all respondents is shown in Figure 8. The intensity of the rating was from strongly agreed to strongly disagree. Sixty-three percent of the nurses who participated in this survey worked on a day shift, out of this 34% subscribed to the fact that nurses do carry a heavy workload on night shift than on day shift. Of the nurses who worked on a night shift 8% subscribed to the fact that nurses do carry a heavy workload on night shift than on day shift. Regardless of shift worked on,

42% of the respondents indicated that night shift carries a heavier workload than the day shift.

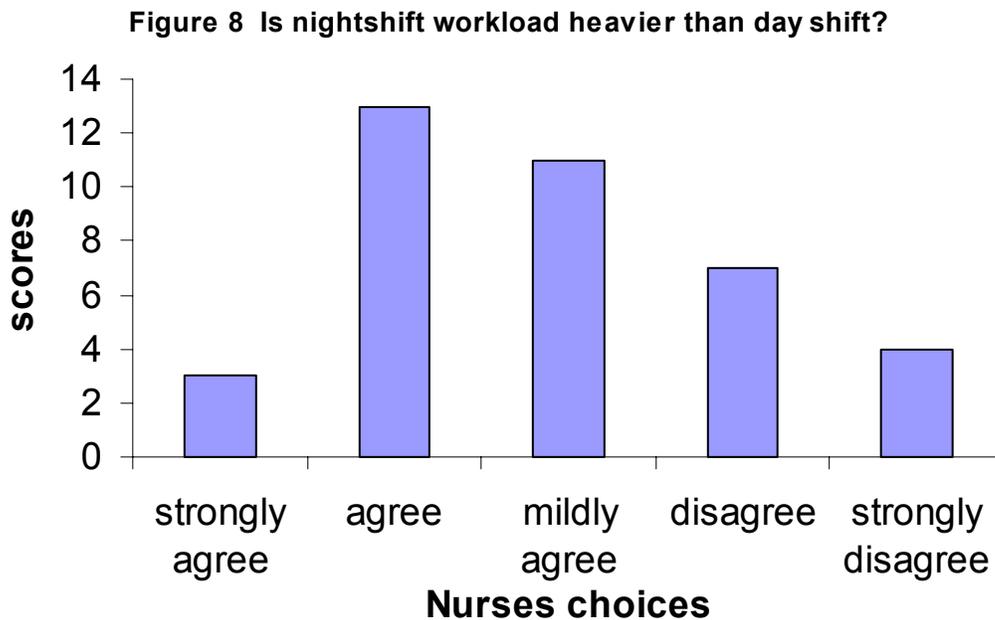


Figure 9 shows the responses of nurses as regards whether they carry heavy workloads on night shift. These responses were provided by nurses who work either on a day shift (67% of respondents) or on night shift. Of the respondents who work on a day shift, 13 and 17% respectively either strongly agree or disagree that nurses carry heavy loads on night shift. These proportions represent 8 and 11% of the total nurses who participated in the survey.

Figure 9 Do nurses carry heavy workload on night shift ?

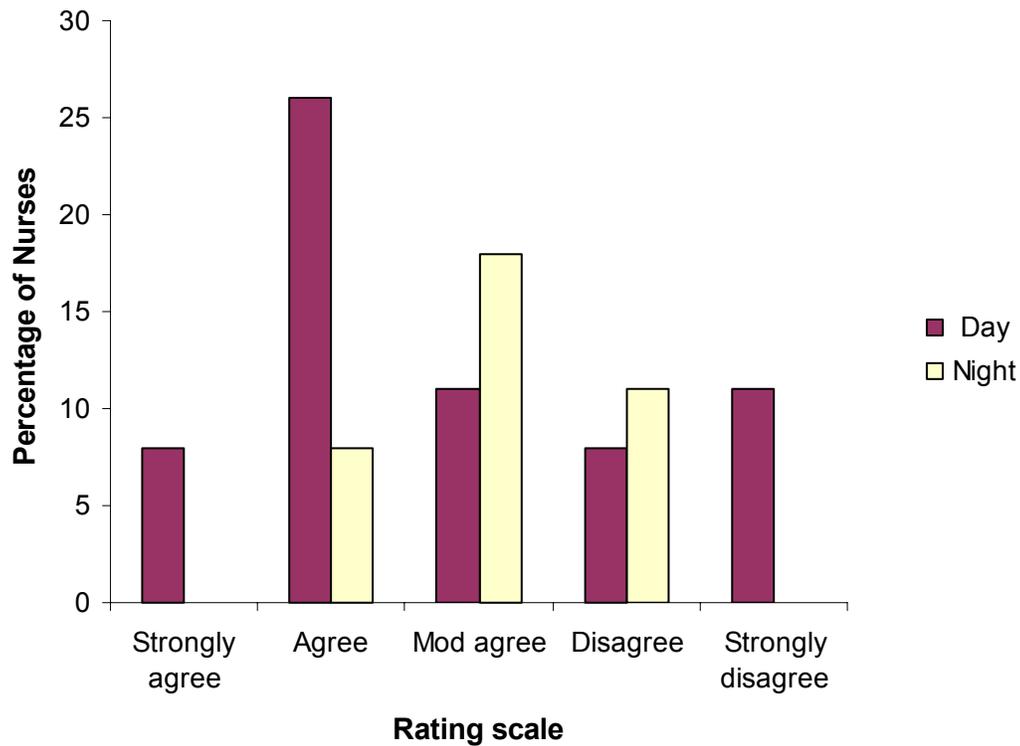


Figure: A comparison of workload between day and night nurses

Surprisingly nurses who worked on a night shift did not provide any response indicating whether they strongly agreed or disagreed. However, whilst 26% of nurse working on day shift agreed that workloads on night shift are heavy, only 8% of nurses on night shift agreed with this proposition. A t-test was performed for choices made by night and day shift nurses as regards the heaviness of night shift. A probability associated with the choices was ($p = 0.16$), indicating that there were no significant differences between the choices of day and night nurses.

Data depicting the various ways in which nurses either experience problems with sleeping and those who have no post night shift sleeping problems are shown in Table 4. The table illustrates that 29% of the nurses with sleep problems take beverages to induce sleep, whilst 30% of the nurses who do not experience sleeping problems listen to music to induce sleep. It is still interesting to note that those without sleeping problems do induce sleep. Twenty one percent of nurses with sleeping problems do take sedatives. This percentage forms 16% of the population of nurses who participated in the survey. Of the total number of respondents, 71% do induce sleep. Worthy of note is the fact that none of the respondents made use of alcohol to induce sleep.

Table: 4. Percentage of nurses with sleep problems and those without problems and various strategies utilized to induce sleep.

Substance used in inducing sleep	Nurses with sleep problems (%)	Nurses without sleep problems (%)	Total (%)
Beverages	29	10	24
Alcohol	0	0	0
Sedative	21	0	16
Music	7	30	13
Reading	18	20	18
None of the above	25	40	29

Figure 10 depicts the level of activity felt by all respondents about working on a night shift. Generally, the 42% of the nurses who are on night shift feel more active than those

on day shift. However, 25% of the nurses who work on night shift do experience tiredness whilst 39% of the nurses on day shift feel tired.

