

## **Chapter 3**

### **MATERIAL AND METHODS**

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#### **Statement of the problem**

Psycho-behavioral determinants affecting quality of life of staff nurses posted in critical vs. non-critical units.

#### **Objectives of the Study**

The variables of the research was studied with reference to staff nurses working in the Himalayan Institute of Medical Sciences, Dehradun with the following objectives:

1. To find out baseline differences in Psycho behavioral determinants of Staff Nurses posted in critical and non-critical units.
2. To find out baseline differences in Quality of life of Staff Nurses posted in critical and non-critical units.
3. To find the effect of change in posting on Psycho-behavioral determinants among Staff Nurses posted in critical units.
4. To find the effect of change in posting on Quality of Life among Staff Nurses posted in critical units.
5. To find the effect of change in posting on Psycho-behavioral determinants among Staff Nurses posted in non-critical units.
6. To find the effect of change in posting on Quality of Life among Staff Nurses posted in non-critical units.

## **Hypotheses**

The hypotheses have been grouped in accordance to the objectives of the study.

1. H<sub>0</sub> Staff nurses posted in critical units will not differ in their mean scores of sub scales of MBI-HSS than those posted in non-critical units.
2. H<sub>0</sub> Staff nurses posted in critical units will not have difference in value of heart rate (HR), galvanic skin response (GSR) and skin temperature than those posted in non-critical units.
3. H<sub>0</sub> Staff nurses posted in critical units will not differ in mean scores of domain wise quality of life than those posted in non-critical units.
4. H<sub>0</sub> Staff nurses posted in critical units will not differ in mean scores of overall quality of life and overall health than those posted in non-critical units.
5. H<sub>0</sub> Staff nurses posted in critical units when shifted to non- critical units will not differ in mean scores of MBI-HSS sub scales of burnout.
6. H<sub>0</sub> Staff nurses posted in critical units when shifted to non- critical units will not differ in mean score of heart rate, galvanic skin response (GSR) and skin temperature.
7. H<sub>0</sub> Staff nurses posted in critical units when shifted to non-critical units will not differ in mean scores of quality of life-physical, psychological, social and environmental domain.
8. H<sub>0</sub> Staff nurses posted in critical units when shifted to non-critical units will not differ in mean scores of overall quality of life and overall health.
9. H<sub>0</sub> Staff nurses posted in non- critical units when shifted to critical units will not differ mean scores of MBI-HSS sub scales of burnout

10.  $H_0$  Staff nurses posted in non- critical units when shifted to critical units will not differ in mean scores of heart rate, galvanic skin response (GSR) and skin temperature.
11.  $H_0$  Staff nurses posted in non- critical units when shifted to critical units will not differ in mean score of quality of life - physical, psychological, social and environmental domain.
12.  $H_0$  Staff nurses posted in non- critical units when shifted to critical units will not differ in mean score of overall quality of life and overall health.

## **Research Approach**

In this study, quantitative research approach was used as the researcher's aim to study the impact of different work setting on psycho-behavioral determinants and quality of life of staff nurses and the effectiveness of a change in posting from critical to non-critical units and vice versa to reduce psycho-behavioral determinants and improve quality of life of staff nurses.

## **Research design**

Experimental research design was used for the present. Schematic representation of research design is shown in figure-1

## **Variables of the Study**

The followings are the selected variables in the present research work:

