INTRODUCTION

Depression and anxiety are considered most frequent mental disorders in human life.1-3 Nurses appear to suffer more severe mental health problems than other health practitioners and the general population.3,4 Depression, anxiety and stress are the most prevalent mental disorders among nurses.5,6 Mental disorders are found associated with absence from work, intention to leave, and high turnover7,8 and these mental health problems can contribute to occupational accidents and quality of services.9,10 Some studies have measured and reported all three11 and other studies have reported findings separately on stress, anxiety and depression.12-14 Nurses working in nightshift may be at risk for decreased personal health and increased errors in patient care resulting from the cumulative stressful effects of shift work.15 So, this cross sectional hospital based study was conducted to determine the prevalence and influencing factors related to stress among the nightshift working nurses of Hospitals in Katmandu, Nepal.

METHODS

It was a cross-sectional hospital-based study where nightshift working nurses were the study population. Study population was selected on the basis of multistage sampling technique. Data was collected from September 2019 to October 2019. The list of hospitals in Kathmandu city was obtained from the District Health Office and Ministry of Health and Population. Out of total hospitals of Kathmandu, four hospitals (Upendra Devkota Memorial National Institute of Neurological and Allied Science; Nepal National Hospital; BP Smiriti Samudahik Sahakari Hospital and Vinayak Hospital and Maternity Home) were shortlisted for the study by simple random sampling method because of logistics reasons and approached for permission to conduct the study. After the permission was granted, the nightshift working nurses of these hospitals were considered for the study. Moreover, for the selection of nurses from each of the hospital, the attendance register of the nurses was used. A separate list of nightshift working nurses of each hospital was prepared. Nightshift working nurses, willing to participate and present on the study schedule were included in the study. Nurses those were not working as nightshift nurses, reluctant, absent on the study; were excluded from the study population. Sample size was derived by using the formula, \( n = \frac{z^2pq}{e^2} \) (where, \( n \) = required sample size, \( z = 1.96 \), considering 95% CI, \( p = \) prevalence of stress (50%), \( e = \) level of significance).
precision (5%). With the addition of five percent non response rate, the total sample was 206 nurses. Next, Probability Proportional to Size (PPS) method used to determine desired numbers of nurses to be selected from sampled hospitals and finally Simple Random Sampling techniques used to select the nurses for data collection from four sampled hospitals. Globally used structured self-administered Perceived Stress Scale (PSS) was used to assess perceived level of stress among the nightshift working nurses. Perceived Stress Scale (PSS) scores were calculated by reversing responses (e.g., $0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0$) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items. A short 4 item scale was made from questions 2, 4, 5 and 10 of the Perceived Stress Scale (PSS) 10 item scale. Based on globally used structured self-administered Perceived Stress Scale (PSS), 0-13 was considered low stress level, 14-26 was considered moderate stress level and 27-40 was considered high level of perceived stress. Perceived Stress Scale (PSS) was pretested, edited and finalized before data collection. Self administrated Perceived Stress Scale (PSS) was the tool used to collect data and self-administered by respondents. The purpose of the study was explained to the nurses before data collection; written informed consent was obtained from the nurses and ethical approval from Nepal Health Research Council (NHRC). Respondents were instructed to return the questionnaire after completing those. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20. The results were summarized and presented by tables. Percentages, frequency, mean calculated and relevant statistical test has been applied.

RESULTS

Socio-demographic characteristics of respondents

All of the respondents were female nurses and mean age of the nurses was 24.46 years ± 3.771 S.D. Table-1 indicates that out of 206 nurses, most of the nurses (41.3%) were between 22-26 years, 35.4% were below 22 years and remaining 23.3% of nurses were above 26 years of age. Similarly, 70.4% of nurses were unmarried and 29.1% were married. By religion, most of the nurses were Hindu (80.1%) followed by Buddhist (15.5%). Regarding the ethnicity, Chhetri category represents the highest proportion (39.3%), followed by Janjati (36.9%) while the lowest was Brahmin (22.8%). Likewise, 51% of nurses belong to nuclear family, 45% to joint family and only 4% belongs to extended family (Table-1).

Prevalence and level of stress among nightshift working nurses based on PSS

The categorization of stress level has been done based on standard tool of Perceived Stress Scale (PSS). Table-2 showed that out of 206 nurses, large majority (79.6%) of nightshift working nurses had moderate level of perceived stress, followed by low level stress (15.5%) and high level of perceived stress (4.9%).