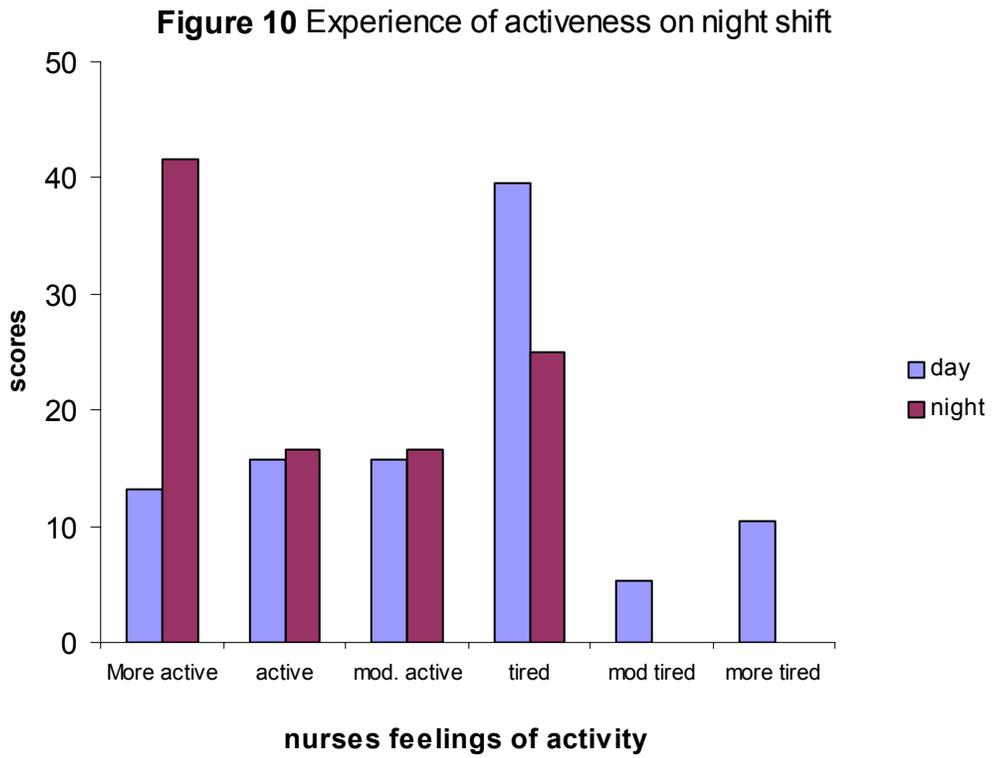
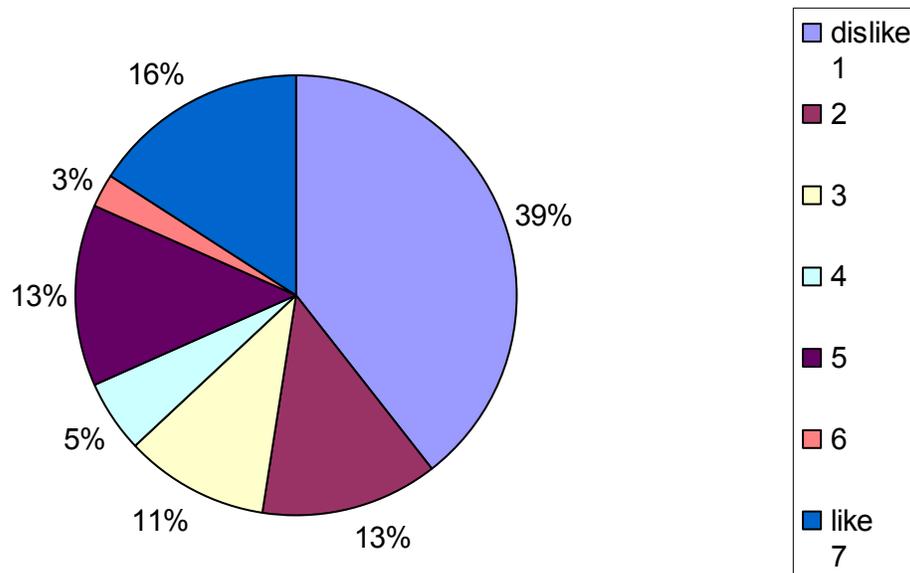


Figure 11 shows percentage of the feelings of nurses regarding night shift.

Nurses' feelings about night shift as illustrated in Figure 11. The intensity of the rating scale was from score 1 to 7, with one indicating dislike, and 7 indicating like. Of all the respondents, 39% indicated a score of 1 (dislike) and 16% of respondents chose a score of 7 (like) along the continuum of the scale. Only 5% (scoring of 4) of the nurses were indifferent to working on a night shift.

Figure 11 Nurses' Feelings about Night Shift



The effect of night shift on nurse's concentration as depicted in Figure 12.

Sixty three percent of respondents indicated that their level of concentration when working on night shift is normal, whilst only 3% were not sure of the effect of night shift.

Figure 12 The effect of night shift on nurses concentration

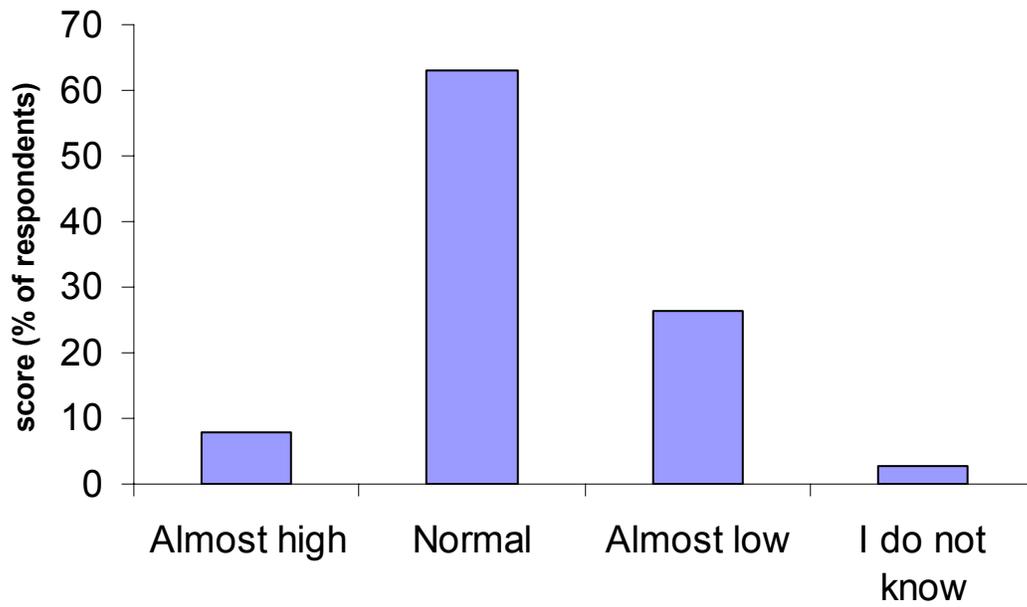
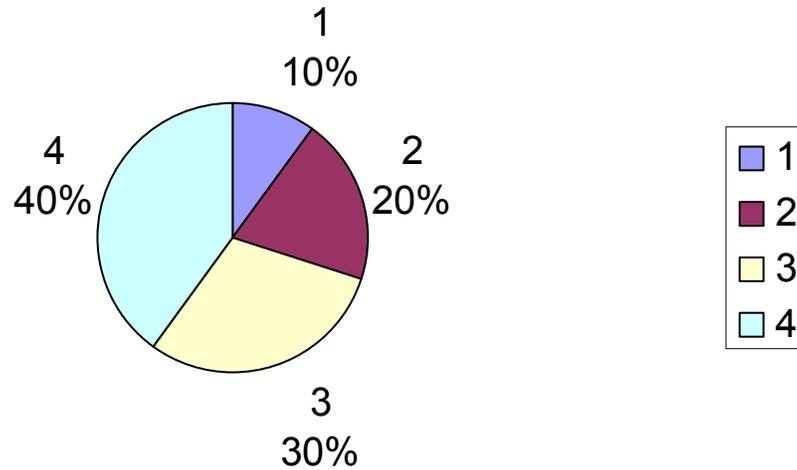


Figure 13 Does night shift affect attitude?



Regarding health, responses were considered on a three-point scale as shown in the pie chart below. The results showed that night shift affected 50% of the respondent's health. Some of the ailments are experienced by nurses working on night shift are shown in Figure 15.

Figure 14 Does night shift affect nurses health ?

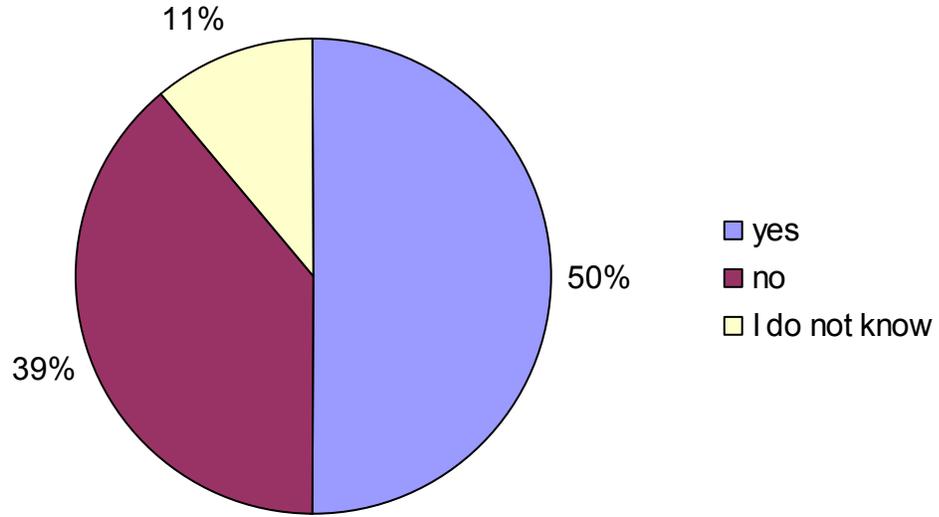


Figure 15 showing ailments experienced by nurses in order of decreasing magnitude are loss of sleep or insomnia (29%) > persistent tiredness (21%) > backache (16%) > frequent headaches (13%) > feet ailments (5%).