1. Independent Variable: Critical and non-critical units

2. Dependent Variable:

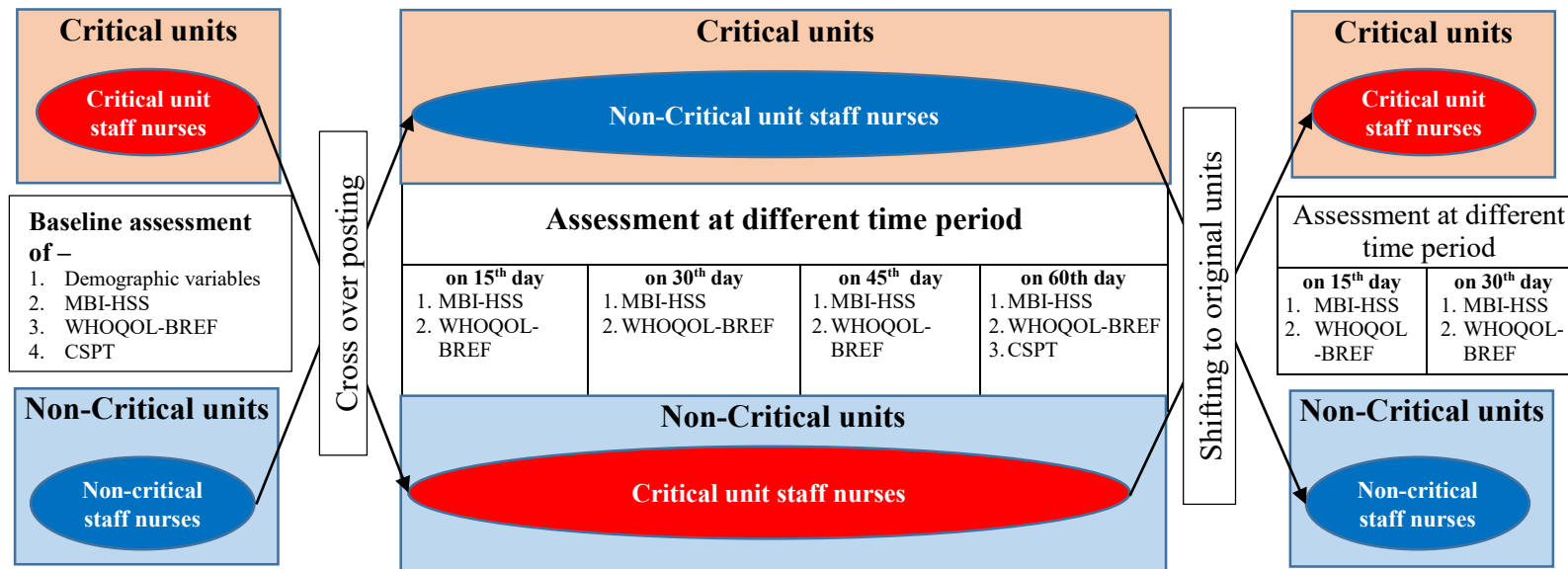
2.1 Psycho-behavioral determinants-

a) Burnout level of staff nurse

b) General adaptation syndrome- a physiological response to stress

among staff nurses: heart rate, galvanic skin response (GSR), and skin temperature.

2.2 Quality of life of staff nurse



**Figure 1: Schematic representation of research design**

KEY:

1. MBI-HSS: Maslach Burnout Inventory-Human Service Survey
2. WHOQOL-BREF: World Health Organisation Quality of Life
3. CSPT: Computerised Stress Profile Test

## **1. Independent Variable: Critical and non-critical units**

**Critical unit** – it includes units in hospital where the patient is highly dependent on the nurse for their nursing care which requires continuous close observation of health status, hourly vitals monitoring or as required, advance nursing intervention and evaluation during a stay in a health facility.

**Non-critical unit** – it includes units in hospital where the patient is partially dependent on the nurse for their nursing care which does not require close observation of health status, more than 4 hourly vital monitoring, basic nursing intervention and evaluation during a stay in a health facility.

In the present study critical and non-critical units were categorized based on acuity category scores. The rating was from 1 to 4, where 1 indicate the lowest acuity and 4 indicates the highest acuity. In the present study, units with patient's acuity category 1 and 2 were classified as non-critical unit and units with patient's acuity category 3 and 4 were classified as critical units (Harper & McCully, 2007; Kidd, Kimberly Grove, Melissa Kaiser, Swoboda, & Taylor, 2014).

## **2. Dependent Variable:**

### **2.1 Psycho-behavioral determinants:**

In the present study the psycho-behavioral determinants are the assessment regarding psycho-behavioral response of Staff Nurses to their workplace environment which results in burnout and general adaptation syndrome - physiological response to stress among staff nurses.

a. **Burnout:** a psychological reaction to work related stress. It is a syndrome which includes emotional exhaustion, depersonalization and personal accomplishment measured by the Maslach Burnout Inventory-Human Service Survey (MBI-HSS). Emotional exhaustion (EE): it measures feelings of nurses being emotionally overextended and exhausted by their work and expressed in term of burnout scores (0-52) which is further arbitrary categorized as low level ( $\leq 18$ ), average (19-26) and high level of burnout ( $\geq 27$ ).

Depersonalization (DP): it measures an unfeeling and impersonal response of nurses toward their own nursing care, service, treatment, management plan, or instruction to patients and expressed in term of burnout scores (0-30) which is further arbitrary categorized as low level ( $\leq 5$ ), average (6-9) and high level of burnout ( $\geq 10$ ).

Personal accomplishment (PA): it measures feelings of competence and successful achievement in one's work towards providing nursing care and expressed in term of burnout scores (0-48) which is further arbitrary categorized as low level ( $\geq 40$ ), average (39-34) and high level of burnout ( $\leq 33$ ).

b. **General adaptation syndrome- a physiological response to stress among staff nurses:**

General adaptation syndrome (GAS) is based on Selye's model (Selye, 1950) which has three stages describe the body's response to stress:

**Stage 1: Alarm:** upon encountering a stressor, the body reacts with "fight-or-flight" response and sympathetic nervous system is activated. An increase in blood pressure (BP), heart rate (HR), and respiratory rate (RR).