Table 1: Socio-demographic characteristics of nurses

| Socio-demographic variables      | Frequency (%) |
|----------------------------------|---------------|
| Age (completed yrs)              |               |
| <22                              | 73 (35.4)     |
| 22-26                            | 85 (41.3)     |
| >26                              | 48 (23.3)     |
| Mean age ± S.D                   | 24.46 ± 3.771 |
| Marital Status                   |               |
| Unmarried                        | 145 (70.4)    |
| Married                          | 60 (29.1)     |
| Divorce/separated                | 1 (0.5)       |
| Religion                         |               |
| Hindu                            | 165 (80.1)    |
| Buddhist                         | 32 (15.5)     |
| Christian                        | 9 (4.4)       |
| Ethnicity                        |               |
| Brahmin                          | 47 (22.8)     |
| Chhetri                          | 81 (39.3)     |
| Janjati                          | 76 (36.9)     |
| Dalit                            | 2 (1)         |
| Types of Family                  |               |
| Nuclear                          | 105 (51)      |
| Joint                            | 92 (45)       |
| Extended                         | 9 (4)         |

Table 2: Level of perceived stress among nightshift working nurses

| Level of perceived stress | Frequency (%) |
|---------------------------|---------------|
| Low stress                | 32 (15.5)     |
| Moderate stress           | 164 (79.6)    |
| High stress               | 10 (4.9)      |

Influencing factors and stress among nightshift working nurses

Younger nurses may have less coping skills and capacity than elder and it causes more stress to the younger. Table 3 disclosed that the higher percent of the nightshift working nurses below 24 yrs age group perceived more stress compared with greater or equal to 24 yrs of age group. However, there was no significance association between age of the nurses and perceived stress (p= 0.754), since p- value was more than 0.05.

Table 3. Association between age of nurses and perceived level of stress

| Age of nurses | Perceived level of stress | χ² | p-value |
|---------------|---------------------------|----|---------|
|               | Low N (%) | Moderate N (%) | High N (%) |    |
| < 24          | 6 (60.0) | 108 (58.1) | 7 (70.0) | 0.565 | 0.754 |
| ≥ 24          | 4 (40.0) | 78 (41.9) | 3 (30.0) |    |       |
Long working hours, unequal and overloaded work distribution in hospitals are the factors related to stress among the nurses. Table 4 showed that six out of ten (60.2%) of nurses did more than 8 hours nightshift duties and 39.8% did less than 8 hours nightshift. Majority of the nurses (65.5%) reported that distribution of work was equal but 16.5% of the nurses reported about unequal distribution of work and overloaded (18%) in hospitals.

Long working hours causes overstretch. Study also reveals that the nurses working for greater or equal to 8 hrs have higher proportion of stress compared to working less than 8 hrs. However, Chi-square test disclosed that there was no significance association between working hours of nurses and level of perceived stress (p=0.163) (Table 5).

Table 5: Association between working hours and perceived level of stress

| Working hours of nurse (in a day) | Perceived level of stress | χ²  | p-value |
|----------------------------------|---------------------------|-----|---------|
|                                  | Low (N (%))               |     |         |
| < 8                              | 2 (20.0)                  |     |         |
| ≥ 8                              | 8 (80.0)                  |     |         |

Table 6: Association between sleeping hours and perceived level of stress

| Sleeping hours of nurses (in a day) | Perceived level of stress | χ²  | p-value* |
|-------------------------------------|---------------------------|-----|----------|
|                                    | Low (N (%))               |     |          |
| < 6                                 | 5 (50.0)                  |     |          |
| ≥ 6                                 | 5 (50.0)                  |     |          |

*Statistically significant between sleeping hours of nurses and level of stress

Sufficient sleeping and resting hours are essential to minimize the prevalence of stress among the nurses. So, association between sleeping hours and level of perceived stress has been measured by using Chi-square test. Chi-square test showed that there is significance association between sleeping hours of the nurses and stress (p= 0.013) since p-value was less than 0.05 (Table 6).