Figure 15 Ailments experienced by nurses on night shift

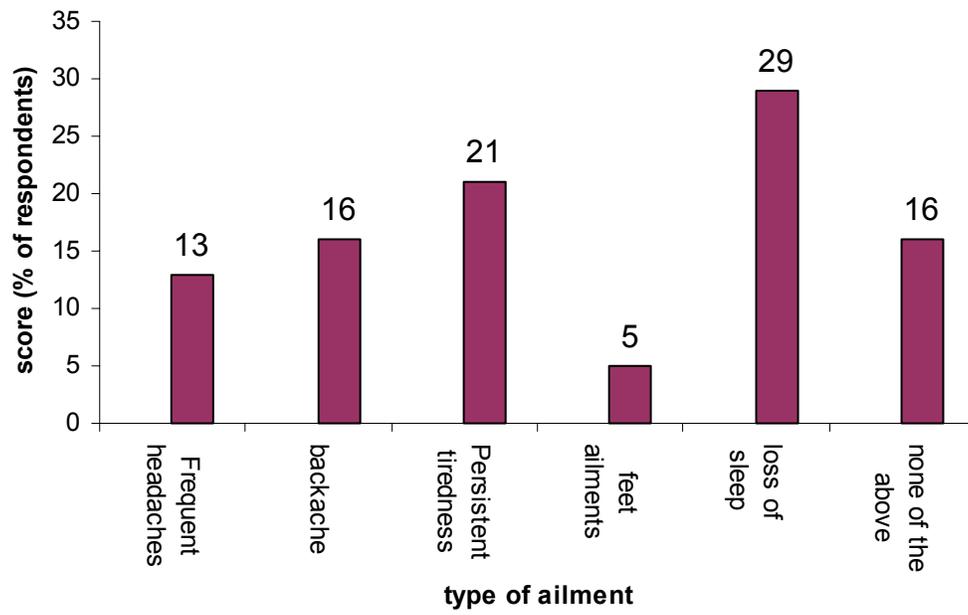
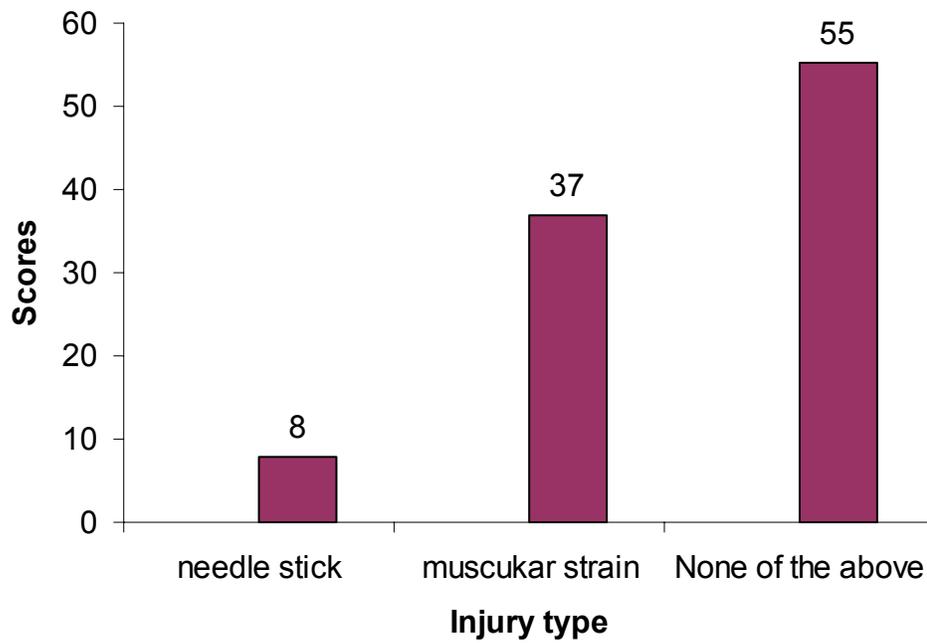


Figure 16 Distribution of occupational Injuries



The most commonly sustained injury was muscular strain (Figure 16), with needle stick injuries accounting for only 5% of the occupational injuries.

CHAPTER 5

5. DISCUSSION

In order to meet the demand for an improved efficiency of dealing with the extended hours of work in some industries, there has been an increasing drive towards the use of shift-workers. The present study illustrates the need for a continuous service delivery in the Health Industry. This makes it necessary for workers to work on different shift schedules.

Shift schedules

Nurses work in a health delivery system that operates on a 24-hour basis in administering health care for sick individuals. Governmental Institutional efforts are complimented by the Private hospitals in South Africa. Results from interviews with the Nursing Managers of some hospitals showed that all categories of nurses do work on a night shift schedule, whether by request or officially allocated.

Nurse Managers allocate nurses to work in different sections of both hospitals. Priority in the planning for staffing and scheduling of nurses is done according to the specific requirements of the hospital. There is no written policy or guideline for both scheduling and staffing. Indications from the Nurses Trade Union are that nurses have forwarded complaints of unfair distribution of night schedules, which are attributable to the lack of guidelines to be used by schedule planners. It is noted that hospitals allow for flexibility

towards arrangement of shifts whenever the need arises. Nurses on both shifts undertake overtime duties, depending on the number of hours they are off duty and in agreement with hospital managerial requirements.

The pattern of shift schedules is similar to the schedules described in the reviewed literature. Nurse's work on long 12-hour shifts on both day and night shifts. The arrangement differs between hospitals. Some hospitals have adopted the pattern of 7 days in a stretch whereas others break up the week into two working sessions. Out of the total respondents, 63% of the nurses requested to be in their respective shifts; 58% of the nurses requested to be in the day shift and 42% requested to be in the night shift. Amongst the respondents, 66% do not prefer night shift and 32% say it suits their lifestyle. Only 3% indicated that it is financially rewarding. Even though nurses opt to work on night shift, they do encounter some difficulties with this shift.

Problems of night shift

There is a diversity of problems encountered by nurses in a normal working situation. Some of these may be physical, physiological, psychosocial, socio-economic, and cultural or health related. Night work intensifies problems since the individual is working when the body clock is naturally telling the majority of the people to rest. Problems vary with each individual since the biological structure is different.

The influence of circadian rhythms on the night worker

Experiences of nurses regarding night activity were explored using a rating scale. The range of the rating scale was a 6- point scale, 1 scoring more active to 6 scoring more tired. It is noted that the more active score (1-3) is dominated by nurses on night shift and the more tired score (from 4-6) is dominated by the nurses on day shift. This confirms the fact that some nurses prefer to work on night shift since they are comfortable with it. As previously, mentioned differences in the circadian rhythm make other people to be at their peak in the evening and some to reach their peak in the morning (Rogers *et al.* 1986). The 'night owls' prefer night shift and the 'morning larks' prefer day shift, hence 42% of respondents requested night shift and 32% prefer day shift.

Circadian rhythms can get out of phase with an abrupt change in an individuals activity pattern. Certain people take a long time to adjust to changes due to the internal clock rhythm. The inability to keep track with the time cues results in a person being frustrated and this affects ones attitudes towards work and interaction with other people. Change in ones psychological processes could affect the ability to concentrate as reported by Bohle and Tiley, (1989) and Pheasant, (1991). The study revealed a number of self-reported psychological symptoms affecting the shift workers such as frequent headaches and the subjective responses to irritability noted.

The survey also examined if nurses felt more energetic when working on night shift. The results showed that 56% of the nurses did not feel energetic, 18% were neither energetic nor less energetic, 26% felt energetic. The focus group also felt tired on the night shift, especially the group without rest periods. Tiredness may be due to insomnia, changes in sleeping patterns, variations in length of shift periods, and circadian rhythms. Nurses also felt that there is a sleep deficit and as such, they tend to spend their first night-off hours in bed. The fact that about 21% of the respondents experienced persistent tiredness implies that their performance could be impaired. This inefficiency in performance could have deleterious consequences on the health care of patients. Other effects of a poor health delivery system will be the dwindling attendance and the loss of valuable income.

Insomnia

Another problem faced by night shift workers is the lack of sleep or insomnia. Fifty percent of the respondents working on day shift indicated that they do not get enough sleep when on night shift, whilst only 18% of night nurses complain of a lack of sleep after working on night shift. Among the whole group of respondents, 66% sleep for less than 5hrs, another 34% of respondents sleep for 6hrs to 7hrs. Amongst day and night nurses of all age groups, no one sleeps for eight hours or more, after night shift. The results reveal that thirty percent of the nurses who opted to work on night shift sleep for less than 5 hours, whilst 70% slept for 6 to 7 hours after the shift. The data obtained form

the survey showed that 74% of the nurses have a problem with falling asleep after night shift, implying that 26% did not have a problem. Insomnia is a prevalent ailment that affects all categories of nurses who participated in this survey. Rodgers et al., 1986, have noted differences in the biological make-up of individuals. These differences can create difficulties for some people when they are expected to adjust from a diurnal working schedule to working on a night schedule. This is in line with suggestions by some nurses who have no problems with working on a night shift. They indicated that they were more energetic when they work on night shift. This evidence collaborates that of Rodgers *et al.*, 1986 who pointed out that some people are 'evening types' whereas others are 'morning types'. Preferences towards shifts have an influence on each individual towards adaptation to night shift.

Other problems associated with night shift included drowsiness, loss of sleep, tiredness, backache, low concentration, and social problems. Sleep is a major concern since it affects the health and the performance of nurses who are dealing with human lives. The health care workers in this survey have indicated that they are exposed to such hazards and mistakes. These nurses are responsible not only for their lives but for the life of others and for the patients under their care. Nurses working in the children's units, intensive care units, operating theatres, obstetrical units have more responsibilities, and are required to be more alert, to make quick decisions about lives of these people. Any mistake or accident resulting from fatigue or stress can cost a life of the next person, resulting in law suites and claims from patients. In cases where incidents end up with a

disciplinary action by the authorities, the nurse's life becomes, affected psychologically, socially and physiologically due to stress.