**Stage 2: Resistance:** Although, during alarm the phase, enough chances are given to overcome from stressors and stressful situation. Sometimes, stressful situation or stressor remains constant and unchanged, than individual goes into the resistance Phase. When a person stays in a high- overwrought alarm stage for a prolonged period, is not favorable for the good health and physiology of the body. During this stage, people try to stay calm, keep off their emotions, do not accept the problems and isolate self from others.

**Stage 3: Exhaustion:** In the third stage of general adaptation syndrome, a person becomes exhaustion. If the stressors persist for long duration in second stage and body lost resources in multiple attempts to overcome from the problem and to repair, it goes into the next stage, which is known as exhaustion stage. At this stage, if threats or stressor continued for an extended period, body shows signs and symptoms of exhaustion and results into emotional trauma.

Hence, the physiological markers of PBD, which changes in response to the felt threat and pressure of environment. In present study researcher have included the following components of sympathetic nervous system which are the significant bio markers of physiological response of PBD-

- **Heart Rate**
- **GSR (Galvanic Skin Response)**
- **Skin temperature**



**Heart Rate:** As per the National Institute of Health (NIN), the normal resting heart rate for adults (including seniors) is 60 - 100 beats per minute. Heart rate is managed by two factors: internal and external controls. Internal regulation of heart rate is regulated by cardiac tissue/muscles, which is a unique property of cardiac muscles (AHA, 2017).

External control of heart rate regulation is mainly upon hormonal and nervous system. The heart rate regulating centre is placed in the medulla. Further, it is regulated with sympathetic and parasympathetic components which arises from ANS. Sympathetic component increase, and parasympathetic response decrease the heart rate. Activation of sympathetic component helps in releases catecholamines (epinephrine & norepinephrine). Acetylcholine is produced in response to parasympathetic activation. Sympathetic and parasympathetic, jointly regulates heart rates. The heart rate is influenced by multiple factors such as age, sleep, gender, environmental condition, drugs, emotions, food, etc.

Emotions play a large role in heart rate response. Anger, fear, and anxiety cause tachycardia (>100 beats per minute) whereas, sadness, love, happiness can result in reducing heart rate. Heart rate remains high in emotional stress condition (Jayanthi, Nivedha, & Vani, 2015).

**GSR (Galvanic Skin Response):** The Galvanic Skin Response (GSR) produced from the conductivity in the dermal layer which is also known as electrodermal responses (EDRs). The moment a person experiences an emotional reaction or changes in socio-environmental condition, human body react to these changes which also results into fluctuation in electrical conductivity of human skin Jayanthi et al. (2015).

GSR is a recording of electrical resistance, which can be measured by applying a weak electric current between 2 electrodes positioned on the palm at 1 inch distance. GSR value changes according to the emotional condition of a person. During emotional arousal, there is a variation in peripheral autonomic tone, which changes perspiration and blood flow in the skin, and these changes are reflected in GSR values.

**Skin temperature:** Normally, skin temperature of human remains constant at 98.6°F (37 °C) with minimal fluctuation between 35.8 and 38.2 °C, to maintain a balance between heat loss and production. In the human body, different body parts differs in temperature. The maximum temperature can be recorded in the brain and body viscera, this is known as core temperature. Whereas, skin has minimum temperature, which is known as peripheral temperature. The core temperature is maintained at a constant level, to regulate this the peripheral temperature varies by heat exchange with blood. (Vinkers et al., 2013).

It was found that, during emotional stress the ANS remains continuously alert, which is interceded by an amplified action of the sympatho-adrenomedullary system. These response results in raising blood pressure and heart rate, and cutaneous vasoconstriction. As there is a decreased blood supply in the peripheral area can cause declined finger temperature (Vinkers et al., 2013).

## **2.2 Quality of life of staff nurse**

Quality of life is a self-perception about his or her routine life. It is an evaluation of individual's well-being in term of physical, psychological, social and environmental aspects of life.

In the present study, the quality of life of nurse refers to an experience and the feelings of his or her situation in life with regards to the socio-cultural, and value system in which they live with the aim, hope, and standards of their life. Quality of life is a wide concept which is influenced by interconnected state of physical health, mental or psychological health, social health and relationship with their environment (WHO, 1996)

## Setting of the study

The study was conducted at Himalayan Hospital, Dehradun. It is a tertiary care level, 750 bedded teaching Hospital of Uttarakhand state. Furthermore, critical and critical units were selected based on patient's acuity category and tool (Harper & McCully, 2007; Kidd et al., 2014).

