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MENTAL HEALTH STATUS AMONG NURSES IN A TERTIARY CARE HOSPITAL, KOLKATA

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ABSTRACT

Background: The strain caused by occupational differentials among nurses may lead to chronic and acute physiological responses, psychological reactions and Behavioural changes, and a possible decrease in functional capacity and work ability. **Purpose:** The primary focus of this study is to estimate the prevalence of depression, anxiety and stress, and their correlates , in the nursing workforce of Medical College Hospital (MCH), Kolkata, India. **Methods:** Hospital based cross sectional study was conducted at MCH, Kolkata, during the period from April to September, 2015 enumerating all nursing professionals (n=545) with a interviewer administered questionnaire & DASS21; SPSS16 version was used for analysis . **Results:** Workload (history)was a good predictor of depression [AOR= 2.19 (1.10 – 4.38)] , anxiety [AOR= 4.81 (2.32 – 9.94)] and stress [AOR= 6.84 (3.83 -12.21)] respectively when adjusted with relevant variables. **Implication:** NCD risk factors emerged as significant contributors to Mental health status; so nurses, if necessary, should make change to their life style to ensure a good work-life balance

KEYWORDS: Workload, Depression, Anxiety, Stress.

INTRODUCTION

The history of nursing spans from the history of human kind. Nursing has been called the oldest of the arts and the youngest of the profession. The word nurse evolved from the Latin word nutritious, which means nourishing. Nursing is a major component of the health care delivery system and nurses make up the largest employment group within the system .[1] Health care must connect most meaningfully to the patient, and the nurse is almost always part of the last mile (the final step in delivering a product or service to customers). Organizations must, of course, be patient-focused, but this may be considered that the most important proxy for patient-focused care is excellent internal customer service for nurses, since they are involved in nearly every aspect of direct patient care.[2] Another condition of concern in the nursing population includes the physical and emotional complications from stress. Many nurses work in stressful environments, taking care of everyone else before taking care of themselves. The physical effects of stress can include insomnia, gastric ulcers, heart disease, headaches, fertility problems, and eating disorders. Other negative effects include disruption of family life, anxiety, and a reduction in the quality of life.[3] .In addition, the strain caused by work requirements may lead to chronic and acute physiological responses, psychological reactions and Behavioural changes, and a possible decrease in functional capacity and work ability.[4] Strain can also have an immediate effect, namely fatigue. This could be the result of occupational activities that require intense physical and mental activity associated with organizational stressors. Prolonged working hours, night jobs and double shifts stand out among these stressors.[5] Depression is a common mental disorder in some occupational and unemployment sectors. The projection is for depression to become the second most common cause of disability by 2020.[6,7] Women are especially at risk of becoming depressed .[8,9] A recent cross-sectional

study in China examined the prevalence of depression among 1592 nurses. 61.7% (*n* = 886) had mild depressive symptoms and 25.1% (*n* = 222) moderate to severe symptoms.[10] A similar study in South Korea.[11] examined the association between job-related stress, emotive or emotionally arduous work, and depressive symptoms among 441 registered female front-line nurses. Results revealed that approximately 38% of these nurses were experiencing depressive symptom.

There are 15,62,186 registered nurses and midwives in India and 53,169 in West Bengal as on 1/1/2013.It is estimated that only about 40% of the nearly 1.4 million registered nurses are currently active in the country because of low recruitment, migration, attrition and drop-outs due to poor working conditions.[12]

Though several studies indicated mental health morbidity of nursing personnel in connection with their working condition, work organization, job satisfaction, night shifts etc. at international level, but very few studies have been reported at national level and no such study has been reported particularly in West Bengal. The primary focus of this study is to estimate the prevalence of depression, anxiety and stress, and their correlates, in the nursing workforce engaged in a Govt. run tertiary level health care institute.

MATERIALS AND METHODS

This was a hospital based observational, descriptive study in a cross sectional study design, conducted at Medical College Hospital (MCH), Kolkata (88 College Street, Kolkata – 700073, West Bengal, India). The study was carried out in different wards of this hospital during the period from April to September, 2015. Study population was all categories of nursing personnel including Nursing Superintendent, Deputy Nursing Superintendents, Ward Sisters and Staff Nurses discharging services in MCH, Kolkata. Complete enumeration method was employed and final sample size was 545.

One year work experience was the only eligibility criteria and those absenting during the entire period of data collection & unwilling to participate were excluded from the study.

A pre-designed, pre-tested, structured interviewer administered questionnaire measuring socio-demographic , lifestyle & occupational differentials ; portable weighing machine , Stadiometer with a fixed vertical backboard and an adjustable head piece, a non-stretchable measuring tape for anthropometric measurements(weight, height); Stethoscope, aneroid sphygmomanometer and digital glucometer for postprandial blood sugar & blood pressure measurement ; Depression , Anxiety and Stress Score Scale 21(DASS 21) to assess depression , anxiety and stress – were used as study tools and all measurements were performed following standard operating procedures.