In spite of the above problems associated with working on a night shift, there are some benefits gained from such a working schedule. Nurses are paid various night shift allowances depending on the number of hours worked and rank. The cumulative benefit exceeds that of working on a day shift. They have more free time to work overtime, thus increasing their income over and above that of their colleagues. This shift also allows nurses to engage in professional academic development programs. Some nurses prefer to be on night shift to have some time for their studies during the long hours of rest.

Strategies to induce sleep

An important factor to note is that 71% of respondents use some form of strategy to induce sleep. The respondents, who indicated that they have no sleeping problems when on night shift, have to use some form of strategy to induce sleep as well. Several options to induce sleep were mentioned and these included the use of beverages, essential oils, reading and music. Twenty one percent of nurses with sleep problems take tablets to sedate themselves. Some nurses who have a sleeping problem, as indicated in the results take some form of medication to induce sleep. From the medical point of view, continued intake of medication or sleeping tablets affects the physiological and psychosocial well-being of the individual. It is not advisable to take medication without consultation with

the medical doctor. An important fact to remember is that induced sleep is not restful and tablets can be habit forming.

Work performance

Nurses regarded the time of 12 hours allocated for either the day shift or night shift as too long. The nurses feel that night shift has a heavier workload than the day shift. They attribute this to the fact that there are fewer nurses working at night. The temporary supporting night nurses not as competent as permanent staff to deal with peculiar problems encountered in specialised wards. This makes it necessary for night nurses to work extra hard to keep their sections functioning to the desired health care standards. On the contrary, it has been assumed that there are limited health care activities that require attention by night nurses, making the workload on this shift to be lighter and less strenuous. The workload of the night nurses is dependent on the intake of patients during a particular day. Management is facing a problem of an unpredictable patient influx on each day. A nurse who is reporting late that she is booked sick or not feeling well disrupts the system of calling the agency nurses. The availability of the support staff also influences the amount of work carried out by the night nurses. In general, 8% of day shift respondents strongly agree that night shift carries a heavy workload and 11% strongly disagree to it being a heavy load.

To find out about attitudes and preferences of nurses towards night shift their opinion was sort using a rating scale. The intensity of the rating scale was a 7- point scale, with 1 scoring 'dislike' and 7 scoring 'like'. The overall score for dislike rated at 63%, sixteen percent of nurses liked the shift and those who neither liked nor disliked night shift formed 5%. The results revealed that nurses who liked night shift reported minimum problems with this shift. The dislike of night shift could be attributable to the fact that they experience sleeping problems along with other ailments. Poor attitudes could irritate patients, lead to conflicts between staff and patients and even amongst staff. There will also be a low motivation towards work and errors in administering health care. Performance goes along with motivation, which is the drive towards productivity. Productivity is essential to save human lives in health care.

Psychosocial problems

It is important to note that even though nurses make a request to work on a night shift, they still regard it as being strenuous. Some of the nurses in the focus group stated that they opted to work on a night shift because of problems associated with securing the required safe transport back home after working on the day shift. For instance, a respondent indicated that handing over of reports to the next nurse after working on a day shift implies that she will get to the taxi rank after 7 pm. The implication is that she will have to use an expensive means of transportation back home (i.e. metered taxi) which is more than she can comfortably afford. There are also risks associated with waiting for a metered taxi at the rank at night due to frequent muggings, rapes and theft.

This survey examined concentration as one of the psychological concepts in the study of night shift. Subjective information gathered from the subjects, working day and night shifts revealed that 26% of respondent felt that their concentration is low, 63% felt that their concentration is normal, and 8% felt that is almost high even on night shift. The focus group stated that sometimes the hospital, is too busy, and they get too tired and have difficulty to fall asleep. The nurses experience physical and mental workload since their job involves standing, walking, bending, lifting and making decisions about patient care and other administrative work. All this leads to exhaustion, which disturbs concentration. Åkerstedt, (1996), state that another aspect of tiredness concerns the ability to make complex decisions, which require thinking. This means that a tired person is unable to think clearly. The study by Makowiec-Dabrowska, *et al.* (2000), examined whether nurses can work a 12-hour working system, the results concluded that the system had less significant physical workload but greater mental workload.

Effect of nightshift on social life

Some of the problems of night shift and the dislike of this shift emanate from the social difficulties encountered by nurses in the focus group. For example, nurses who consistently work on night shift on weekends and public holidays develop a negative attitude towards the shift. Adaptation to night shift could be influenced by the social status of the individual within the community. For instance, the marital status, family

needs, societal values and the lifestyle of the individual within the community influence the nurse's attitude towards night shift. Night shift causes an imbalance between desired lifestyle and work. Women have a major role to play in the domestic life and they compromise their sleep to undertake the domestic chores such as care to their children and family chores.

To find out whether night shift affects the social aspect of nurses or not a 6-point scale, rating from 1 as agree to 6 rating as disagree was used. Fifty percent of respondents stated that their social life is affected, 37% disagreed and the rest was in between the extremes. On rating the whole scale, 63% of the nurses are affected and 37% not affected. The aspect of social life discussed with the focus group where they say their social life involves their families, work relationships and other social groups. Seventy five percent of the focus group, say the social life is affected. Nurses are concerned about leaving their spouses every evening; some do not see them until they are off due to work. They are unable to help children with schoolwork, and loose social contact with friends and important others. Managers state that nurses feel that they are in isolation when on night shift, especially the permanent night shift nurses. There is another concern raised by the Trade Union that there is exposure of nurses to psychosocial hazards due to unfair distribution of schedules. Conflicts do arise if unfair labour practises exist in the workplace as stated by the union. Exposure to disciplinary actions (pointed out by Trade Union), responsibilities, and liabilities of the nurses is another factor, which have an

effect on social aspect at work. Low concentration levels, attitudes towards work relationships can cause mistakes that put nurses in disciplinary procedures.

Some other factors outside the individual can affect sleep in these workers. The nurses pointed out that the home environment can contribute to sleep problems. In South Africa, many people live in areas where there is a lot of noise from cars, machinery, people and noisy music systems from taxis. All this noise is experienced during the day and the noise level has a huge impact on the sleeping time of the night worker. Another factor is that the country is very hot in summer and these environmental and climatic conditions have a direct bearing on the night worker when the temperature range is from 30°C and above by 11:00hrs.. The housing structure is not conducive to good sleep, overcrowding, houses built too close to each other and the material used to build the houses is of poor material. Ditsele, (1999) described housing, noise and climatic conditions as factors affecting the performance of the night worker in South Africa.

The Health Status of the Night Worker

Regarding health status of the respondents during night shift, 50% of the nurses felt that their health is affected, 39% had no health problem and 11% did not know whether night shift affect them or not. Amongst the respondents, 13% are troubled by frequent headaches, 16% by backache, 21% by persistent tiredness, and 29% by insomnia and the rest suffered from feet ailments. The prevalence of these ailments indicates that health risks exist with shift work and night shift as stated in literature. Sleep problem dominated in ailments of all age groups of the respondents. To note was that 33% between ages from

21-30 had sleeping problem, 31-40 formed 29% and the older 41 to above 50 groups were 25% respectively.

Another health related problem was that of exposure to occupational injuries and diseases. The results show that 45% of the respondents sustained either a needle stick injury or a back injury. Twenty percent of respondents indicate that the incidents occur on night shift. The management records in hospital -1 show that needle stick injuries are increasing and the other hospital indicated that NSI is not common. Taking into consideration that a standardised procedure does not exist, some of the statistics for occupational injuries could be inaccurate. NSI can occur if the nurse is too busy, drowsy or tired where she is likely to loose concentration and cause an accident. NSI predisposes nurses to infections such as Human Immuno Virus (HIV), Acquired Immuno Deficiency Syndrome (AIDS), Hepatitis B, and other viral infections. Lack of knowledge and skill exposes nurses to such harmful conditions and other hazards such as back injury. Back injury can occur due to lifting sustained or prolonged awkward postures in the case of nurses. In general, backache can occur can result from exposure to psychological hazards. According to previous studies stress is a psychological problem which manifest itself with aches and pains of neck or back pain depending on the biological structure of the person. Some of the respondents indicated that their existing ailment was backache from unknown origin. The assumption for such muscular skeletal disorder is its relation to stress. Orientation of newly employed nurses and in-service training, and procedure manuals are tools that assist managers in educating and development of staff thus reducing hazards. According to Lipkin *et al.* (1998), nurses form a high-risk group for the

chronic fatigue syndrome possibly due to exposure to occupational stressors, such as exposure to viruses and stressful shift work that interfere with their biological rhythms.

The influence of gender

The influence of gender has its own highlights in this study. Male respondents in the survey had worked for a period exceeding 5 years in the hospital. Regardless of marital status respondents requested to work on a day shift. This is probably due to fact that they need to be with their families or their young age.

The unmarried respondent requested to work on a day shift. The married male nurse regarded night shift as strenuous, this was in contrast to the suggestion made by the unmarried male nurse. This nurse regarded night shift as comfortable and had enough energy to perform his duties, but did not have enough sleep when on night shift. They needed to induce sleep by reading. Night shift was regarded as having a heavy load by 50% of male nurses when interviewed. There was no conclusive decision regarding performance during night shift by the respondents. All male nurses had normal level of concentration during the night shift, with the shift not having an effect on their general attitudes. Night shift affected the social life of male nurses but did not seriously affect their health. However, they complained about feet ailments. This could be associated with theatre work, where there is a lot of static standing.