**Current acuity tool:** It has four rating options ranging from 1 to 4. Here, one represents the lowest level of acuity and four represent the highest level of acuity. Evaluation of rating are depends on time duration to complete the nursing intervention, how much physical energy required, intensity of emotional care and support, skills required, repetition of the task and how frequent re-assessment is required for the specific nursing activity.

The scores to be given in all 5 types of categories, all the scores are summed up to get a score for every client, the obtained score comes between 1 to 60.

All the inpatient units were surveyed, units which scored category 1 and 2 were defined as non-critical units and units in score category 3 and 4 were defined as critical units. The following units were included in the present study under critical and non-critical categories:

**Table 1: Critical and Non-critical units**

Critical units	Non-critical unit
1. ICU (intensive care unit)	1. Male medical
2. CCU (cardiac care Unit)	2. Female medical
3. CTVS Unit (cardio-thoracic vascular surgery)	3. Pulmonary medicine
4. PACU (Post anaesthesia care unit)	4. Orthopaedic
5. IMCU (Inter-mediate care unit)	5. Oncology ward-medicine
6. NICU (Neonatal intensive care unit)	6. Oncology ward-surgery
7. Emergency unit	7. General surgical
8. Neuro-ICU (Neuro intensive care unit)	8. General paediatric
9. Observational unit	9. Gynaecological

## **Population**

The population represents the entire group under study. In this study, the population was the Staff Nurses. The target population was drawn from critical and non-critical units based on inclusion and exclusion criteria, at Himalayan Hospital, Dehradun.

## **Sample and sampling**

The sample for the study were staff nurses posted in critical and non-critical units in shift duty. Sample size calculation was done on the basis of findings from a previous study considering subscales of Maslach Burnout Inventory (MBI-HSS) - Emotional exhaustion (EE) as a main parameter (Ozden, Karagözoğlu, & Yıldırım, 2013). A difference between the groups of more than 20-30% will be considered as a practical significant. Using  $\alpha=0.05$  (Two Tailed) and  $\beta=80\%$ , researchers found the minimum required sample size to be 48 staff nurses in each group.

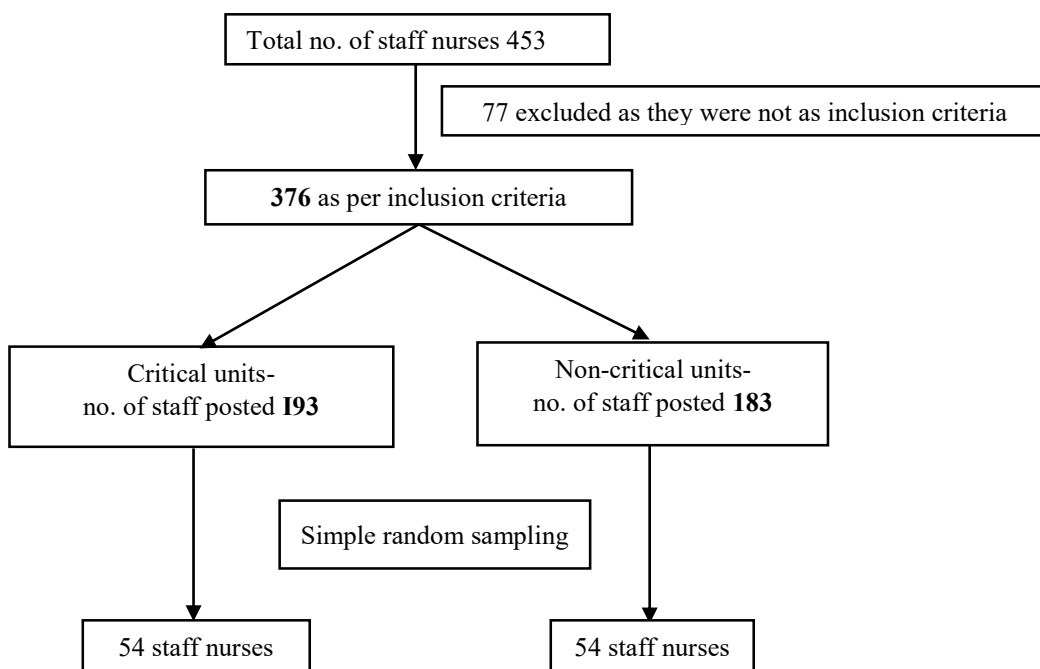
The sample size was calculated and found to be 84 staff nurses, 48 each from Critical and Non-critical units. To avoid short of sample size from 96 due to dropout of participant during the study, researcher increase sample size up to 108.

The data about nurses working in the Himalayan Hospital was collected from the university administration. A total 453 registered nurses working, based on sampling criteria 376 staff nurses were obtained as the target population. Among 376 staff nurses, 193 were posted in critical units and 183 were posted in non-critical units.