After initial preparation the questionnaire was judged by a group of experts in All India Institute of Hygiene and Public Health (AIIH & PH), Kolkata who made necessary corrections. Face validity of each item and content validity of each domain were ascertained by them. Pretesting was done among 30 nursing personnel in another but similar hospital . During pretesting the questions which were found to be irrelevant, ambiguous, not comprehensive were omitted and those questions were required to be added for revealing necessary information according to stated objectives were incorporated.

Current work load (six months) was measured by asking four items of questions like current working place, weekly working hours, monthly night shifts and number of patient attended in last twenty four hours. Maximum and minimum attainable score were 15 and 2 respectively. Median of attained score was taken as cut off to categorize work load(current) as less and more ; respondents obtained ≤ median score were categorized as less work load and those who secured > median score were categorized as more work load respectively.

History of work load during their entire service life was measured through eight domains i.e. total length of service, services discharged in emergency wards, operation theaters, labor room, intensive units, other wards (except emergency), nursing administration and out patient departments. Maximum and minimum attainable score was 40 and 1 respectively. Median of the attained score was taken as cut off to categorize work load (history) as less and more ; respondents scored ≤ to median or > median were categorized as less work load and more work load respectively.

'Travails of travel' was measured by three domains i.e. discharging service from, distance to travel and time taken to reach hospital. Maximum and minimum attainable score was 13 and 0 respectively. Median of the attained score was taken as cut off to categorize 'travails of travel' as present and absent ; respondents scored ≤ to median or > median were categorized as 'travails of travel' absent and present respectively.

Taking necessary permission from the Medical Superintendent Cum Vice Principal , the Nursing Superintendent was consulted to discuss about the study and a suitable time and day in a week was fixed for interview of the nursing personnel so that their routine work schedule and hospital services was not hampered .

All the participants were elaborately explained about the purpose and procedure of the study that this was an academic exercise and they were convinced to take part in the study. They were assured of confidentiality about their identity. Written consent was taken from each subject prior to the interview.

The protocol of the research study was submitted to both the institutional ethical committees (AIIH & PH, Kolkata and Medical College, Kolkata) and after obtaining ethical clearance from both the institute the study was initiated.

Recorded data was analyzed by SPSS 16 version and represented by various tables. Frequency distribution tables were used for descriptive statistics. Effect of different demographic, socioeconomic, occupational differentials, knowledge and precautions of blood borne infection control, BMI, physical exercise, blood pressure (hypertension), blood sugar (≥ 140 mg/dl) on presence of depression, anxiety and stress were elicited separately by univariate logistic regression; multivariable analysis in respect of all the dependent variables were done by considering covariates having irrespective of significant effect in univariate logistic regression (except stress where only significant variables were included).

RESULTS

Mean age of the participants was 37.5 years (± 10.4) with minimum 23 years and maximum 59 years ; more than half (51.9%) had age thirty five years or below; most of the participants (70.1%) belonged to nuclear family ; majority of the respondents (84.5%) belonged to highest socioeconomic class (social class I according to modified B.G. Prasad scale 2015); nearly three fourths (73.9%) of the respondents were married, one fourth (24.2%) were unmarried of which 74.2% (98/132) were newly appointed (length of service was five years or less);more than half (57.1%) of the participants had one children .(Table1)

Average score of work load (current) was 9.2(±2.0) with maximum 13 and minimum 4;less than one third (29.9%) of nurses were more work loaded. Average score of work load (history) was 6.9 (±4.8) with maximum 19 and minimum 2 ; nearly half of the respondents were more work loaded (48.3%). Mean score for 'travails of travel' was 4.8 (±2.8) with maximum 12 and minimum zero ; nearly 60% participants faced 'travails of travel'. More than half (56.5%) of the study subjects were satisfied with their job.(Table1)

Average body mass index was 23.8(± 3.1). One third nurses (33.0%) were overweight and only 1.8% were obese. Considering both stage1 & 2 hypertension, 20.4% suffered from hypertension of which 25.2% (28/111) were undergoing antihypertensive treatment. Only 14.0% of respondents had sugar level between (140 –199) mg/dl and four participants were newly diagnosed diabetic as their PP blood sugar level was ≥ 200 mg/dl.(Table 1)

In depression category more than half (60.5%) were normal, nearly one fourth (23.9%) showed mild symptoms of depression and least (0.7%) had severe symptoms. In anxiety category nearly one fourth (23.7%) were normal, maximum one third (33.9%) showed moderate and minimum (4.8%) of extremely severe symptoms. Considering stress category more than three fourths (78.2%) were normal and least (4.2%) showed moderate symptoms.(Table 2)

In univariate analysis relevant variables had no significant effect on depression .In multivariable analysis when effect of work load (history) was adjusted with covariates like age, marital status, type of family, per capita income, work load (current), travails of travel, job satisfaction & BMI (Hosmer and Lameshow test Non significant, Negelkerke R square=0.023), the effect of work load (history) on depression was significantly augmented [AOR= 2.19 (1.10 – 4.38)] and this model could explain only 2.3 % of dependent variable. (Table 3)