Some aspects of shift scheduling may not be feasible, especially because health industry has more female shift-workers than in other industries. For example working three

rotating shifts can be very strenuous for a female nurse with children and other family responsibilities. For these nurses other patterns of shift schedules are not only strenuous but also dangerous since they involve transport problems. Travelling or driving at night for female people in South Africa is dangerous (95% of respondents comprises of female nurses). Street *et al.* (1997), in their study they strongly endorsed the need to take into consideration nurses scheduled for shift work. They argue that the personal, socio-cultural and environmental perspective of the nurse need to be given attention by the various stakeholders involved with rostering.

6. Recommendations

6.1. The Recommended Shift-work schedules according to Ergonomic Design

Within the health care system, a number of working schedules have been adopted in an attempt to improve work schedules and align these with the International Labour Office (ILO) 1990 recommendations for shift work. Since shift-work is unavoidable, governments, employers and employee representatives work on the issue of working time arrangements for the benefit of the employer and employee and the survival of industry or service. For industries there is global competition for economy, and for health industry, patient care cannot be compromised. Looking at these circumstances all stake -

holders should come to an agreement to formulate working time that will offer advantages to the employer and employee (Åkerstedt 1996).

Assessment of advantages and drawbacks of shift system should be done based on objective criteria. Adjustment of physiological functions to night work, level of well being, health problems, and disturbances in personal life, accident rates and performance efficiency are all taken into consideration in shift-work design. If a product, environment or a system is intended for human use, its design should be based on the characteristics of its 'human users'. Ergonomics provides the scientific foundation and research techniques that could be found satisfactory, as it has been in the past although some had problems (Pheasant 1991).

ILO, (1990) adopted a Night Work Convention, which was represented by a large number of states. Some of these are points related to occupational health services. The recommendations are in accordance with ILO Convention 171, Article ILO (1990a). The convention stated that permanent and rotating night workers are generally a population at risk and are to be included in medical screening, and should be given special attention as they are exposed to work load and extended working hours. Night workers may suffer from psychobiological desynchronisation

The recommendations that should apply to all countries and enterprises are in accordance with the ILO Night Work Convention, (1990a). Recommendations include; Appropriate health services for night and shift-workers, First aid facilities, Option to transfer to day work for health reasons, measures for women on night shifts, in particular special maternity protection (transfer to day work, social security benefits, or an extension of maternity leave), the right of consultation on details of work schedule (Koller, 1996).

Knauth, (2001) also state that the most important ergonomic recommendation is that night work should be reduced as much as possible and permanent night shift is not recommended. Schedule planners should avoid quick change over from night to day on the same day or from morning to night. The number of consecutive working days should be limited to 5-7. Every shift system should include some free weekend with at least 2 successive full days off. Time of recovery, and rest breaks must be considered. Schedule to be regular and predictable.

It has been proven that clockwise direction of schedule is easier on circadian rhythm. These involve rotation from day to evening then to night shift. The shorter shift of 8 hours is much easy to apply but the present choice is the 12-hour shift (www.circadian.com)

6.2. Specific Recommendations

Based on the findings of this research, it is important to note that scheduling of shifts differ in style and arrangement according to needs of each institution. However, managers have stated that nurses have a freedom of choice regarding shifts. This is not always the case since the number of those who prefer night shift is lesser than those who dislike night shift. Some nurses have to work shift work regardless of whether night shift suits them or not. Nurse Managers have a responsibility to formulate strategies to assist those who find it difficult to work at night.

The findings of this research show that there are strengths and some shortcomings in hospital management systems. Management can use these as a point of departure to plan the administrative processes for hospitals. Managers need to realise this managerial strategy, and bring about change based on the situational analysis of all processes within each institution. Recording and follow up of good and bad incidents will be the foundation for planning.

A situational analysis will assist managers to identify the existing occupational hazards affecting the nurses, and they will be able to forecast on possible strategies that can help reduce hazards in hospitals. It will be possible to follow certain trends that can disturb the smooth running of the organization. Hospital management as well as the Board of

Directors should be aware of the relevant programmes to assist in future plans, which will benefit all the stakeholders (employers, employees, health care receivers/patients) under their jurisdiction.

Flexibility towards shift schedules is one of the strengths of the hospitals in this survey. Unit managers are encouraged to identify those nurses who prefer to work on particular shifts, especially the night shift. This survey revealed that most of nurses who like the shift suggested that they had minimum or no problems with night shift..

Links with other health related structures such as Occupational Health and Safety organisations or societies can be of assistance to management. Occupational Health service provides guidance towards identification of all types of occupational hazards and remedial actions to hazards in the workplace. It is cost effective to develop the programme within the institution depending on the availability of personnel resources. Management have the final control over work organization and professional requirement within the organization.

Introduction of an occupational health service could assist management in the creation of awareness about occupational health problems such as stress, injuries and diseases. The service is responsible for approved periodical examinations, for keeping of records and

plan the educational programmes based on the available statistics. Night and day nurse's benefit from programmes designed for reduction of stress in the workplace. This could function on a smaller scale and contribute towards health and safety of personnel.

Sleep evaluation programme is recommended as a strategy to identify those nurses with major problems. This survey was not conclusive towards the sleep problem. Specific indicators can reveal more.

Management to ensure that recruiting and training of supportive nursing personnel is according to expected standards of nursing practice. The agency or temporary nurses have a contribution to the service of the hospitals and their participation in the organization has an influence on the delivery of health care. The nursing Agencies have a responsibility to allocate competent personnel to hospitals, ensuring that they are of benefit to all stakeholders within the service.

Planning of shift schedules is based on the inputs of all the people involved. The employers, supervisors and the employees contribute towards planning and implementation of shift schedules for the nurses. Consideration of nurses' needs for a particular shift and involvement is important for motivation and acceptance of shift

schedules and work. Motivation could improve adaptation of the nurses to awkward hours of night shift.

It cannot be possible to meet all the needs of different nurses when planning schedules. On the contrary, it is possible to make adaptations that can reduce the strain of the long hours worked on night shift. Considering problems facing the hospital management, a complete change is not possible.

Introduction of certain adjustments such as stipulating official rest periods for the night nurses in an attempt to reduce some of the ill effects of night shift. The important factor to be recognised is that the 12-hour night shift is too long and the absence of variations in activities makes it more monotonous and strenuous. This makes the body to be unable to adjust and perform as expected without rest.

Management need to take into consideration the lack of transport for other nurses, it is necessary to continue with the 12-hour shift instead of a rotation shift of 8-hour shift as pointed out by some nurses. It may not be possible to make arrangements for transporting nurses, as this require further research and budget from management. Nurses come from different areas of the city and outside the city of Pietermaritzburg. There is therefore a need for adjustment from the management in meeting needs of the whole service.

Management is encouraged to provide a psychologically supportive environment to the nurses. Rest rooms should provide tranquillity and be conducive to contemplation in an attempt to relieve psychological stressors. Music, reading material, games provide relaxation to many in the workplace. The comfort of the environment and the furniture used for resting is essential and conducive to complete rest. Those who feel tired can benefit from a separate resting area from the cafeteria or the work area.

Patient low intake could be a loss of income to the organization. This is also an indicator for underlying problems affecting nurses such as bad attitudes due to stress of work. Nurses are means towards good patient care, if they are frustrated they will lower their performance thus the service will not be a service of choice and desire for the recipient and will not be cost effective to the provider. A healthy, comfortable workforce is the one that is productive and satisfied with their output or product.

Recommendations directed to nurses attached as appendix 5

CHAPTER 7

7. Conclusion

This study shows that all age groups are subject to exposure to physiological and psychosocial hazards brought about by night shift as indicated in their subjective responses. The findings of this research reveal that private hospitals recruit and employ younger population of nurses, and there are very few nurses over the age of fifty. Regardless of the fact that the younger group of nurses dominated in the survey, it is noted that all age groups of nurses employed in these hospital do have complaints about night shift. Few nurses did not experience problems from the night shift; as a result, they preferred to be placed permanently on night shift. The majority of the nurses complained of a number of problems when working on night shift. Other nurses could not cope with night shift schedules as such they negotiated for a change to day shift.

The recent developments regarding shift-work, is aimed towards improvement of health of the shift-workers, the physical, and psychosocial well being as stated by ILO. ILO has highlighted that recommendations should be relevant to the specific groups and work systems. Noted is that each sector has its own specific needs, especially health sector as it

deals with patient care. 'The night shift worker is a man at odds with his own body rhythms' as stated in Pheasant, (1991). When managers are planning shift schedules should be aware of these biological rhythms as explained by other researchers. Literature has explained that there is no perfect schedule; the main factor is the consideration of the inputs from the participants in shift work.

The working environment has adequate space, clean, well ventilated with good lighting. Provision of resting time and facilities is still a problem in hospitals. In some wards, facilities have been provided but time is not adequate to provide recovery and strength to go back to work. The body needs to recover from the physical, physiological and psychological strains of working against the body clock. Rest periods allows for replenishing and refreshing of the body for further performance with minimal or no errors. Errors are the cause of accidents as noted in literature. Accidents are costly in terms of the Compensation of Occupational Injuries and Diseases Act, (1993).

