Pakistan
Journal of Biological Sciences

Prevalence of Mental Disorders among Shift Work Hospital Nurses in Shiraz, Iran

[1]Z. Zamanian Ardekani, [1]H. Kakooei, [2]S.M.T. Ayattollahi, [3]A. Choobineh and [1]G. Nasle Seraji
[1]Department of Occupational Health, School of Health, Medical Sciences/University of Tehran, Tehran, Iran
[2]Department of Biostatistics, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran
[3]Department of Occupational Health, School of Health, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract: The present study was conducted to determine the prevalence of mental disorders among shift work hospital nurses in Shiraz. One thousand one hundred and ninety five nurses from 12 general hospitals were investigated by Persian version of General Health Questionnaire-28 (GHQ-28) as screen tool. Using a checklist, structured observations were made to assess working environment. Selecting a score of 6 in GHQ-28 as cut-off point, 45.4% of nurses were found to suffer from mental disorders and this was more common among females. Similarly, anxiety and somatic symptoms were more prevalent than other types of mental disorders (43.2 and 34.5%, respectively). The prevalence of depression and social dysfunction were 11.2 and 79.5%, respectively. Shift work was significantly associated with anxiety ($p<0.05$). Likewise, marital status was significantly associated with depression and social dysfunction ($p<0.001$). It was concluded that the mental health pattern in hospital nurses was similar to that of general Iranian population as the referent population. However, the prevalence rates of social dysfunction, somatisation and anxiety symptoms among the nurses were higher than the referent population.

Key words: Hospital nurses, mental disorders, GHQ-28, shift work

INTRODUCTION

Health care services provide a continuous service around the clock, for the benefit of all citizens in any country. In most health care systems, nurses are the largest working group and play a major role in the system's success. As health care providers, nurses are obliged to work during day and night to cater for needs of sick people. This can only be possible if nursing services are provided around the clock. Today, medical science and technology development, rapid patient turnover and rising dependency of professionalism in nursing have increased the complexity and volume of nursing care. For this reason, the nursing profession is increasingly characterized by occupational stress, frequent job turnover and job dissatisfaction (Hawley, 1992). It is to be noted that nurses are particularly prone to mental health problems compared with those who are engaged in other types of jobs because they work night or irregular shifts more often, which affects the circadian rhythm and disturbs other biorhythms, leading to failure of various physiological functions (Fujiwara, 1992). Studies have shown that shift-work has negative impact on job performance, sleep, physical and emotional health, social and family life, drug use and level of job-related stress

(Brown-DeGgne, 1998). Night work has also been associated with emotional health, social life and mental health disturbances (Iwata and Egashira, 1997; Mori and Kageyama, 1995). Research has shown that shift work, in particular night work, can have negative effects on health, safety and well-being of nurses (Monk et al., 1997; Akerstedt et al., 1982; Eastman, 1992). The recent studies have found that the likelihood of error increases when nurses are under abnormal pressure of work, or when the working capacity is reduced because of fatigue (Suzuki et al., 2004). These negative effects have consequences not only for individual, but also for the workplace, as decreased alertness and reduced job performance could endanger human lives (Brown-Degne, 1998). Estryn-Behar et al. (1990) in a study conducted on the stress at work and mental health status among female hospital workers concluded that the evidence of association between work involving an existing cumulating of stress factors and mental wellbeing necessitated consideration in interventions aimed at improving working conditions of hospital workers.

The present descriptive cross-sectional study which was a part of quasi experimental study aimed to extend research on Shiraz hospitals nurses' mental health to determine mental disorder prevalence estimates,

Corresponding Author: Z. Zamanian Ardekani, Department of Occupational Health, School of Health,
Medical Sciences/University of Tehran, Tehran, Iran Tel: 0098 711 7251001-8 Fax: 0098 711 7260225

investigate wide range of mental disorders among nurses and identify associations among specific socio-demographic variables and mental disorders.