In present study blood pressure had significant effect on anxiety score and respondents who were suffering from hypertension had more prevalence of anxiety [OR : 3.81 (1.92 -7.55)]. In multivariable analyses when blood pressure was adjusted with covariates like , marital status, type of family , per capita income, work load (history), travails of travel, job satisfaction, BMI and blood sugar (Hosmer and Lameshow test Non significant, Negelkerke R square=0.096) , the significant effect of blood pressure on anxiety was significantly augmented [AOR= 4.81 (2.32 – 9.94)] and this model could explain only 9.6 % of dependent variable.(Table 4)

Considering socio-demographic variables, age & having children,both had significant effect on stress and respondents showed higher odds of stress with age above 35 years & having children. [Age: OR : 1.46 (1.02 -2.09) & Having children : OR : 1.78 (1.07-2.97) respectively]. Under occupational differentials domains work load (history) & travails of travel both had significant effect on stress ; more work load(history) and presence of 'travails of travel' had higher prevalence of odds of stress than their counterparts with less workload (history) and absence of 'travails of travel' [Work load (history) OR : 1.71 (1.19 -2.45) ; travails of travel : OR : 1.73 (1.20 -2.48)]. Three NCD risk factors like blood pressure, blood sugar level and BMI had significant effect on stress and respondents who were suffering from hypertension, high blood sugar level and obesity or over-weight showed more prevalence of stress than their counterparts with normal pressure, normal blood sugar level and normal BMI [Blood Pressure: OR: 7.50 (4.72 -11.91) ; Blood sugar : OR: (10.65 (5.98 -18.97) ; BMI : OR : (2.48 (1.71 – 3.59) respectively]. In multivariable analysis, when blood pressure was adjusted with covariate like age, work load (history), travails of travel, BMI, and blood sugar (Hosmer and Lameshow test Non significant, Negelkerke R square=0.334), the significant effect of blood pressure on stress was significantly attenuated [AOR= 6.84 (3.83 -12.21)] and this model could explain 33.4 % of dependent variable.(Table 5)

DISCUSSION

Socio-demographic characteristics

In present study mean age of the participants was 37.5 years (± 10.4) with minimum age 23 years and maximum 59 years and more than half (51.9%) had age thirty five years or below. Only 8.4% of the respondents were on the verge of retirement i.e. between (55-59) years of age group.(Table. 1) In a study[13] conducted by Hilleshein EF and Lautert L at a university hospital in Brazil the average age of nurses was 42.6 years (± 8.5).The mean age was apparently more in the latter. This showed that comparatively younger age group of nurses were engaged in present study. Comparatively less sample size(n=195) and different setting of the later might be the cause for dissimilar findings. In a previous study conducted among nurses working at the two public-sector hospitals in Manisa, Turkey by Nurgul Gungor Tavsanli et al.**[14]**, it was found that 37.9% nurses were in the 28-32 age group in contrast to the present study where 51.9% were in the 23-35 age group; large sample size and different setting of the latter might be the cause for dissimilar results.

In this study most of the participants (70.1%) belonged to nuclear family and 29.9% of joint family. This findings corroborate the present trend that number of joint family is decreasing in manner and nuclear family is gradually increasing. Though nearly 30% of the study subjects belonged to joint family but most of them were unmarried and newly appointed in service.

In current study nearly three fourths (73.9%) of the respondents were married with similar to a previous study conducted among nurses working at the two public-sector hospitals in Manisa, Turkey by Nurgul Gungor Tavsanli et al [14] where 77.0% nurses were married.

In present study more than half (57.1%) of the participants had one children in contrast to previous study conducted in Manisa, Turkey by Nurgul Gungor Tavsanli et al.([14]) where 40.2 % nurses had a child; universality of marriage , early conception , different socio-cultural factors of the two countries might be the possible explanation for these contrast findings.

NCD risk factors

In current study, average body mass index of the respondents was 23.8(± 3.1) with one third (33.0%) of overweight and only 1.8% of obese in contrast to earlier study by Miller SK et al.([15]) where mean body mass index (BMI) of nurses surveyed was 27.2 with 54% of overweight or obese . Different ethnicity & socio-demographic factors might be the reason behind this contrast findings.

In present study 20.4% of nurses suffered from hypertension which was much less than previous study by Urbanetto Jde S et al. ([16]) where the prevalence of hypertension was 32% ; but much more than earlier study by Shailendra Kumar B. Hegde et al.[17] where prevalence of hypertension was 13.7%. Different study setting might be the possible cause for this contrast findings.

Previously 14 nurses suffered from diabetes and during study period, four nurses were newly diagnosed rising total up to 16 (2.9%) which is comparatively less than previous study findings carried out by Shailendra Kumar B. Hegde et al.[17] where prevalence of diabetes was found to be 5.6%. Different study setting might be the reason behind it.

DASS21

In present descriptive cross-sectional study, DASS-21 Standardized Questionnaire was used to obtain depression, anxiety and stress information of the nurses . The test consists of 21 items including three 7-question subscales of depression, anxiety and stress.

One study conducted by Z. Zamanian et al. ([18]) to determine the prevalence of mental disorders among shift work hospital nurses in Shiraz revealed the prevalence of anxiety and depression were (43.2 and 11.2%, respectively). This finding was not similar with the present study finding where prevalence of anxiety and depression was 76.3% and 39.5% respectively ; both anxiety and depression were more in present study.