The Ergonomist and management have a responsibility to design a work schedule that will suite health industry without compromising the life of the employee, employer and the society served by the nurses. Shift-work environment should be comfortable, safe, and free from hazards such long hours at work. Further studies are required to find out the extent of present demands from nurses. Management will benefit with further research in this area. The purpose of this research was to identify hazards affecting nurses

working on night shift and to make recommendations based on the findings. The present recommendations represent only the immediate problems examined on a smaller scale involving only the private hospitals. Comparisons between the public and the private sector can reveal more problems thus helping the whole health industry.

CHAPTER 8

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Appendix 1: Interview questionnaire for managers

Interviewer: Sizeni Madide

Industrial Ergonomic Student

Luleå University (Sweden)

1. Macroergonomics (Management issues)

1.1. Number of nurses (Permanent)

- I. Registered Nurses: -
- II. Enrolled Nurses: -
- III. Enrolled Nursing Auxiliaries: -

Total: - _____

1.2. Target Units

Rank	SURG	MED	OBSTETS& GYNAE	OT	ICU	PAEDS& NEONATE			
R/N									
E/N									
E/N/A									
TOTAL									

1.3. Compulsory night duty for all categories: -

1.4. Special Considerations: -

- I. Sickness _____
- II. Physically disabled _____

- III. Newly employed (period prior to Night shift) _____
 - IV. Age group _____
 - V. Pregnancy _____
 - VI. Nurses who have small babies specific period after maternity leave _____
 - VII. Are special requests permitted – exchange of shifts etc _____
 - VIII. Option for overtime – please state reasons _____
 - IX. Option for part – time or flexi –time (please State conditions) _____
 - X. Option for permanent night shift _____
- 1.5. Nurses on permanent night shift – specific conditions _____
- 1.6. Policy guidelines for night shift- copy of Policy on night shift (or similar policy).
- 1.7. Number of different shift patterns in the institution please state reasons for differences between units
- 1.8. Is scheduling of night shift according to specific developed program? (Any guidelines for scheduling)?
- 1.9. Who is responsible for scheduling of shifts?
- 1.10. Who is responsible for staffing of units?
- 1.11. Are the nurses given adequate time before a change of a shift? Any specific time
- 1.12. Special provision made for any changes such as unexpected patient influx, absenteeism for day and night shift
- 1.13. Day and night shift schedules – copies requested.
- 1.14. Number of hours worked per week in - Day shift _____
Night shift _____
- 1.15. Number of hours worked per night _____

- 1.16. Number of breaks per shift and duration _____
- 1.17. Workers' satisfaction about night shift schedules
- 1.18. Overtime for night shift please state hours permitted per person. _____
- 1.19. Is Moonlighting allowed within the institution?
- 1.20. Any policy or guidelines in place for moonlighting?
- 1.21. Level of absenteeism and possible causes of absenteeism
- 1.22. Sick leave reporting system for all nurses
- 1.23. Absenteeism policy
- 1.24. Special incentive for night shift or any shift
- 1.25. Leaves – all types and duration
- 1.26. Common complaints about night shift (from nurses).
- 1.27. Customer satisfaction with regard to night service
- 1.28. Trade Union activities – Is night shift a burning issue? Has there been any dispute involving night shift, during the last 3yr period?
- 1.29. Collaborative relationships with all departments
- 1.30. Mission statement and vision of the institution.
- 1.31. Organizational structure
- 1.32. Community served by the service (Geographically)

2. Facilities

Any provision made for the following: -

- Tea room
- Rest room
- Restaurant – Hours of service for night staff
- Bathrooms
- Toilet facilities

3. Health

- Provision made for sick nurses (Health facility – day and night)
- Common occupational injuries during night shift
- Common complaints or illnesses presented by (permanent) night nurses-
Statistics requested
- Injury on duty (IOD) – Day and Night statistics requested

4. General Comments

- 1.33. Continuity of patient care (what has been observed generally)
- 1.34. An established communication between night managers and day managers regarding staffing and schedules.
- 1.35. Regarding night shift, are there any improvements that have been undertaken within the period 2000 to 2002?
- 1.36. Regarding night shift, what are the strengths and weaknesses
- 1.37. New strategies to balance work organization and shortcomings of night shift schedules.
- 1.38. Utilization of Health and Labour legislation such as Occupational Health and Safety Act (Act 85 of 1993), Compensation of Occupational Injuries and Diseases Act (1993) and other health related legislation
- 1.39. Is ergonomics a general consideration in the organizational principles?

Appendix 2: Interview Questionnaire for the focus Group

Facilitator: Sizeni Madide

1. Group of nurses
2. Gender
Females = Males = Total =
3. Placement
Permanent night shift
Temporary night shift
4. Hours worked per shift
5. What is the feeling about the present shift schedules? Please comment
6. Number and duration of breaks – adequacy, facility for resting comfort
7. What makes others to prefer night shift?
8. What makes others to prefer day shift?
9. How is the work demand on night shift as compared to day shift?
10. Which shift do you find most strenuous?
11. What attributes to difficulties or problems_during or post night shift?
12. Regarding sleep, are there any problems? example- Adequacy, taking too long to fall asleep, insomnia, when one is off duty
13. Are there any strategies used to induce sleep post night work?
14. Fatigue – is it a problem?
15. Is performance and concentration affected?
16. Health issues – difference or health changes experienced between day and night shift, exposure to hazards, or other problems.

17. Social relationships – family, friends etc.
18. Security, safety, and comfort
19. Are there any incentives
20. Suggestion for improvement of shift schedules.

THANK YOU!

Appendix 3 Shift Schedules for Target Hospitals

3. a. Day shift schedules for a four week period in Hospital - 1

WEEK 1

Nurses	Mon	Tues	Wed	Thurs	Friday	Sat	Sun	Hrs. worked
1	E	PM	E	PM	DO	DO	7	40
2	7	DO	AM	7	7	DO	DO	39
3	DO	7	7	DO	PM	7	DO	39
4	DO	7	DO	7	DO	DO	7	33
5	E	E	E	PM	E	DO	DO	40

WEEK 2

Nurses	Mon	Tues	Wed	Thurs	Friday	Sat	Sun	Hrs. worked
1	E	E	E	E	PM	DO	DO	40
2	7	7	DO	7	7	DO	DO	44
3	DO	7	7	DO	7	7	DO	44
4	7	DO	7	7	DO	DO	7	44
5	DO	E	E	E	PM	E	DO	40

WEEK 3

Nurses	Mon	Tues	Wed	Thurs	Friday	Sat	Sun	Hrs. worked
1	E	PM	AM	E	DO	DO	7	40
2	DO	7	DO	DO	7	7	DO	33
3	7	7	DO	7	7	DO	DO	44
4	7	DO	7	7	DO	DO	7	44
5	E	E	E	E	PM	DO	DO	40

WEEK 4

Nurses	Mon	Tues	Wed	Thurs	Friday	Sat	Sun	Hrs. worked	Total hrs. in 1month
1	E	AM	E	E	AM	DO	DO	40	160
2	7	7	DO	7	DO	7	DO	44	160
3	7	DO	7	7	DO	DO	DO	33	160
4	DO	DO	7	DO	7	DO	7	33	154
5	DO	E	E	E	E	PM	DO	40	160

KEY:

E = working 7-4

AM = Morning off

DO = Day off

7 = Working from 7 to 7

PM = off at 13hrs

3. b. Night Shift Schedule for a period of 4 weeks in Hospital 1

WEEK 1

Nurses	Mon	Tues	Wed	Thurs	Friday	Sat	Sun	Hrs. worked
1	ON	ON	OFF	OFF	ON	ON	ON	55
2	ON	ON	OFF	OFF	ON	ON	ON	55
3	OFF	OFF	ON	ON	OFF	OFF	OFF	22
4	OFF	OFF	ON	ON	OFF	OFF	OFF	22

WEEK 2

Nurses	Mon	Tues	Wed	Thurs	Friday	Sat	Sun	Hrs. worked
1	OFF	OFF	ON	ON	OFF	OFF	OFF	22
2	OFF	OFF	ON	ON	OFF	OFF	OFF	22
3	ON	ON	OFF	OFF	ON	ON	ON	55
4	ON	ON	OFF	OFF	ON	ON	ON	55

WEEK 3

Nurses	Mon	Tues	Wed	Thurs	Friday	Sat	Sun	Hrs. worked
1	ON	ON	OFF	OFF	ON	ON	ON	55
2	ON	ON	OFF	OFF	ON	ON	ON	55
3	OFF	OFF	ON	ON	OFF	OFF	OFF	22
4	OFF	OFF	ON	ON	OFF	OFF	OFF	22

Week 4

Nurses	Mon	Tues	Wed	Thurs	Friday	Sat	Sun	Hrs. worked	Total hrs. in 1 month
1	OFF	OFF	ON	ON	OFF	OFF	OFF	22	160
2	OFF	OFF	ON	ON	OFF	OFF	OFF	22	160
3	ON	ON	OFF	OFF	ON	ON	ON	55	160
4	ON	ON	OFF	OFF	ON	ON	ON	55	160

KEY:

ON = on duty

OFF = off duty

3. c. Pattern of Night Shift Schedules in Hospital- 2

Example of schedule for two weeks (end of December 2002 to 12, January 2003)

WEEK 1
December January

WEEK 2

30	31	1	2	3	4	5	6	7	8	9	10	11	12
M	T	W	T	F	S	S	M	T	W	T	F	S	S
N	N	N	N	N	N	N	ON						

KEY:

N = Night off

NO = Night on

Adapted from the hospital schedules prepared by Unit Managers for (2002-2003).

