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### An ergonomic study on physiological stress and fatigue of nurses in Nagpur city

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#### Abstract

Nursing profession though is a gratifying profession is extremely challenging. The nurses work conditions lead to physical and emotional exhaustion. The presence of stress and exhaustion among nurses occur due to different reasons including overtime and involving physical and mental symptoms due to the work they perform, with work overload and lack of time even to rest. Nurses need to be free from occupational stress and maintain good health. The main purpose of this study is to investigate the relation between nurse's working stress and the patient care behaviours as well as nurse's health related quality of life. It was a descriptive- cum - experimental research conducted at three hospital which were viveka, G. T. Padole and ciims Hospital. A total of 50 sample of nurses were taken. A purposive random sampling was done to select the sample for the study. Observation Method was also used for analysis. After the study, we found that 54% of nurses had worked in special care department and maximum i. e., 78% nurses experience tiredness type of fatigue while doing their work. Also, after study we found that most of the nurse's reduced communication skills were the effects of fatigue and relationship at their workplace. Significant difference was found in job stress level among married and unmarried nurses. But as compared to unmarried nurses, married nurses showed a tendency towards being more stressed. It can be concluded from the study that any work organisations (Hospital) should assess each workstation factors which is impacting their employees (Nurses) health. A through evaluation must be performed in relation to employees health factors, work area design, shift work, and working hours particularly since all variables have a significant relationship with workplace stress outcomes. An ergonomically designed working environment can reduce human resource problems, including fatigue, physiological problems like high blood pressure and pulse rate and job dissatisfaction.

**Keywords:** Nursing profession, physiological stress, fatigue, nurses

#### Introduction

Nurses are responsible for treatment and safety of patients, recovery of extremely sick patients and treatment of patients requiring palliative care. A person visits a hospital with the belief that he/ she will be taken good care of by the nurses. Nurses are trained to consider Patient's quality of care and life but seldom their own. Nurses learn to accept health problems that come from the physical and emotional demands of their profession. While the health of nurses is important to nurse them, it is also important for the quality of care they provide to their patients. Scientists Olufsen, Bengtsson, and Brink (2003), in their research, have shown that most of the nurses are facing stress related disease. When an individual attempts to minimize the negative feeling arising from a negative event, this is considered as coping process. Coping is usually of two types, emotion- focused and problem- focused. The problem- focused coping is external, in which an individual attempts to manage or change the problem causing the stress. Whereas in emotion- focused activities, coping attempts to alleviate emotional distress, which may be internally directed. Research on nurses has indicated that workplace stress among nurses, leading nurses to quit job, resulting in mental and physical disorders, spoiling occupational relations, and affecting nursing care quality and job dissatisfaction.

The current labour conditions involve production and service models with accelerated and intensified work characteristics. The models determine increased productivity, through the combination of the work rhythm, responsibility burden and reduction of rest intervals in the work journey. These facts can lead to a progressive occupational risk trend, which can give rise to chronic effects in the workers' health. In that sense, the work journey represents an important dimension of the job quality, affecting the occupational safety and health, in the

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personal and family aspects as well as in the work organization inside the institution.

The work journey can turn into an element that causes exhaustion and suffering for the workers; when the organizational context triggers suffering, individuals aim to develop defence mechanisms to try and reduce it. In case of increased conflicts and deadlocks between the workers and the organization, however, when they are no longer able to give an outlet to their desires and creative/inventive processes, they end up getting ill and the organizational environments can become stressful for the workers. On the other hand, work is a form of being for humans and they can get remuneration and satisfaction through their work, avoiding or mitigating stress situations.

Stress can be acute or chronic, and the consequences of high chronic stress levels are perceived through absenteeism, productivity drop, demotivation, interpersonal difficulties, different physical illnesses, depression, anxiety, and unhappiness in the personal sphere. In the work sphere, the consequences of stress can also include low spirits, lack of involvement with work and the organization, frequent absences and delays, excessive visits to the medical clinic and medication dependence.