A descriptive correlational design study by Karanikola, Maria N. K et al.**([19])** with 229 randomly selected members of the nursing staff employed in public and private adult General Hospitals in Greece reported the overall intensity of anxiety symptoms was found to be mild, with 19.9% of the participants experiencing moderate disturbance and 3.9% experiencing serious disturbance intensity of anxiety. This observation was not similar with the present study results where moderate and severe anxiety were 33.9% and 18.9% respectively . Though in previous study , symptoms was measured using Hamilton's scale for anxiety state assessment but the subscale score of anxiety was more in present study.

One descriptive, cross-sectional, correlational study performed by Schmidt D R C et al. ([20]) with the objective to evaluate anxiety and depression among nursing professionals working in Surgical Units including 211 nursing professionals from eleven hospitals of Londrina-Paraná Overall, reported that the workers average score for anxiety was 6.3 and 5.2 for depression in an interval from zero to 21. The current study finding was also not similar with this observation where mean score for anxiety was 5.4 and 3.9 for depression in an interval from 0 to 21. Both mean score for depression and anxiety was less in respect of present study.

Another descriptive cross-sectional study performed by Asad Zandi M et al.[[21] from February 2008 until April

2009 on 272 nurses working in a selected military hospital showed 24.9% rate of depression, 27.9% anxiety and 23.8% stress among military nurses. This finding was also not consistent with the present study finding where prevalence of depression, anxiety and stress was 39.5%, 76.3% and 33.4% respectively.

One previous study by Mostafa A F. et al.[22] on nursing staff at KFMC using Hospital Anxiety and Depression scale (HADS) reported that for anxiety 53% of the study subjects were normal (scores 0-7) and 27% were classified as cause of concern (scores 8-10) while the probable clinical cases (scores ≥11) represented 20%. For depression, 75% were normal (scores 0-7) and 15% were classified as cause of concern (scores 8-10) while the probable clinical cases (scores ≥11) represented 10%. The highest prevalence rate of probable clinical cases of anxiety (23%) was reported among the age group 20 to less than 30 years. While the highest prevalence rate of probable clinical cases of depression (10.9%) was reported among the age group 30 to less than 40 years. This finding was not similar with the present study finding where for anxiety 23.7% of the study subjects were normal, for depression 39.5% were normal and for anxiety 23.7% were normal.

One study by Janda R et al.([23]) to determine the occurrence of posttraumatic symptoms and symptoms of anxiety and depression among nurses in a Czech tertiary hospital showed that among general nurses the most prevalent symptoms were of anxiety (44%), followed by symptoms of depression (15%) and then posttraumatic stress disorder (PTSD) (7%). Similar observation was also found in present study where most prevalent symptoms were of anxiety(76.3%), followed by symptoms of depression (39.5%) and stress (33.4%).

A descriptive correlation study undertaken by Ribeiro R P et al.[24] with 226 nursing personnel from a teaching hospital through application of the Job Stress Scale found that the in relation to anxiety and depression, 154 (68.1%) presented anxiety, with 48 (31.2%) also presenting Metabolic Syndrome; 185 (81.8%) presented depression, of whom 62 (33.5%) also had Metabolic Syndrome. It was ascertained that 61 (27.0%) workers presented stress and that of these, 14 (22.9%) presented Metabolic Syndrome. This previous study finding was also not consistent with the present study findings due to variation in scale.

Depression of the study subjects

In univariate analysis of the present study, relevant variables like age, marital status, type of family, per capita income, having children, workload (current), workload (history), travails of travel, job satisfaction, blood pressure, blood sugar level, body mass index had no significant effect on depression .(Table. 3) Nurses are usually willing to talk about the problems in the profession, such as short staffing, poor ratios, and lack of managerial support. However, what they are not willing to talk about is depression and mental illness in their ranks. Depressed workers often exhibit low mood, have difficulty concentrating and are accident-prone; additionally, they have limited ability to perform mental or interpersonal tasks, struggle with time management and have lower total output than non-depressed workers. Hospital nurses with depression, therefore, are not only likely to suffer individually, their illness is likely to have an adverse impact on their coworkers and, potentially, the quality of patient care.[25] Relevant variables had no significant effect on depression in current study. In multivariable analysis when effect of work load (history) was adjusted with covariates like age, marital status, type of family, per capita income, work load (current), travails of travel, job satisfaction & BMI , then effect of work load (history) on depression (which was found not significant in univariate logistic regression) was significantly augmented [AOR= 2.19 (1.10 – 4.38)] (Table. 3). The above findings of the present study clearly indicated that increased prevalence of depression (as found in univariate logistic regression) was due to work load (history) , but other covariates also played a role.