In present study staff nurses were selected by simple random technique (lottery method). Every month 9 nurses from critical units and 9 nurses from non-critical units were selected randomly (figure 2). There were 8 study participants who dropped out during study with various reasons (not willing, left the job, medical problem, long leave).

**Formula**

$$n = \frac{(\alpha + \beta)^2 (SD_1^2 + SD_2^2)}{d}$$



**Figure 2: Schematic representation of sampling technique**

**Inclusion criteria:**

1. Minimum 1 year of work experience as a staff Nurse.
2. Staff nurse working in shift duty.

**Exclusion criteria:**

1. Pregnancy: at the time of interview, female nurses was asked about pregnancy status. Also, nurses were communicated that, during the data collection period if become pregnant, they should inform to the researcher.
2. Presence of any chronic illness which makes difficult in daily routine work in the patient care unit/ward.
3. Staff nurse who has submitted resignation notice.
4. Any administrative issue that does not allow the staff nurses to shift in other unit for the period of 2 months (e.g. short staffing, change in the role of staff such as from shift duty to general duty).
5. If any staff nurse, after inclusion, remains away for more than 7 days from work place due to long leave/absent/resigns/leaves institute during the study period will be dropped from the study.
6. Unwilling to join in the study.

## **Data collection tools**

The data were collected with the help of following tool and instruments:

- A. Demographic proforma
- B. MBI-HSS
- C. WHOQOL-BREF
- D. Computerised Stress profile test (CSPT)

**A. Demographic proforma:** Demographic proforma (Appendices-2) comprises personal & professional information, e.g.; age, gender, marital status, profession of spouse, number of children, salary, number of dependent on salary, financial responsibility, type of family, present and past history of smoking/alcohol, staying in campus or off campus, distance to work place, mode of transport, education qualification, years of professional experience, duration of work experience in present units, daily average number of patient assignment, and suffering from health problems.

**B. Maslach Burnout Inventory - Human Service Survey (MBI-HSS):** The MBI-HSS was developed in 1981 and in the present study 3<sup>rd</sup> edition (revised 2013) is used. The MBI-HSS is a copy right©1996 and revised on October 2013, Christina Maslach & Susan E. Jackson for which author took permission to use from mind garden.com (Appendices-4). In this questionnaire 22 statements are written about personal feeling. It is self-administered questionnaire which takes 10 to 15 min of time to complete. In the copyright letter, it was written not to publish the whole questionnaire, hence the MBI-HSS questionnaire is not given in Appendices-3 completely.



Nurses were given an empty score sheet paper and asked to write a number between “0 to 6” (never to everyday) in front of each question statement. This is prepared a Likert type six-point scale in the English language which was designed to evaluate the three aspects of the burnout syndrome: emotional exhaustion, depersonalization and lack of personal accomplishment.

The emotional exhaustion (EE) subscale measures experience and feeling of a person about his or her work, the person feels that the work is emotionally straining and made him exhausted. The depersonalization (DP) subscale measures the insensitivity, improper response and inhuman toward his patient while providing nursing care. The personal accomplishment (PA) subscale assess experience and feel good about his/her work. When a nurse provides nursing care, at the end of the day, how much they feel that they have done a good job for the betterment of his or her patient. Also, it is a perception of his or her own skills and competencies while delivering nursing care or performing a procedure.

**Scoring-** it is a continuous rating scale, ranging from low to moderate to high degrees of experienced feeling. The MBI-HSS contains 22 statements which are divided into three subscales, each subscale is consist of different question. A high mean score of EE and DP subscale reflects a high degree of burnout. Whereas, low mean scores on personal accomplishment (PA) subscale indicated to high level of burnout. The possible maximum to minimum mean score was from 132 to 0 (zero). The following is the categorization of MBI-HSS with numbers of questions and their scorings-

**Table 2: Categorization of MBI-HSS scores**

MBI subscale	No. of questions	Range of experienced burnout		
		Low	Average	High
Emotional exhaustion (EE)	9	≤18	19-26	≥27
Depersonalization (DP)	5	≤5	6-9	≥10
Personal accomplishment (PA)	8	≥40	39-34	≤33

**C. WHOQO- BREF:** The WHOQOL-BREF (Appendices-5) is a standard tool, constructed by World Health Organization (WHO) to check domain wise quality of life. The WHOQOL-BREF consists of a total 26 five-point Likert scale questions gives a summary of quality of life. It is possible to derive four domain scores, namely physical health, psychological status, social relationship and environmental domains. In addition to this, it also examined overall QOL and perception of health. In each domain higher scores denote a higher level of QOL.