Appendix 4: Questionnaire for Nurses

Researcher: Sizeni Madide

**Luleå University of Technology
Industrial ergonomics division
S-E 971 87 Sweden**

This Research is designed to explore the effects of night shift schedules on nursing personnel working in a private hospital

This study is in fulfillment of the requirement for a Master of Science degree in Industrial Ergonomics.

Instruction

1. Participation to questionnaire is voluntary.
2. All information will be treated with strict confidentiality and will not in any way be used against you.
3. Please read all questions carefully and note that some scales will be reversed.
4. Please complete all questions by ticking in the appropriate column for each question.
5. Please complete all questions before submitting the questionnaire.
6. Information obtained from the study will be used for recommendations.

Personal Data

1. Gender Male Female

2. Age (Please specify in the box)

21 – 30

31 - 40

41 – 50

50 and above

3. Civil Status

Married

Single

Occupational information

4. Occupational Rank

R/N

E/N

E/N/A

5. Present Placement

ICU

OT

Medical Unit

Surgical Unit

Obstetrical Unit

Paediatric Unit

Other Units

6. Present Shift

Day shift

Night Shift

7. Length of period in the present shift

Under one – 3months

4 – 6months

7months and above

8. Did you request for the present shift?

Yes

No

9. Regarding night shift, please tick the most appropriate for you

a. It pays better

b. I prefer night shift it suits my life-style

c. I do not prefer night shift

10. Please tick in one column. The 12hr Night shift is:

Strenuous							Comfortable
-----------	--	--	--	--	--	--	-------------

SLEEP

11. Do you get enough sleep after night work?

Yes

No

I do not know

12. How many hours do you sleep after night work?

Less than 5hrs – 5hrs

6hrs – 8hrs

More than 8 hours

13. After night shift work do you experience any problem to fall asleep?

Yes

No

14. If you need to induce sleep when on night, shift which of the following do you use?

Hot beverages

Alcoholic drinks

Sleeping tablet

Listen to music

Reading

None of the above

WORK PERFORMANCE

15. Nurses carry heavy workload on night – shift than on day – shift.

1. Strongly, agree	2. Agree,	3. Mildly, agree	4. Disagree,	5. Strongly disagree
<input type="checkbox"/>				

16. I have more energy to perform during night shift. Please tick one column

Disagree | | | | | | | | Agree

17. When working on night- shift which of the following do you experience?

More Active	Active	Moderately Active	Tired	Moderately Tired	More Tired
<input type="checkbox"/>					

PSYCHOSOCIAL ASPECT

18. How do you feel about the Night - shift?

Dislike | | | | | | | | Like

19. How do you find your level of concentration when working night shift?

- Almost high
- Normal
- Almost low
- I do not know

20. Does night shift affect your attitude?

- Almost always
- Sometimes
- Almost never
- I do not know

21. Night shift disturbs your social life

Agree | | | | | | | Disagree

HEALTH ASPECT

22. Does night shift affect your health in any way?

- Yes
- No
- I do not know

23. Which of the following do you currently experience?

- Frequent headaches
- Backache
- Persistent tiredness
- Feet ailments
- Loss of sleep
- None of the above

Please specify other ailments/illnesses _____

24. Have you sustained any of the occupational injuries during the last 24 months?

- Needle-stick injury
- Muscular strain
- None of the above

Please specify other type of injury and the shift at the time of injury

Type Shift

THANK YOU FOR YOUR PARTICIPATION.

Please return this form to the Unit Supervisor.

Appendix 5: Checklist for Hospital Facilities

1. Workstation	<i>Good</i>	<i>Poor</i>	<i>Not Applicable.</i>	<i>Action required (specify urgent or not urgent)</i>
Cleanliness				
Lighting				
Ventilation				
Noise				
Housekeeping				
Furniture				
2. Rest room				
Cleanliness				
Ventilation				
Furniture				
Noise				
3. Cafeteria/Canteen				
Cleanliness				
Lighting				
Ventilation				
Furniture for dining & Resting				
4. Bathrooms & Toilets				
Distance from users				
Facility for physically impaired workers				
Cleanliness				
Ventilation				
Accessories				
5. Safety & Security at night				

This checklist has been adapted from the Ergonomic checklist with modifications for the purpose of this survey.

Appendix 6 Tips on How Nurses Cope With Night Shift

Specific Recommendations for Nurses

Researcher: Sizeni Madide

MSc.Student Industrial Ergonomics

Introduction

Studies show that shift workers are vulnerable to sleep deprivation. It has been noted from previous studies that night workers sleep about 1 hour less than day workers, and that night workers' sleep has "poor quality". Night workers accumulate a sleep deficit and sleepy workers make mistakes. The most dangerous are those who build up a "sleep debt" depriving themselves of sleep over long periods. Human body does not function well without proper sleep. This happens because the body's functions are controlled by the circadian rhythms. This rhythm is the biological pattern that tells us to sleep at night, and be active by day.

Tips for Shift workers

Sleeping

1. Plan your sleeping time, keeping a steady schedule.
2. Make and keep rules. Train your children not to disturb you when you are sleeping.

3. Do not work too many nights in a row. At most, not more than four.
4. Develop a good sleeping environment. Have a dark, cool, and comfortable room.
Block out light with heavy curtains or foil.
5. Eye- shades and ear - plugs can be used by those who are comfortable wearing them. Turn telephone volume to off.
6. If under stress, relax before going to bed. One possibility of relaxation is light exercise.
7. Have sleep-prep rituals that promote good sleep. Regularity of preparations will flip your mind switch to “I’m going to sleep”.
8. Beware of your sleep debt. The less sleep you get the more tired and prone to make mistakes you will be.
9. If you have not had enough sleep take short naps to minimize the risks. The co-workers should be made aware of your problem, so that they can assist you by rotating your activities and routine work. Monotonous work can cause drowsiness resulting in mistakes.
10. It is advisable to keep short naps to 20 minutes to avoid getting into deep sleep.
Waking from a deep sleep can make you feel more tired and groggy. Even a 10-minute nap can clear your brain and refresh you before work.
11. A three-hour nap before work is ideal if you did not sleep a full eight hours after night work.

Digestion

12. Watch what you eat and drink. Choose light healthy meals before going to bed.

13. Avoid heavy, gassy, greasy or fatty meals during night shift.
14. Avoid coffee or caffeine at least four hours before going to bed.
15. Herbal teas and warm milk are good before bed.
16. Avoid alcohol, the quality of alcohol – induced sleep is poor and often cause interrupted sleep as one gets up to the bathroom after drinking.
17. Avoid using intoxicants or sleeping pills to get to sleep except in most unusual circumstances: the sleep architecture is altered thus sleep is less restful and you may be hung over with poor performance at work. “It is Habit Forming too”

Social

18. Do not lose your connection with your family life. Do not forget that your family is for whom you do it. Do not lose your spouse or significant other.
19. Meet teachers and help with school activities.
20. Show up unexpectedly at your spouse’s work with flowers and go out to a special lunch when you can (Men). Make your spouse feel the difference that you can be available during hours that conventional worker are not.
21. Grocery shopping at off peak hours will be of benefit.