Anxiety of the study subjects

In present study blood pressure had significant effect on anxiety score and respondents who were suffering from hypertension had more prevalence of anxiety.[OR : 3.81 (1.92 -7.55)] (Table. 4). No other relevant variables had significant effect on anxiety. Psychosocial stressors associated with anxiety disorders raise autonomic arousal via the hypothalamic-pituitary axis which increases circulating catecholamines. This heightened arousal is associated with an increased risk of hypertension and a pro-inflammatory state and, consequently, development of coronary heart disease. This association holds across the spectrum of anxiety disorders (generalized anxiety, posttraumatic stress disorder, panic disorder, and obsessive compulsive disorder) and also when controlling for co-morbid conditions such as depression and physical ailments. Multiple cross sectional studies reveal a positive association between anxiety and hypertension. These associations are bidirectional, with those with hypertension being more likely to have anxiety and those with anxiety being more likely to have hypertension.[154] Similar bidirectional observation was also observed in present study. In multivariable analysis when blood pressure was adjusted with covariates like , marital status, type of family , per capita income, work load (history), travails of travel, job satisfaction, BMI, blood pressure and blood sugar the significant effect of blood pressure on anxiety (which was found in univariate logistic regression) was significantly augmented [AOR= 4.81 (2.32 – 9.94)] (Table. 4). The above findings of the present study clearly indicated that increased prevalence of anxiety (as found in univariate logistic regression) was due to hypertension , but other covariates also played a role. As disease burdens shift from infectious to non-communicable diseases, hypertension is a principal precursor to cardiovascular

diseases and a main cause of death globally. Like patients with other chronic medical conditions, hypertensive patients experience many profound emotions which increase their risk for the development of mental health disorders particularly anxiety and depression.[[26]

Stress of the study subjects

Effect of socio-demographic variables

Considering socio-demographic variables age & having children, both had significant effect on stress and respondents showed higher odds of stress with age above 35 years & having children. [Age: OR : 1.46 (1.02 -2.09) & Having children : OR : 1.78 (1.07-2.97) respectively] (Table.5). Previous study by Nurgul Gungor Tavsanil et al.[15] found significant relationship between age groups and disturbing and adapting life changes. . In earlier studies, a statistically significant relationship was found between age and life events.[27, 28] However, another study reported no statistically significant relationship was found between age and life events.[29] The reason behind the finding of a statistically significant effect occurring with age is thought to be due to the weakness of nurses in coping with stress as they get older, and the stress of the job adding to the burden of their private lives. In present study statistically significant effect of 'having children' was found of the nurses on the life events like presence of stress they had experienced . Disturbing and adapting life changes seemed to have been experienced more by married with 'having children' nurses.

Effect of occupational differentials

Under occupational differentials domains , work load (history) & travails of travel both had significant effect on stress ; more work load(history) and presence of 'travails of travel' had higher prevalence of odds of stress than their counterparts with less workload (history) and absence of 'travails of travel' [Work load (history) OR : 1.71 (1.19 -2.45) ; travails of travel : OR : 1.73 (1.20 -2.48)] (Table. 5). Job stress can be defined as negative emotive and physical responses and occurs when the job requirements do not match with abilities, resources or needs of employees.[30] Psychological factors, in addition to physical, chemical and biological risks at the job environment are the main dangerous factors and job stress is very important among psychological disorders.[31] People who are in health professions, because of being responsible for the health of others are under the pressure of different causes of stress.[32] Nursing is one the stressful professions. The stressful factors in this job have affected nurses in a serious way. Like patients, nurses experience stress too, and some of them cannot adopt themselves with the present stress.[33] For nurses and their organization, job stress is very expensive and its side effects become clear in the form of tiredness, harsh Behaviour, anxiety, increase of blood pressure, lack of self-confidence, lack of job satisfaction, decrease in efficiency.[34,35] According to the studies, stress in nurses can cause depression, isolation from patients, absence and decrease of their qualification.[36] Bailey mentioned work load, care about patients, interpersonal with colleagues, knowledge, skill and tasks of nurses and policies as stressors for nurses.[37] Other studies have mentioned workload, roles and services in units with high work load as sources of job stress in nurses.[38] Similarly the present study established workload (history) as one of the job stressor . In present study 'travails of travel' had a significant effect on stress; that indicated way of transport to reach hospital for attending duties was also a stressor. One earlier study by Freitas EO et al.[39] on nursing students found socio-demographic characteristics as gender, age, relationship status, presence of children and ways of transportation, were factors which can lead to the occurrence of stress. Similarly the current study also identified 'travails of travel' as a factor to the presence of stress among the nursing population.

Effect of NCD Risk factors

Three NCD risk factors like blood pressure, blood sugar level and BMI had significant effect on stress and respondents who were suffering from hypertension , high blood sugar level and obesity or over-weight showed more prevalence of stress than their counterparts with normal pressure, normal blood sugar level and normal BMI [Blood Pressure: OR: 7.50 (4.72 -11.91) ; Blood sugar : OR: (10.65 (5.98 -18.97) ; BMI : OR : (2.48 (1.71 – 3.59) respectively](Table . 5).

Relationship between diabetes and stress is complex. Stress may have a role in the onset of diabetes, in metabolic control and in quality of life. Even though, nowadays, definite conclusions about the role of stress in the onset of diabetes are difficult to reach, there are important evidences regarding the relationships between stress, metabolic control and quality of life in diabetic patients.[40] Physiological effects on the neuro-endocrine system induced by stress can affect directly blood glucose levels .[41] The present study found a significant effect of high blood sugar level (≥140 mg/dl) on stress establishing the earlier study.