**Scoring:** The score of each question in the domain is computed collectively. Every question plays a significant role in the final score of each domain. Each question on scale gives a direction, whether the question is framed in positive or negative direction. Three facets, Q3, Q4, and Q26 were negatively formed which need to be reverse scored (1=5, 2=4, 3=3, 2=4 and 1=5) remaining facets were scored as 1=1, 2=2, 3=3, 4=4 and 5=5. The possible maximum to minimum mean score was from 130 to 26. Computation of domain scores was performed as per guidelines of the WHOQOL-BREF (WHO, 1996).

**D. Computerised Stress Profile Test (CSPT):** The computerised stress profile test (CSPT) measures components of autonomic nervous system, namely the heart rate, GSR, and skin temperature. The heart rate, GSR, skin temperature were recorded on a digital polygraph (Medicaid system, Chandigarh, model no. AADFM4260DXMOOI) in the Lab at Himalayan Hospital.

**Scoring:** The mean scores of Math Phase, Verbal phase, Ruler phase, Unpleasant phase, and Gazing phase were added together and an average mean score was generated.

Mean scores were compared between critical units staff nurses and non-critical units staff nurses. A higher mean score of heart rate, GSR and lower mean scores of skin temperature denotes stress among staff nurses.

## **Content validity**

The questionnaire used are already internationally acceptable and validated by respective organisations.

### **I. Maslach Burnout Inventory - Human Service Survey (MBI - HSS):**

*Convergent validity:* Convergent validity (Maslach, Jackson, & Leiter, 1981, Revised 2013) was confirmed in three ways. The MBI-HSS score was rated by self and, then the findings were correlated with the scores rated by a person who know that individual well (e.g., family member, co-worker). Second, the characteristics of certain profession which can add or produces burnout was correlated with the scores of MBI-HSS. Third, different hypothesized questions related to burnout were correlated with scores of MBI-HSS

Correlation data for convergent Validity of MBI-HSS was obtained by author in his/her research studies were as following:

#### *External validation of personal experience (peer rating)*

Among Mental health workers (n=40):

Higher Emotional Exhaustion: emotionally drained by job (0.28\*), physically fatigue (0.41\*\*)

Higher Depersonalisation: emotionally drained by job (0.56\*\*\*), physically fatigued (0.55\*\*\*), complaint about clients (0.32\*)

#### *Personal outcomes*

Nurses, social services, mental health workers (n=180)

Higher Emotional Exhaustion with less growth (-0.24\*\*\*)

Higher Depersonalisation with less growth satisfaction ((-0.47\*\*\*)

Higher personal accomplishment with more growth satisfaction (0.41\*\*\*)

*Nurses, social services, mental health workers (n=180)*

Higher Emotional Exhaustion with less co-worker satisfaction (-0.16\*)

Higher Depersonalisation with less co-worker satisfaction ((-0.41\*\*\*)

Higher personal accomplishment with less co-worker satisfaction (0.40\*\*\*)

NOTE: All p values are two-tailed. \*p < .05, \*\* < .01, p < .10

The MBI-HSS was tested using confirmatory factor analysis (R. T. Lee & Ashforth, 1993) confirmed the three factor model of burnout with a confirmatory factor analysis based upon three composite score indicators for each of the three subscales.

They found the EE, and DP factors to be different, but significantly correlated, and both the subscales were greatly correlated with measures of physiological and psychological strain than was PA. In contrast, Personal Accomplishment was more closely related to control oriented coping.

*Discriminant validity:* To find the discriminant validity (Maslach et al., 1981, Revised 2013), the association between job satisfaction and MBI-HSS scores supported discriminant validity computed by the author. Work satisfaction had a significant moderate negative correlation with both EE ( $r = -0.23$ ) and DP ( $r = -0.22$ ), as well as a slight positive correlation with PA ( $r = 0.17$ ).

## **II. WHOQOL-BREF**

Confirmatory factor analysis of the WHOQOL-BREF was done based on WHOQOL-100, and described in the manual of the WHOQOL-BREF(WHO, 1996) (World Health Organization 1996).

### III. Computerised Stress Profile Test (CSPT)

Computerised Stress Profile Test was performed at the Himalayan Hospital on digital polygraph-Medicaid system. Details of sensitivity, low and high cut and range of study parameters are given in below table.

**Table 3: Sensitivity and specification of computerised stress profile test machine**

Channels	Sensitivity	Low cut	High cut
Heart rate	1mV	0.2 Hz	15 Hz
Galvanic skin response (GSR)	10K	D.C	3 Hz
Temperature	1°C	D.C	3 Hz

### Reliability

The questionnaire used are already internationally acceptable and validated by respective organisations.