DISCUSSION

Stress is an emotional and physical reaction and is caused by imbalance between individual’s priorities and resources. As nurses are concerned, stress among them is prone to take place since they have to perform monotonous and complex nature of task repeatedly. Nursing profession is a highly stressful profession and stress among nursing professionals is becoming a crucial issue in health care delivery system. Factors such as age, marital status, workload, sleeping hours, working hours, procedural injustice, role ambiguity, conflicts in family or at workplace and environment affect mental health and job performance. However, there is a limited research on level of stress among nightshift working nurses in Nepal including developing countries. So, this is cross-sectional hospital-based study was done to assess level of stress and influencing factors among nightshift working nurses of Hospital in Kathmandu, Nepal.

In other countries males are also involved in nursing profession. However, due to various social stigmas attached only females choose this profession in Nepal. The results of this study disclosed that 79.6 percent of the nurses had moderate level of perceived stress, followed by low level (15.5%) and high level (4.9%) of perceived stress. Studies done in Iran, showed prevalence of stress and anxiety among the nurses were at a significant level. Similarly, stress among nurses was reported 18.5 percent in Vietnam, 41.2 percent in Australia, 41.1 percent in Hong Kong and 25.7 percent stress was found among the nurses in Nepal.

Concerning cause of stress, nurses working for greater or equal to 8 hrs have higher proportion of stress and 60.2 percent of nurses did more than 8 hrs nightshift duty, distribution of work was unequal (16.5%) and overloaded (18%). Chi-square test of current study showed that there is significance association between sleeping hours of the nurses and stress (p= 0.013) since p-value was less than 0.05. In associating the variables with the level of stress, the variables like age, working hours have no significant association at the level of p<0.05.

A study done in USA found that 92 percent of the nurses had moderate-to-very high stress levels and 78 percent of them slept less than 8 hours of sleep per night; cross sectional study done in India noted 1% mild stress, 39.5% moderate stress and 59.5% severe stress among the nurses; the higher the job stress scores were, the worse the quality of sleep among the nurses in China; significant correlation was observed between stress and sleep (Spearman Analysis; r = 0.213) in Brazil and 59.3% of nurses experienced moderate level stress, 36.8% severe, 2.4% experienced very severe stress in Goa of India. Based on these review, it is clear that the results of current study is found compatible with previous studies; however finding of this study were not well-matched with some of the previous results because of variances in study design, sampling method, data collection tool and age of the respondents.
CONCLUSION

Large majority (79.6%) of nightshift working nurses had moderate level of perceived stress, followed by low level stress (15.5%) and high level of perceived stress (4.9%). So, moderate, level stress among nightshift working nurses in Hospitals of Kathmandu, Nepal is found alarming. There is significance association between sleeping hours of the nurses and stress. Longer hours of working in nightshift, shorter hours of sleeping, unequal and overloaded duty were the main factors related to higher rates and severity of self-reported stress among nurses, which seeks immediate attention. This finding has also some clear implications for mental health policy and for hospital management. There is urgent need to develop workplace mental health policies, workplace mental health promotion programs and effective supports within workforces for nurses experiencing significant mental health problems. These developments are essential for improving quality of services and safety of patients and staff in high-pressure environments in hospitals.

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REFERENCES:

1. Mental Health Foundation. Starting today: The future of mental health services [Online]. Mental Health Foundation. 2013. [LINK]
2. Tsaras K, Papathanasiou IV, Vus V, et al. Predicting factors of depression and anxiety in mental health nurses: A quantitative cross-sectional study. Med Arch. 2018; 72(1):62-67. [DOI]
3. Jamali J, Roustaei N, Ayatollahi SMT, Sadeghi E. Factors affecting minor psychiatric disorder in Southern Iranian nurses: A latent class regression analysis. Nurs Midwif Stud. 2015;4:e28017. [DOI]
4. Cheung T, Yip PSF. Depression, anxiety and symptoms of stress among Hong Kong nurses: A cross-sectional study. Int J Environ Res Public Health. 2015;12:11072–100. [DOI]
5. Letvak S, Ruhm CJ, McCoy T. Depression in hospital-employed nurses. Clin Nurs Spec. 2012;26(3):177–82. [DOI]
6. Hämmig Oliver, Brauchli Rebecca. Bauer GF: Effort-reward and work-life imbalance, general stress and burnout among employees of a large public hospital in Switzerland. Swiss Med Week. 2012;142:w13577. [DOI]
7. Adler DA, McLaughlin TJ, Rogers WH, Chang H, Lapitsky L, Lerner D. Job performance deficits due to depression. Am J Psychiatry. 2006;163:1569–76. [DOI]
8. Tsai FJ, Huang WL, Chan CC. Occupational stress and burnout of lawyers. J Occup Health. 2009;51:443–50. [DOI]
9. Suzuki K, Ohida T, Kanae Y, Yokoyama E, Miyake T, Harano S, Yagi Y, Ibuka E, Kaneko A, Tsutsui T, Uchiyama M. Mental health status, shift work, and occupational accidents among hospital nurses in Japan. J Occup Health. 2004;46:448–54. [DOI]
10. Kawano Y. Association of job-related stress factors with psychological and somatic symptoms among Japanese hospital nurses: effect of departmental environment in acute care hospitals. J Occup Health. 2008;50:79–85. [DOI]
11. Kaur G, Tee GH, Arieratnam S, Krishnapillai AS, China K. Depression, anxiety and stress symptoms among diabetics in Malaysia: A cross-sectional study in an urban primary care setting. BMC Fam Pract. 2013;14:69. [DOI]
12. McNeely E. The consequences of job stress for nurses’ health: Time for a check-up. Nurs Outlook. 2005;53:291–9. [DOI]
13. Katayama H. Relationship between emotional labor and job-related stress among hospital nurses. Nihon Eiseigaku Zasshi. 2010;65:524–9. [DOI]
14. Saunjoo LY, Jeong-Hee K. Job-related stress, emotional labor, and depressive symptoms among Korean nurses. J Nurs Scholarsh. 2013;45:169–76. [DOI]
15. Uprety S, Lamichhane B. Mental Health in Nepal. A Publication of Health Research and Social Development Forum (HERD), Kathmandu, Nepal. [LINK]
16. Cohen, S., Kamarck, T., and Mermelstein, R. A global measure of perceived stress. Journal of Health and Social Behavior. 1983, 24(4), 385–396. [DOI]
17. Esmail Khodadadi, Mina Hosseinzadeh, Roghaye Azimzadeh and Marjeneh Fooladi. The relation of depression, anxiety and stress with personal characteristics of nurses in hospitals of Tabriz, Iran. International Journal of Medical Research & Health Sciences. 2016, 5, 5:140-148. [LINK]
18. Thi Thu Thuy Tran, Ngoc Bich Nguyen, Mai Anh Luong, Thi Hai Anh Bui, Thi Dung Phan, Van Danh Tran, Thi Huyen Ngo, Harry Minas and Thuy Quynh Nguyen. Stress, anxiety and depression in clinical nurses in Vietnam: A cross-sectional survey and cluster analysis. International Journal of Mental Health Systems.2019,13:3. [DOI]
19. Shamona Maharaj, Ty Lees, and Sara Lal. Prevalence and Risk Factors of Depression, Anxiety, and Stress in a Cohort of Australian Nurses. Int J Environ Res Public Health. 2019, 16(1): 61. [DOI]
20. Teris Cheung, Siu Yi Wong, Kit Yi Wong, Lap Yan Law, Karen Ng, Man Ting Tong, et al. Depression, Anxiety and Symptoms of Stress among Baccalaureate Nursing Students in Hong Kong: A Cross-Sectional Study. International Journal of Environmental Research and Public Health.2016, 13(8):779. [DOI]
21. Silwal M, KoiraI D, KoiraI S and Lamichhane A. Depression, Anxiety and Stress among nurses during Corona lockdown in a selected teaching hospital, Kaski, Nepal. Journal of Health and Allied Sciences. 2020,10(2):82-87. [DOI]
22. Timothy R. Jordan, Jagdish Khubchandani and Michael Wiblishauser. The impact of perceived stress and coping adequacy on the health of nurses: A pilot investigation. Nursing Research and Practice.2016, Article ID 5843256. [DOI]
23. Rajeswari. H and B. Sreeleka. Stress among nurses in a tertiary care hospital. The International Journal of Indian Psychology. 2016, 3(2):155-164. [DOI]
24. Xuexue Deng, Xuelian Liu, Ronghua Fang. Evaluation of the correlation between job stress and sleep quality in community nurses. Medicine. 2020, 99(4): e18822. [DOI]
25. da Rocha MC, de Martino MM. Stress and sleep quality of nurses working different hospital shifts. Rev Esc Enferm USP 2010; 44(2):279-85. [DOI]
26. Vernekar S. P, Shah H. A study of work-related stress among nurses in a tertiary care hospital in Goa. International Journal of community medicine and public health. 2018, 5(2):657-661. [DOI]