MATERIALS AND METHODS

Study location and subjects: In this study, names and addresses of all governmental and non-governmental hospitals of Shiraz were prepared. All hospitals were visited. The objectives of the study were explained for the managements of the hospitals and the head nurses to obtain their agreement. In each hospital, a list of all registered nurses was prepared by the head nurses and given to the researchers. Then, copies of a questionnaire as the collecting data tool were distributed among the nurses in the corresponding list.

The nurses were asked to fill out the questionnaire if they agreed to participate. From 1396 registered nurses employed in all 12 hospitals in Shiraz, 1195 nurses including 1064 female and 131 male partook in this study. Since high percent of the registered nurses participated (85.6%), the results of this study could be generalized to all nurses of Shiraz hospitals. Data were collected from September to October, 2006.

Data collection: The 28-item General Health Questionnaire (GHQ-28) was used as a self administered screening tool for detection of mental disorders. This questionnaire was developed by Goldberg and Hillier (1979) for screening somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. It has been widely used in many countries in clinical and nonpsychosis mental disorders (Adachi *et al.*, 1999; Fagin *et al.*, 1995; Gage and Leidy, 1991; Holland, 1996; Hunter and Houghton, 1993; Schreuders *et al.*, 2007; Spelten *et al.*, 1993). Studies on the validation of the GHQ-28 in different countries have demonstrated its high validity and reliability as a screening tool for mental disorders in the community (Ross *et al.*, 1988; Lykouras *et al.*, 1996; Failde *et al.*, 2000).

In this study, Persian version of General Health Questionnaire (GHQ-28) was used. Noorbala *et al.* (1999) reported that the sensitivity specificity and overall misclassification rate of the Persian version of GHQ-28 were 84.7, 93.8 and 82%, respectively, for a cut-off point of 6. Each item was scored based on a 4-point scale (i.e., always to never). Regarding to the interclass correlation between the test-retest scores (0.85), for each subscale cut-off point 6 and for total score cut-off point 23 were applied in the present study (Moayedi, 2005). By this means, those scoring 6 or above were designated as possible case of mental disorder. This survey was approved by the Ethics Committee of Tehran University of Medical Science, prior to its commencement.

In each hospital, the Persian version self-administrated GHQ-28 was distributed among all nurses and collected by the nursing center director. The participants were assured that the personal information would be treated with complete confidentiality.

Statistical methods: Upon completion of field survey and data collection, data was coded and transferred into the computer for further analysis. Statistical analyses were performed using SPSS version 11.5.

Two sample t-tests were used to determine the factors that affect mental disorders. Mental disorders were considered as dependent variables and gender, education, marital status, shift work and type of hospital were considered as independent variables.

RESULTS AND DISCUSSION

Demographic variables: The mean (SD) age of nurses was 30.81 (7.08) years; 89.04% of the participates was female and 10.96% was male. One thousand and seventy three of the nurses studied (89.79%) worked on rotating shift system and 122 nurses (10.21%) worked on fixed shift (day time). The mean (SD) job tenure of the nurses in the current hospital was found to be 7.28 (SD = 6.83) years. 50.46% of the participants were married and 62.85% worked in non-governmental hospitals (Table 1).

GHQ-28 Questionnaire results: The results of the GHQ-28 Questionnaire indicated that 45.4% of the nurses studied suffered from some form of mental disorders. It was more common among females than males. As shown in Table 2, the percentage of those who scored between

Table 1: Some personal details of the nurses who participated in the study (n = 1195)

Gender (%)	Female/Male	89.04/10.96
Age (years)	M (SD) range	30.81(7.08) 19-60
Marital status (%)	Unmarried/Married	41.17/50.46
Job tenure (years)	M (SD) range	7.28 (6.83) 1-39
Working schedule (%)	Rotating shift/Fixed daytime	89.79/10.21
Type of hospital (%)	Governmental/	15.37/
	Nongovernmental	62.85
Education (%)	Diploma	13.5
	Associated diploma	2.18
	B.Sc.	83.68
	M.Sc.	0.84
Daily working time (h)	M (SD), range	8.3 (2.25), 8-18