**I. Maslach Burnout Inventory-Human Service Survey (MBI-HSS):** As per Maslach Burnout Inventory Manual (Maslach et al., 1981, Revised 2013), internal consistency was computed by Cronbach's coefficient alpha (n=1,316). Reliability coefficient was computed and found 0.90 for emotional exhaustion, 0.79 for depersonalization, and 0.71 for Personal Accomplishment.

### II. WHOQOL-BREF:

As per WHOQOL-BREF manual (WHO, 1996), reliability was assessed by test-retest method with the interval of 2-8 weeks among 7831 subjects (4644 sick and 3187 healthy person). Correlations value was ranging from .68 to .95 (based on sick or healthy).

### **III. Computerised Stress profile test:**

The reliability of Computerised stress profile test (CSPT) is based on same manufactured instrument (Adhana, Agarwal, Gupta, & Dvivedi, 2016; Turankar et al., 2013).

#### Computerised Stress profile test (CSPT) procedure:

Environment of the Lab: Lab was situated in an isolated place where there was no sound or distraction from hospital crowd. A comfortable chair with arm and foot rest facility and the room temperature was maintained at 24°C.

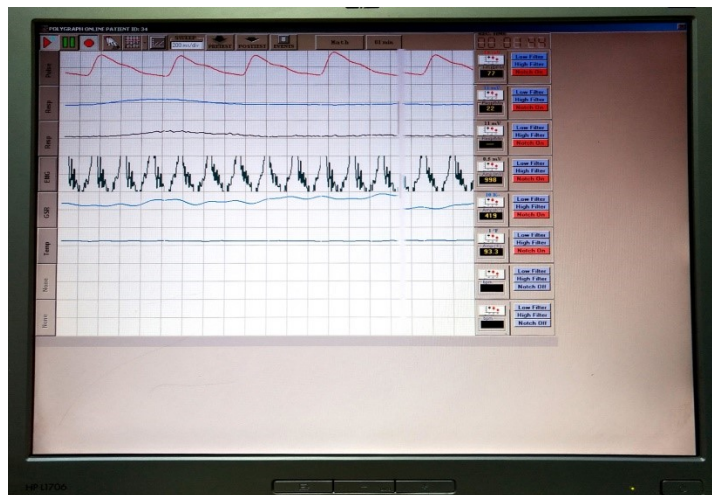
Placement of sensors (figure 3):

- Skin temperature- at 2<sup>nd</sup> finger of right hand
- Galvanic skin response (GSR)- at 1<sup>st</sup> and 3<sup>rd</sup> finger of right hand
- heart rate – at thumb of right hand

To make sure that all the sensors were working, a trail run was tested before starting procedure which is displayed on a computer screen (figure 4)



**Figure 3: Placement of sensors**



**Figure 4: Computerised stress profile test recording**



### **Steps of Computerised stress profile test:**

1. Quit-1 phase: (min 0-1) asked the subject to sit silently. Record a two-minute baseline.
2. Math Phase (min 1-2): after completion of two minutes, initiate a 2-min. mental stressor – mathematics problems progressively increasing in harder to be answered without any help (paper and pen or electronic device). The participant is asked to continually deduct 7 from 100, i.e., “serial sevens”). Following instructions to be given: “In the next 1 minutes, I will be asking you to solve some math problems. Please work as quickly as you can and tell me the answer”.  
  
No comment to be given to participant, whether the answer is right or wrong and No reinforcement to be given (eg., “just do the best you can”) so as not to remove the stress inducing properties of this exercise.
3. Quit-2 phase (min 2-3): Let the participant know that math phase over now tells the subject to sit silently for 1 min.
4. Verbal phase (min 3-4): in this phase subject is given an English language book to read aloud for 1 min. at the end of 1 min. ask to stop reading book.
5. Quit-3 phase (min 4-5): Let the subject know that verbal phase over now tell him/her to sit silently for 1 min.
6. Ruler phase (min 5-6): The subject is asked to sit on a chair with one arm stretched before him and his hand in a semi-flexed position.  
  
The investigator held a 30-cm long plastic ruler at the subject’s eye level, approximately 30 cm above the subject’s semi-clenched fist, and the subject was asked to focus his attention on it. The investigator then dropped the ruler

into the subject's hand, and the subject was asked to try to catch it. This activity was repeated for 1 min.

7. Quit-4 phase (min 6-7): Let the subject know that Ruler phase over now tell him/her to sit silently for 1min.
8. Unpleasant phase (7-8): subject is asked to think about a most unpleasant and traumatic/painful event that they recall well, think event in details. It is not necessary to reveal the thought with the researcher/technician.
9. Quit-5 phase (min 8-9): Let the subject to leave the unpleasant thought now tell him/her to sit silently for 1min.
10. Gazing phase (min 9-10): subject is asked to hold their gaze on a black circular dot on the wall without blinking. The dot was 0.5 cm in diameter and was placed at eye level at a distance of 1 metre from the eyes.
11. Quit- phase (min 10-11): Let the subject know that gazing phase over now tell him/her to sit silently for 1 min.
12. Slow breath (min 11-12): in this phase subject is asked close eye, sit comfortable and take slow & deep breath.
13. Relaxation (min 12-13): ask the subject to continue with deep breaths and sit comfortably.