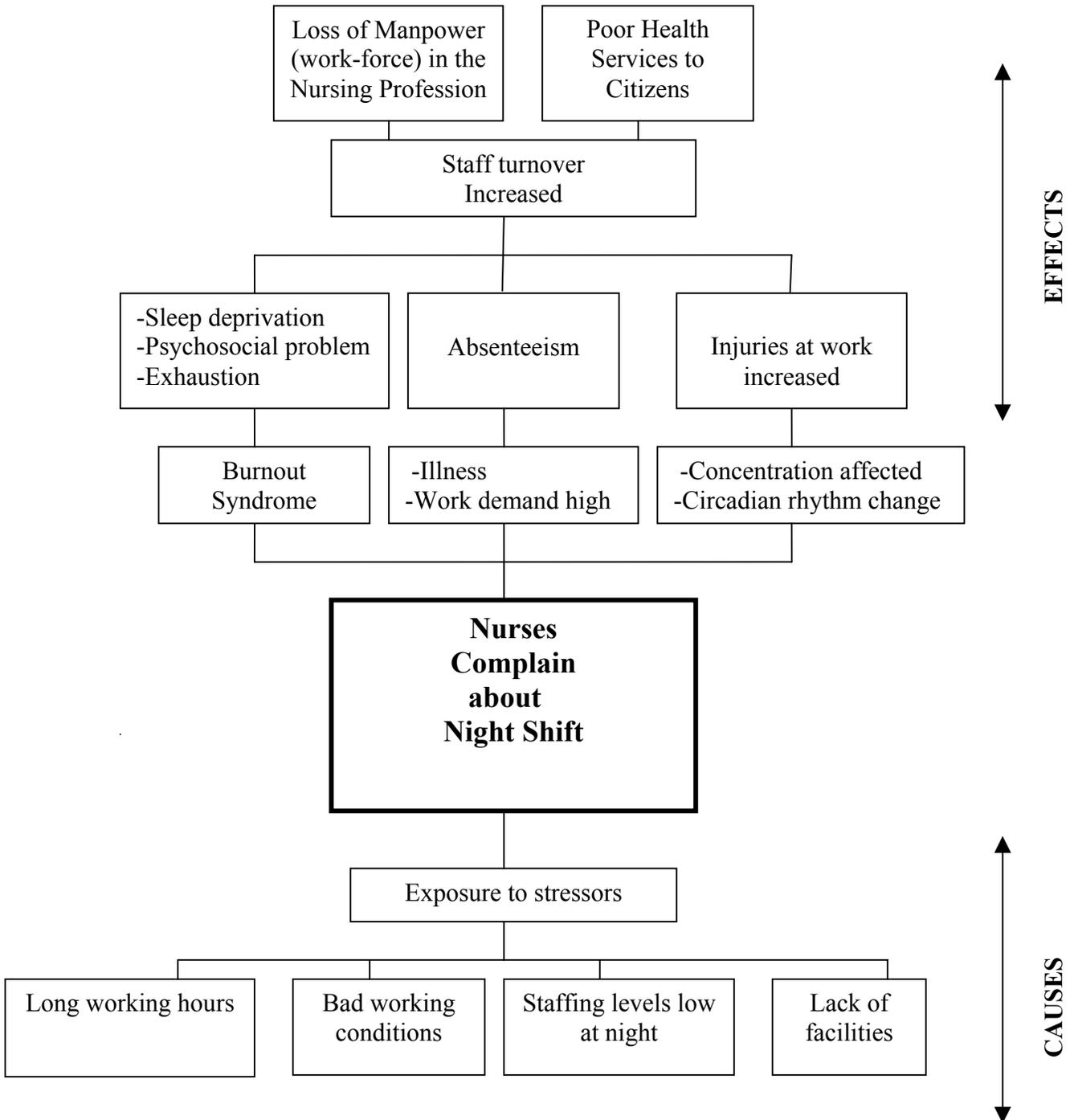
Adapted from (Konż, 1990 & Domrose, 1999 www.nurseweek.com 07.10.02, www.circrdian.com 10.01.03).

APPENDIX 7: Logical Framework Approach (LFA)

PROBLEM ANALYSIS

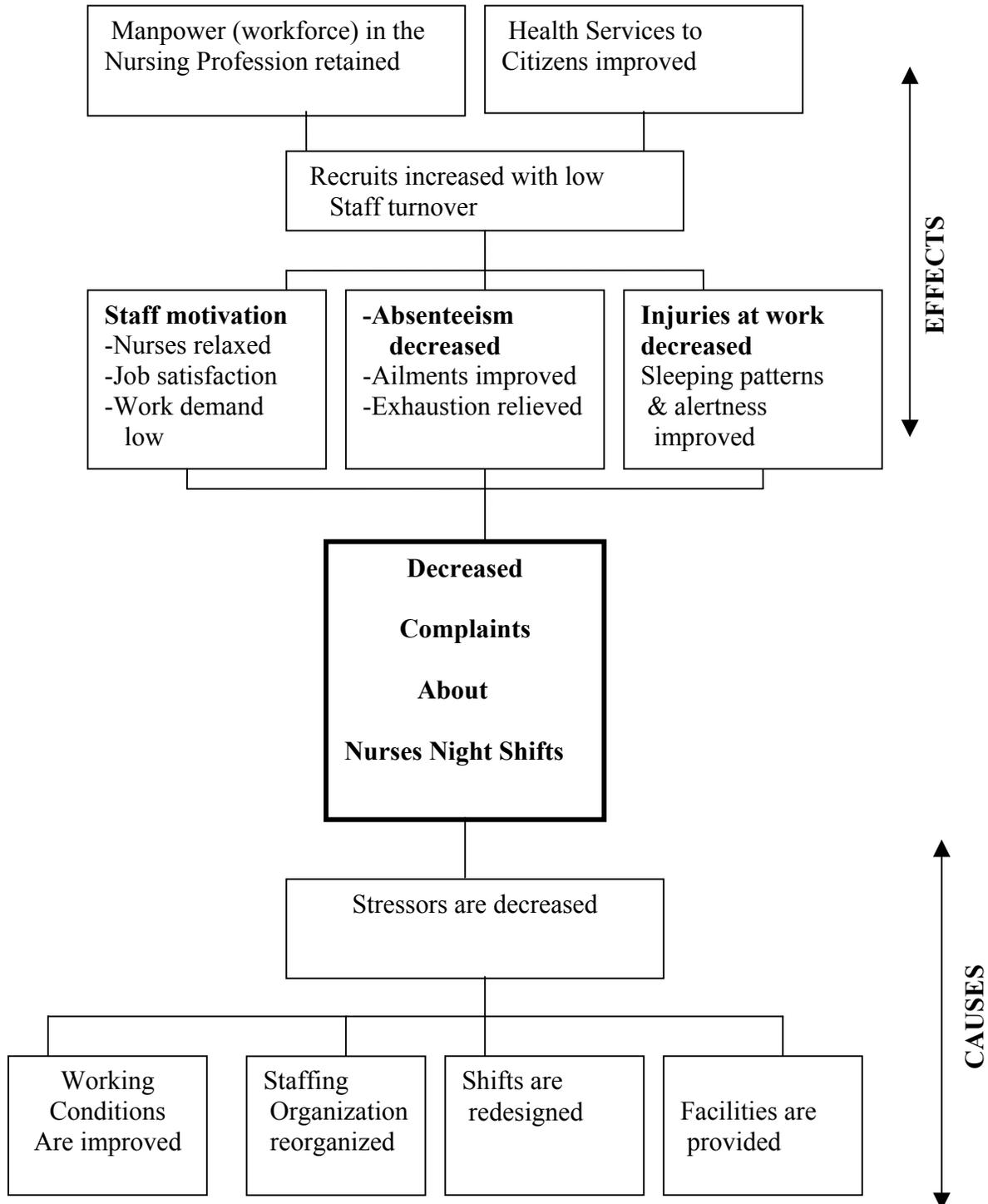
Researcher: Sizeni Madide

Development of the Problem Tree



OBJECTIVE ANALYSIS

Development of Objectives



Logical Framework Approach Matrix

<p><u>1. GOAL</u></p> <p>Working conditions improved for Kwa-Zulu Natal Nurses.</p>	<p><u>INDICATORS</u></p> <ul style="list-style-type: none"> • Recommendations for improvement on completion of the research 	<p><u>ASSUMPTION</u></p> <ul style="list-style-type: none"> • Conditions of work for nurses improved
<p><u>2. PURPOSE</u></p> <p>Night shift nursing personnel complaints reduced in a general hospital in Kwa-Zulu Natal.</p>	<p><u>INDICATORS</u></p> <ul style="list-style-type: none"> • Retrospective and contemporaneous data from year 2000 to July 2002 collected • Collected data indicates most of nurses complaints from year 2000-2002 	<p><u>ASSUMPTION</u></p> <ul style="list-style-type: none"> • All night shift complaints from the nurses identified and addressed • A large number of nurses have complaints regarding night shift
<p><u>OUTPUT</u></p> <ul style="list-style-type: none"> • Undertake workshop for unit managers on night shift . • Review night shift policy with Nurse Managers. • Provide leaflet about prevention of night shift problems to all nurses 	<p><u>INDICATORS</u></p> <ul style="list-style-type: none"> • Night shift complaints for nurses drafted by end of December 2003. • Copy of awareness leaflet available by end of February 2003. 	<p><u>ASSUMPTION</u></p> <ul style="list-style-type: none"> • Change in shift schedules is accepted by all nurses and managers

<u>ACTIVITIES</u>	<u>INPUTS</u>	<u>ASSUMPTION</u>
<ul style="list-style-type: none"> • Conduct meeting with the Hospital Nursing Manager. • Conduct meeting with the focus group. • Questionnaire design for interview of the Nursing Division Hospital Manager, Trade Union for nurses. • Interview Nurse Manager of the hospital. • Workplace tour to observe the facility • Observe target group work facility using ergonomic checklist • Questionnaire design for the target group • Conduct a pilot study • Administer questionnaires to target groups • Obtain adequate data about Night shift Schedules for the target group. • Night shift policy for nursing personnel reviewed. • Obtain data about status of occupational stressors from occupational health clinic or safety officer • Analysis of data 	<ul style="list-style-type: none"> • All Records of meeting with target unit managers and focus groups available at end of January 2003. • Hospital Managers support the research project by July 2002 • Budget to pay for Research activities by Department of Occupational Health by end of November 2002. 	<ul style="list-style-type: none"> • Hospital Financial Managers taking long time to provide budget for necessary funds and facilities. • Food services arranged by the hospital management for night nurses • Eating facilities, rest Room, and other facilities considered by hospital management for night nurses by June 2003