The interaction between a genetic background and environmental and Behavioural exposures, such as the excess of salt, fat and alcohol consumption, accounts for most but not all cases of hypertension. Stress has long been listed as a potential and important cause of hypertension.[42] among other potential risk factors such as low potassium consumption, low physical activity and sleep abnormalities. Acute stress can induce transient elevation of blood pressure, but it is still unclear whether this effect results in sustained elevation of blood pressure and hypertension.[43] The current study established the fact and found a significant effect of high blood pressure on stress.

Nurses' work is known to be stressful, and many nurses work shifts. Both stress and shift work are factors that can influence how and what nurses eat and may increase

nurses' risk for weight gain and obesity. Stress is thought to be one of the potential contributing factor to the development and maintenance of obesity.[44] The present study elicited the significant effect of overweight and obesity on stress as founded in earlier study.

In multivariable analysis when blood pressure was adjusted with covariates like age, work load (history), travails of travel, BMI, and blood sugar then the significant effect of blood pressure on stress (which was found in univariate logistic regression) was significantly attenuated [AOR= 6.84 (3.83 -12.21)] . The above findings of the present study clearly indicated that increased prevalence of stress (as found in univariate logistic regression) was due to hypertension, but other covariates also played a role.

The current study makes several important contributions to the Mental health status of nurses working in a tertiary care hospital. Considering the role of work load (history) in causing depression is a relatively new concept and the subject of few empirical investigations to date. Furthermore, this research validates an correlation between blood pressure and work load (history) with anxiety and no such study has been documented so far in India. Finally, the correlation between stress and PP blood sugar level and work load (history) is established in the study which also not investigated so far in India.

However the study is not without limitations. A subjective, recall-based measure (DASS21) of Mental health status was used which could lead to inaccurate reports due to faulty recall bias. Data were collected from the study subjects when they were busy in their work schedule; that might hamper to recall the events occurred in last week on which DASS21 is based upon; this may lead to inappropriate reports also. As convenient sampling was employed so the study subjects were underrepresented in the current sample and the city (Kolkata) from which the data were collected is not nationally representative. All of these factors limit the generalizability of these results.

The present study findings are mostly not consistent with other published works and offer a degree of insight into nurses' Mental health status in Kolkata. Relevant factors associated with depression, anxiety and stress in present study were not similar with other research. Presently, most research have concentrated more emphasis on examining depression/stress or depression and stress but rarely investigated anxiety and its associated factors in nurses. That is why DASS21 was used to measure three dimensions of Mental health status in current study.

RECOMMENDATIONS

The present study findings would make an appeal to the competent authority to take a proactive role in connection with nurses' wellness. in making professional counseling, psychiatric consultation and psychological support, encouraging staff not to suppress their mental health problems but to discuss openly like other health issues removing social stigma, embarrassment, denigration or discrimination.

Nursing administration and hospital authority concerned should strive to create a stress-free working environment where discharging services promote nurses' mental wellbeing to minimize the deleterious effect of stress.
Many relevant interventions like stress management through cognitive-Behavioural therapy, meditations, workshops & awareness campaign, life style modification, suicide prevention may be adopted as educational programs to cope with the issues to strengthen their skills in dealing with stress.

Nursing personnel should be familiar with all resources available in their work and home communities to address any problems and maintain themselves in a state of the best possible mental wellness

Table 1: Distribution of the study participants according to socio-demographic and relevant variables (n=545).

Variables	Category	Number (%)
Age (in years) [Median : 35; IQR (46) ; Mean(SD): 37.5 ± 10.4 , Range: 23 -59]	23 - 35 36-45 46-55 55 -59	283(51.9) 121(22.2) 95(17.5) 46(8.4)
Type of family	Nuclear Joint	382(70.1) 163 (29.9)
Per capita income (in rupees)* [Median: 11,000; IQR: 7500 – 17000, Range: 1500 -85000]	Upper Class Upper Middle Class Middle Class Lower Middle Class	460 (84.5) 78 (14.3) 5 (0.9) 2(0.3)
Marital Status	Married Unmarried Widow Separated Divorcee	403(73.9) 132(24.2) 4(0.7) 2(0.4) 4 (0.7)
Number of living children (n=413)	0 1 2	97 (23.5) 236 (57.1) 80(19.4)