### **Ethical consideration**

The study was conducted after getting approval from the University Research Committee. Written permission was taken from the Medical Superintendent and Director Nursing of the hospital. Medical and nursing incharges of every unit/ward were informed about data collection program to seek their cooperation. A written consent was obtained from all the respondents who participated in the study. The respondents were given freedom to participate or not to participate. The ethical principles were followed and adhered to protect the rights of the participants. Confidentiality of the data was ensured throughout the study.

### **Data collection procedure**

A pilot study was conducted in the Urban Health Centre of Himalayan Hospital, Rishikesh. The purpose of the pilot study was to pre-test the data collection tools, to find out the feasibility of conducting the study and to decide upon the plan of statistical analysis. The pilot study was conducted from 25<sup>th</sup> May, 2013 to 30<sup>th</sup> September, 2013. Out of 12 nurses, 6 nurses were selected by simple random method. Data was collected as per planned method with use of demographic proforma, WHOQOL-BREF, and Computerised stress profile test. The MBI-HSS was not used because, at that time researcher did not get copyright permission from the author / company. The tools and study design were found to be feasible.

Main study data were collected from 24<sup>th</sup> Oct., 2013 to 30<sup>th</sup> June, 2014 (Appendices-6). Data were collected according to the research design (Figure 1). On every fourth week of month nine nurses from critical units and nine from non-critical units were selected by statistician with simple random technique and made a pair (1<sup>st</sup>

nurse from CU and NCU was a pair) . Selected staff nurses were contacted by the researcher and scheduled to meet all together in next 2 to 3 days in the classroom of holistic department at 10 am, so that their duty schedule should not get disturbs. Nurses were instructed not to drink any kind of beverages (e.g., coffee, tea, cold drink, etc.), smoke, chew tobacco and not to eat anything after 9 am, so the physiological parameters should not alter due to effects of drinks, foods and other substance.

After arrival to the classroom, researchers interacted with nurses in casual talk, so they can be comfortable and diverted their thought process related to family and workplace. All the participants were explained the nature and purpose of the study and those who provided the consent were requested to sign a written consent form (Appendices-1).

At 10.15am they were given an informed consent form, demographic proforma, MBI-HSS and WHOQOL-BREF to fill and followed by briefing about Computerised stress profile test. All the staff Nurses given a schedule for computerised stress profile test (CSPT). The Computerised stress profile test (CSPT) procedure was conducted by a trained technician.

After completion of computerised stress profile test, staff nurse was given the name of the unit in which his/her posting was shifted. All the participants were informed that every 15<sup>th</sup> day they will be contacted to fill the MBI-HSS and WHOQOL-BREF questionnaire and on the 4<sup>th</sup> week of second month the computerised stress profile test will be repeated. After 2<sup>nd</sup> Computerised stress profile test, nurses were informed about re-shifting of their posting to the original unit and continuity in the filling of the MBI-HSS and WHOQOL-BREF questionnaire on the 15<sup>th</sup> day and

30<sup>th</sup> day. The data collection process was terminated after thanking each respondent for their participation and co-operation.

Every month selected staff nurses' names were informed to the office of nursing supervisor and nursing superintendent as well as to the unit in-charge nurse. All the incharge nurses of critical and non-critical units were briefed about study protocol and instructed to give morning, evening, morning and night shift duty respectively to the staff nurses who are posted to their unit under research project. As a protocol, participants were explained about policy and procedures of the unit by the incharge nurse. Internal training and briefing about handling of bio-medical equipment was done by incharge nurse of respective units.

As a part of critical unit's policy, new staff nurse is not given an independent patient assignment during the first 10 to 15 days of posting in critical units. The meaning of independent patient assignment is "a patient is assigned to a new staff nurse with the old staff nurse of the critical unit where a new staff nurse will provide nursing care under the supervision of old staff nurse." Patient assignment to the staff nurses are done by incharge nurse or by a shift incharge nurse.

**Data analysis**

The data collected from participants were coded and entered into Microsoft excel spreadsheet. The data was analysed and interpreted by using descriptive as well as inferential statistics. Qualitative data were analysed and interpreted with the help of narrations, descriptive indexing. Illustrative presentation of data done with the help of tables and graphs. The data was analysed by using the SPSS-21 schedule. However, exact tests that were used in analysing the data are mentioned in respective chapters in the respective sections.