Table 2: Distribution of GHQ-28 scores (n = 1195)

Score	Frequency (%)
0-22	652 (54.6)
23-84	543 (45.4)
Total	1195 (100)

0-22 points (considered to be mentally in good health) was 54.6%; the remaining 45.4% scored 23 to 84 points (considered to be mentally in poor health). As indicated in Table 3, nurses scored highest on the social dysfunction subscale (mean = 8.89, SD = 3.42), followed by the anxiety symptoms sub scale (mean = 6.44, SD = 4.48).

Mean and standard deviation of subscales (including, depression, anxiety, somatisation, social dysfunction and mental disorders) based on gender, marital status; shift working and type of hospital are depicted in Table 4. As shown in this Table 4:

- Mental disorders were more prevalent among female nurses as compared to male nurses (p = 0.002)
- Mental disorders were significantly higher in married than their single individuals (p = 0.0001)
- Social dysfunctions were more common among married nurses compared to the singles. In contrast, depression was more frequent in singles (p = 0.01)
- Somatic and anxiety symptoms were significantly higher in nurses of governmental hospitals as compared to nurses of nongovernmental hospitals (p = 0.0001)

Table 3: Mean and standard deviation of subscales score as studied mental health status of the hospital nurses (n = 1195)

Mental status	Mean	SD[A]	Min	Max
Depression	2.32	3.57	0	21
Anxiety symptoms	6.44	4.48	0	21
Somatisation	5.79	3.47	0	21
Social dysfunction	8.89	3.42	0	21
Mental disorders	23.44	11.4	0	21

[A]Standard deviation

- Anxiety symptoms as well as social dysfunction were significantly higher in fixed shift nurses as compared to rotating shift nurses (p = 0.035, p = 0.0001, respectively)

The results also showed that there was no significant difference between mental disorders and job tenure (p = 0.413).

Few occupational health studies have been conducted on the prevalence of the mental disorders among hospital nurses in Iran. This survey was implemented to study more thoroughly on nurses' subjective mood and mental health status in Shiraz and therefore represented the first such large-scale study. The results revealed that 45.4% of nurses studied were at risk of developing mental disorders. It is to be noted that the nurses experienced depression and anxiety disorders commonly associated with work organization and work demands, such as shift working, meeting the demands of supervisors and physicians, dealing with the conflicting demands of administration and management and meeting the needs of patients.

Comparing the results of local studies on other target groups such as adult population or female workers with the results of this study showed that the prevalence rates of mental disorders among nurses studied were higher than the rates in Noorbala *et al.* (2004) and Ahmad-Nia (2002) studies (Table 5). This indicates that nursing job can be considered as a high risk occupation for developing mental disorders.

Social dysfunction was the most prevalent disorder among nurses studied (79.5%) which was significantly

Table 4: Mean and standard deviation of subscales and scores in gender, marital statues, shift working and type of hospital groups (n = 1195)

Variables	D[A]		AS[B]		S[C]		SD[D]		MD[E]	
	M	SD	M	SD	M	SD	M	SD	M	SD
Gender										
Male (n = 131)	1.700	3.0	5.2000	3.9	4.3000	2.9	9.3000	3.4	20.7000	7.9
Female (n = 1064)	2.400	3.6	6.6000	4.5	5.9700	3.5	8.4000	3.4	24.0000	11.7
p-value*	0.033		0.0007		0.0001		0.0040		0.0020	
Marital status										
Unmarried (n = 592)	2.500	3.9	6.1000	4.3	5.6000	3.3	8.6000	3.1	20.5000	13.1
Married (n = 603)	2.100	3.1	6.6000	4.5	5.7000	3.4	9.1000	3.6	23.6000	9.7
p-value*	0.049		0.0490		0.6060		0.0100		0.0001	
Shift working rotating										
Shift (n = 1073)	2.300	3.5	6.3000	4.5	5.8000	3.5	4.8000	3.4	23.4000	11.5
Fixed shift (n = 122)	2.700	3.5	7.2000	4.1	6.0000	3.1	9.1000	3.2	25.0000	9.3
p-value*	0.230		0.0350		0.5460		0.0001		0.1380	
Type of hospital										
Governmental (n = 408)	2.400	3.6	6.8000	4.6	6.2000	3.6	8.7000	3.4	24.3000	10.1
Non-governmental (n = 751)	2.100	3.4	5.7000	4.1	4.9000	2.9	9.1000	3.4	22.5000	13.1
p-value*	0.160		0.0001		0.0001		0.0560		0.0160	