Work load (current) Score : Mean , ± SD : 9.2, ± 2.0 ; Median (IQR) : 10 (8,11) ; Range : 4 - 13	Less (≤ 10) More(>10)	382 (70.1) 163 (29.9)
Work load : (history) Score : Mean , ± SD : 6.9, ± 4.8 Median (IQR) : 5 (2,11) Range : 2 - 19	Less (≤ 5) More (> 5)	282 (51.7) 263 (48.3)
Travails of travel : Score : Mean , ± SD : 4.8, ± 2.8 Median (IQR) : 5 (4,6) Range : 0 - 12	Absent(≤ 5) Present (> 5)	324 (59.4) 324 (59.4)
Job satisfaction	Satisfied Dissatisfied	308 (56.5) 237 (43.5)
Body Mass Index (BMI) [Mean (SD): 23.8, ± 3.1, Range : 16.4 – 36.7]	Underweight (<18.5) Normal weight (18.5 -24.9) Over weight (25 -29.9) Obese (≥ 30)	16 (2.9) 339 (62.3) 180 (33.0) 10 (1.8)
Blood Pressure (mm of Hg) [According to JNC 8 criteria]	Normal Pre hypertension Stage1 Hypertension Stage 2 Hypertension	210 (38.5) 224 (41.1) 102 (18.7) 9 (1.7)
Postprandial Blood Sugar (mg/dl) [n=534]** [WHO recommended diagnostic criteria] [Mean (SD): 120.0 ± 20.0 , Range : 78 -288]	< 140 140 -199 200 - 288	455 (85.3) 75 (14.0)# 4 (0.7)

*According to revised modified B G Prasad socio-economic classification scale 2015
**Eleven (11) nursing personnel were unwilling to undergo postprandial blood sugar estimation
#12 nursing personnel were known diabetic and their PP sugar level fell within this category.

Table 2. Distribution of the study subjects according to depression, anxiety and stress score scale (DASS21) (n=545)

DASS Scale	Depression Number (%)	Anxiety Number (%)	Stress Number(%)
Normal	330 (60.5)	129 (23.7)	363 (66.6)
Mild	130 (23.9)	102 (18.7)	162 (29.7)
Moderate	81 (14.9)	185 (33.9)	20 (3.7)
Severe	4 (0.7)	103 (18.9)	-
Extremely severe	-	26 (4.8)	-

Table 3: Univariate & multivariable logistic regression analysis for effects of factors on depression of the study subjects (n=545).

Variables	Presence of Depression		
	Number (%)	OR (95%CI)	AOR (95%CI)
Socio-demographic :			
Age (in years)			
≤ 35 (262)	106 (40.4)	1	1
>35(283)	109 (38.5)	0.92 (0.65-1.30)	0.55 (0.27 -1.10)
Marital Status			
Unmarried/Separated/ Divorcee(142)	60 (42.2)	1	1
Married (403)	155(38.4)	0.85 (0.57 -1.26)	0.92 (0.58 -1.45)
Type of family			
Joint (163)	69 (42.3)	1	1
Nuclear (382)	146(38.2)	0.84(0.58 -1.22)	0.92 (0.62 -1.36)
Per capita income			
>Rs. 17000(124)	43 (34.6)	1	1
≤ Rs.17000 (421)	172(40.8)	1.30(0.85 -1.97)	0.81 (0.85 – 1.21)
Having children(n=413)			
No (97)	30 (30.9)	1	

Yes (316)	131(41.4)	1.58(0.97-2.56)	-
Occupational differentials:			
Work load (current)			
Less (382)	146(38.2)	1	1
More (163)	69 (42.3)	1.18 (0.81 -1.72)	1.22 (0.83 -1.79)
Work load (history)			
Less (282)	107(37.9)	1	1
More (263)	108(41.0)	1.14 (0.80 -1.60)	2.19 (1.10 -4.38) *
Travails of travel			
Absent (324)	127 (39.1)	1	1
Present (221)	88 (39.8)	1.02 (0.72 -1.45)	0.87 (0.58 -1.31)
Job satisfaction			
Satisfied (308)	115 (37.3)	1	1
Not satisfied (237)	100 (42.1)	1.22 (0.86 -1.73)	1.26 (0.88 -1.79)
NCD Risk Factors:			
Blood pressure			
Normal (434)	168 (38.7)	1	
High (111)	47 (42.3)	1.16 (0.76 -1.77)	-
Body Mass Index			
Normal weight (355)	145 (40.8)	1	1
Overweight/ obese (190)	70 (36.8)	0.84 (0.58 – 1.21)	0.82 (0.56 -1.21)
Blood sugar [mg/dl] (n=534)			
≤ 140 (455)	174 (38.2)	1	-
>140 (79)	37(46.8)	1.42 (0.88 -2.30)	

*significant at 95% confidence interval.

Table 4: Univariate & multivariable logistic regression analysis for effects of factors on anxiety of the study subjects (n=545)

Variables	Presence of Anxiety		
	Number (%)	OR (95%CI)	AOR (95%CI)
Socio-demographic :			
Age (in years)			
≤ 35 (262)	203 (77.4)	1	-
>35(283)	213 (75.2)	0.88 (0.59-1.31)	
Marital Status			
Unmarried/Separated/ Divorcee(142)	114 (80.2)	1	1
Married (403)	302(74.9)	0.73 (0.45 -1.17)	0.73 (0.42 -1.24)
Type of family			
Joint (163)	119 (73.0)	1	1
Nuclear (382)	297(77.7)	1.29 (0.84 -1.96)	1.63 (1.03 -2.59)*
Per capita income			
>Rs. 17000(124)	93 (75.0)	1	1
≤ Rs.17000 (421)	323 (76.7)	1.09 (0.69 -1.74)	1.20 (0.73 – 2.06)
Having children(n=413)			
No (97)	70 (72.1)	1	
Yes (316)	241(76.2)	1.23(0.74-2.07)	-
Occupational differentials:			
Work load (current)			
Less (382)	289 (75.6)	1	
More (163)	127 (77.9)	1.13 (0.73 -1.75)	-
Work load (history)			
Less (282)	221 (78.3)	1	1
More (263)	195(74.1)	0.79 (0.53 -1.17)	0.59 (0.37 -0.95)*
Travails of travel			
Absent (324)	239 (73.7)	1	1
Present (221)	177 (80.0)	1.43 (0.94 -2.16)	1.24 (0.79 -1.93)
Job satisfaction			
Satisfied (308)	230 (74.6)	1	1
Not satisfied (237)	186 (78.4)	1.23 (0.82 -1.85)	1.44 (0.93 -2.22)
NCD Risk Factors			