In nursing work, the concern with these professionals' suffering and pleasures emerges, arousing questions about how they can bear exhausting situations, mainly due to the constant contact with suffering, pain, death and so many other feelings and reactions the disease process triggers. Nursing has worked to attend to human beings and, therefore, gain knowledge and scientific principles that support their practice. Nevertheless, the nurses' work conditions lead to physical and emotional exhaustion.

Stressed nurses are more susceptible to the occurrence of work-related accidents and diseases and can also develop their activities inefficiently, certainly resulting in negative consequences for the attended individuals and/or population. In addition to this problem, there is the large hour load the health workers, including the nursing professionals, tend to accomplish, making them work excessively.

### **Purpose of the Study**

Stress is manifested in physiological, psychological, and organisational forms. All these finally impact workplace performance, leading to poor organisational and physiological effects such as absenteeism, job turnover, poor organisational climate, and reduced productivity to meet the physical and emotional demands of nurse's profession. Nurses need to be free from occupational stress and maintain good health. The main purpose of this study is to investigate the relation between nurse's working stress and the patient care behaviours as well as nurse's health-related quality of life. That's why the need was felt to study on this particular topic.

### **Objectives**

1. To study the physiological stress (in terms of Blood pressure, Pulse rate, Heart Rate, Vo2 Max) among respondents.
2. To identify physical fatigue experienced by the nurses during their working hours.

### **Limitation**

- This study was conducted in Nagpur city only.
- The sample size was fifty (50) only.
- Only female subject was chosen for the study.

### **Methodology**

A description- cum - experimental Research was used to study on physiological stress and fatigue of nurses in Nagpur city. Interview schedule was used to gather the information by preparing Questionnaire. Blood pressure monitor and pulse oximeter was used to get the experimental data for the study. Questionnaire was comprised of the Questions related to physiological stress in terms of blood pressure, pulse rate, heart rate, Vo2 max and physical fatigue experienced by the nurses. The study was carried out in three hospitals of the Nagpur city such as viveka Hospital (26), G.T. Padole Hospital (10), and crims Hospital (14), etc. A Total of 50 sample was taken for the description and experimental data collection. A purposive random sampling was done to select the sample for the study. Data was collected from the sample by using questionnaire. The description data was collected by preparing questionnaire on google form and experimental data was collected by personally going to the hospital. Observation Method was also used to collect some of the data. Frequency, percentage, tables, diagrams and chi square test was applied to analyse the data.

### **Results**

In this study, it was found that almost all the nurses used to provide health counselling, administering medication, wound care, health interventions during their shift duty. They were also coordinating in surgery during their shift. It was also observed that heart rate of the nurses varied from 65 to 95 bpm during their duties. Pulse rate was also found between the same range as in heart rate. The data envisaged that the blood pressure of the nurses ranged from 100/60 mmHg to 135/90 mmHg during the period of their shift. The total cardiac cost of work was also calculated which showed maximum when the nurses were engaged doing wound care and health intervention treatment. Physiological cost of work in terms of energy expenditure was maximum during coordination with health care team in surgery. Nurses had experienced various types of fatigue while doing their work. Tiredness was in terms of deprived of sleeping, irritability in eyes, mental tiredness, lack of motivation, depression, boredom etc. Because of this, nurses had very negative effect on work place. it was found that they had reduced decision making ability, reduced communication status, reduced productivity and performance, reduced ability to handle stress on the workplace etc.

### **Conclusion**

It can be concluded from the study that any work organisations (Hospital) should assess each workstation factors which is impacting their employees (Nurses) health. A thorough evaluation must be performed in relation to employees health factors, work area design, shift work, and working hours particularly since all variables have a significant relationship with workplace stress outcomes. An ergonomically designed working environment can reduce human resource problems, including fatigue, physiological problems like high blood pressure and pulse rate and job dissatisfaction.

### **Recommendation**

1. Ergonomics problems can be reduced by doing Exercise, yoga, meditation and by adopting the healthy lifestyle.
2. Proper sleeping is very important to control your blood pressure, pulse rate and other type of physiological disorders.

3. Some of the ergonomic problem can be reduced by reducing the use of mobile phone and screen.

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