[A]Depression; [B]Anxity symptous; [C]Somatisation; [D]Social dysfunction; [E]Mental disorders *Independent t-test

Table 5: Comparison of prevalence of depression, anxiety symptoms, somatisation, social dysfunction and mental disorders in general Iranian population, Ahmad-Nia study (2002) and in the study population

Mental health statues variables	Study population (%)	General Iranian population (%)	Ahmad-Nia study (%)	p-value[A]	p-value[B]
Depression	11.2	21.0	2.26	<0.0001	<0.0001
Anxiety symptoms	43.2	20.8	8.47	<0.0001	<0.0001
Somatisation	34.5	17.9	-	<0.0001	-
Social dysfunction	79.5	14.2	-	<0.0001	-
Mental disorders	45.4	20.9	25.30	<0.0001	<0.0001

[A]Test of proportion (difference between study population and general Iranian population)
[B]Test of proportion (difference between study population and Ahmad-Nia (2002) study population)

higher than its rate in general Iranian population with prevalence rate of 14.2% (p<0.05) (Noorbala *et al.*, 1999). This could be attributable to high workload leading to fatigue and exhaustion (Rashidinik, 2001).

In an epidemiological study on Iranian population (2001), the prevalence rate of anxiety disorders and depressive symptoms were reported to be 8.48% and 2.26%, respectively (Ahmad-Nia, 2002), while in the present study those rates were found to be 43.2 and 11.2%, respectively, which were significantly higher (p<0.0001).

The prevalence rates of mental disorders obtained in this study were lower than rates reported by Suzuki *et al.* (2004), but higher than those obtained by Mori and Kageyama (1995).

The present study also found that female nurses were 2.7 times more at risk of mental disorders as compared with male nurses. These findings were consistent with the results of other studies (Mori and Kageyama, 1995; Suzuki *et al.*, 2004; Kessler, 1994; Fakhari *et al.*, 1999). Association was also observed between sex and the subscales including, anxiety and depression. The mentioned problems were more prevalent among male than female. This is in accord with the result of Kessler (1994).

No significant association was found between mental disorders and age and job tenure. Social dysfunction was significantly associated with age such that social dysfunction increased with age increasing. Stansfeld and Marmot (1992) believed that mental disorders occurred less, particularly in females, when job tenure was low.

The results of the present study also showed that depression was more prevalent among single nurses, but social dysfunction occurred more prevalent among married nurses (p<0.05). Fakhari *et al.* (1999) pointed out that the rate of mental disorders among married was 1.59 times higher than that of singles. The study revealed a significant association between shift work and anxiety (p<0.05). These findings were in agreement with the results of other studies such as Suzuki *et al.* (2004) and Mori and Kageyama (1995).

CONCLUSION

In conclusion, the results of the present study showed that mental health status of the hospital nurses was poor, as shown by mean GHQ-28 score. This study also supported the results of previous studies showing high rates of mental disorders among hospital nurses.

The mental health pattern among hospital nurses is similar to the national information on the prevalence of mental disorders, but it seems that the prevalence of social dysfunction and anxiety disorders in the nurses is higher than Iranian population. Paying more attention to shift work nurses' health, particularly female nurses, through shift work health education program, occupational health consultation and periodical examinations is recommended.

ACKNOWLEDGMENTS

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