Blood pressure			1
Normal (434)	315 (72.5)	1	4.81 (2.32 -9.94)*
High (111)	101 (90.9)	3.81 (1.92 -7.55)*	
Body Mass Index			
Normal weight (355)	267 (75.2)	1	1
Overweight/ obese (190)	149 (78.4)	1.19 (0.78 – 1.82)	0.87 (0.53 -1.43)
Blood sugar [mg/dl] (n=534)			
≤ 140 (455)	344 (75.6)	1	1
>140 (79)	65 (82.2)	1.49 (0.80 -2.77)	1.20 (0.62 – 2.30)

*significant at 95% confidence interval.

Table 5: Univariate & multivariable logistic regression analysis for effects of factors on stress of the study subjects (n=545)

Variables	Presence of Stress		
	Number (%)	OR (95%CI)	AOR (95%CI)
Socio-demographic :			
Age (in years)		1	1
≤ 35 (262)	76 (29.0)	1.46 (1.02 -2.09)*	0.48 (0.20 -1.12)
>35(283)	106 (37.4)		
Marital Status		1	
Unmarried/Separated/ Divorcee(142)	39 (27.4)	1.45 (0.95 – 2.21)	-
Married (403)	143 (35.4)		
Type of family		1	
Joint (163)	55 (33.7)	0.97 (0.66 -1.44)	-
Nuclear (382)	127(33.2)		
Per capita income		1	
>Rs. 17000(124)	43 (34.6)	0.92 (0.60 -1.41)	-
≤ Rs.17000 (421)	139 (33.0)		
Having children(n=413)		1	
No (97)	25 (25.7)	1.78 (1.07-2.97) *	-
Yes (316)	121(38.2)		
Occupational differentials:			
Work load (current)		1	
Less (382)	124 (32.4)	1.14 (0.78 -1.69)	-
More (163)	58 (35.5)		
Work load (history)		1	1
Less (282)	78 (27.6)	1.71 (1.19 -2.45) *	1.47 (0.65 -3.32)
More (263)	104 (39.5)		
Travails of travel		1	1
Absent (324)	92 (28.3)	1.73 (1.20 -2.48)*	1.25 (0.80 -1.96)
Present (221)	90 (40.7)		
Job satisfaction		1	
Satisfied (308)	100 (32.4)	1.10 (0.76 -1.57)	-
Not satisfied (237)	82 (34.5)		
NCD Risk Factors			
Blood pressure		1	1
Normal (434)	104 (23.9)	7.50 (4.72 -11.91)*	6.84 (3.83 -
High (111)	78 (70.2)		12.21)*
Body Mass Index		1	
Normal weight (355)	93 (26.1)	2.48 (1.71 – 3.59) *	1
Overweight/ obese (190)	89 (46.8)		1.24 (0.76 -2.00)
Blood sugar [mg/dl] (n=534)		1	
<140 (455)	116 (25.4)	10.65 (5.98 -	1
≥ 140 (79)	62 (78.4)	18.97)*	9.38 (5.05 –
			17.40)*

*significant at 95% confidence interval.

CONCLUSION

The present study identifies significant predictors of Mental health status in nurses. Risk factors include socio-demographic characteristics such as age, having children, type of family; occupational differentials include work load (history) and travails of travel ; NCD risk factors like overweight & obese, blood pressure and postprandial blood sugar level.

NCD risk factors emerged as significant contributors to Mental health status. As life style modification has a key role in controlling NCD risk factors so nurses, if necessary, should make change to their life style to ensure a good work-life balance. In validating the current study findings, in-depth focus group interviews may be conducted to begin to find out the causal relationships the study hypothesize between psychiatric morbidity and personal and professional factors. This may be helpful to initiate a effective strategies formulation for promoting and restoration of good mental health of nurses.

KEY MESSAGES

- Significantly the study brought forward a message that nursing professionals are not free from psychiatric morbidity, specially stress and that was significantly correlated with age, having children, workload (history), travails of travel, blood pressure, blood sugar level and body mass index .
- Mental health status of the nursing professionals should not be neglected but needs to be addressed and prevented with all possible effort emphasizing top priority.
- Intensive mental health research is needed to elicit the mental health needs and way out of fulfilling the same for restoration of optimal wellbeing of the important healthcare workforce.

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