

Life Change Units (LCU) Rating as Stressors in Iranian Hospitals' Nurses

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Abstract- Healthcare workers suffer from work-related or occupational stress. This can lead to severe distress, burnout or physical illness, and finally to decrease quality of work life and services provision. Nurses must be aware of retential stressors, because they add to the cumulative effect of other stressful events. Holmes and Rahe both found a relationship between life change unit as stressors and health changes. This research reported here aims to measure the life change units as stressors among Iranian Hospitals Nurses by LCU rating. A cross – sectional, descriptive and analytical study was conducted among 389 nurses working in 15 teaching hospitals in Tehran, Iran. The respondents were asked to select each of 54 events that cause stress ranked in order of their life change units developed by Holmes and Rahe as stress scale. Before beginning the main study, the reliability and coincidental validity was performed. All data were analyzed using SPSS for windows version 18, t-test, Anova statistical methods. Approximately, half of the nurses associated major mortgage, foreclosure of mortgage or loan. More than 50% of the Iranian nurses had 150-300 and more than 300 LCU rating which had the chance to expose to extremely serious risk to health. Iranian hospitals nurses suffer from stress that caused by Life Change Units organizational factors such as change in the financial state, change in the work environment and major mortgage. We recommend to Iranian nursing policy-makers to choose strategies to help nurses' cope effectively with workplace stressors. Nursing managers and / or nursing management should develop strategies to address and improve the quality of working conditions for nurses in the hospitals. Providing educational and career prospects can contribute to decrease nurses' occupational stress level, the maintaining their work ability.

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Introduction

Stress has to do with disputes of most organization employees especially healthcare workers. Stressful factors influence the employees in every aspect of personal and organizational lives. Stress is defined as “a physical, chemical, or emotional factor that causes bodily or mental tension and may be a factor in disease causation” as Merriam – Webster definition. Threats, challenges, and any change as personal and organizational demands are consequences of stress as a nonspecific response. As a whole, stress originates from internal or external context. Family illness and death, employment concerns and money problems are external stressors. On the other hand, internal stressors include worrying and negative self-talk. In the event that, if stress is not managed effectively, it can influence all aspects of health and can have many continuous consequences (1).

Healthcare employees are injured from organizational or occupational stress originated from insufficient time, skills and education, related with supervisor's high expectations. Sever distress; burnout, absentees, physical disease and finally decreased quality of work life are reseated from these stressors (2).

Simple and special jobs with improved efficiency were common in the new century. Although, employees were appointed limited jobs and involved with strict hierarchy. These factors were the causes of absenteeism, higher job turnover and decreased employees' efficiency and work quality. It seems, job simplification and specification cannot cause job satisfaction (3).

Pioneer organizations are involved with new ideas and policies to improve employees' quality of work life. These organizations support their employees by these ideas and policies not to turn the scale. Time flexibility and work schedules, telecommunicating, and intensive

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workdays and works as various programs are accepted by these organizations (4).

Several professions with different jobs are confronted by different kinds of stress, that is, impress job environment which resulting affects job performance (5).

Healthcare organizations, for example, hospitals should provide technological contributions, and appropriate environments to overcome stress (6).

Psychological distress has negative impression on healthcare employees' health and quality of patient services. Work ability of these employees depends on physical, mental and social needs of their work (7).

"Salye" pointed out that nurses' performance decreased because of their stressful occupational environment. He stressed that nursing is the most stressful profession among healthcare organizations (8).

Most researchers have expressed that nurses are encountered a variety of stressors because of their shortage increase, incidence of chronic disease incuse, and technology development. Therefore, nurses should be trained how to recognize their workplace stressors and to adapt continuously and effectively with these stressors to improve their physical and mental health (9).

"Yu Cui" & "Yong Cui" (2003) reported that nurses with lack of authorized, unstable work environment, absent minded, overfeeding work and frequent rotation on their duty are physically unwell (10).

Stress has subjective perception, therefore, nurses' identification of stress resources, changing of their roles and workplace environment are resulted from problems of nursing practice. These measures address complexity of stress in the nursing profession (11).

Nursing profession has new region because of its technological development and innovation. Therefore, it develops objective presence in health systems and strengthens the human quality of nursing care (6).

American Nurses Association survey reported that most nurses encountered work stress. In addition, the International Council of Nurses showed that nurses are dialed with major sources of stress because of patient death and dying, conflicts with coworkers, lack of supervisors' support and work overload (1).

Nurses must be aware of retention stressors affecting clients because they add to the cumulative effect of other stressful life events (12).

Occupational stressors need to paid attention as a focus for researches in the nursing profession (13).

"Yang *et al*". (2004) was conducted to assess occupational stress and work ability. They found that the

correlation of work ability and occupational stress, strain, personal resources were significant (14).

"Xiao *et al*". expressed that decreasing the levels of occupational stressors for nurses especially decreasing the levels of role insufficiency and role ambiguity, would enhance the coping resources of nurses, so as to enhance their capability of relieve strain (15). "Sharifnia *et al*". expressed that the nurses were known as a high-risk group for occupational low back pain. Back pain is one of the most serious problems of nursing job, which is associated with psychological stress at work (16). "Mehrabi *et al*". stated that occupational stress was one of the most important occupational risk factors that can cause a decrease in production and bring about works absence, human resources shift, Job dissatisfaction and high health costs among the staffs. American National Occupational Safety Association has reported nursing, as the first among other 40 stressful occupations were experienced moderate stress (17).

The work environment may influence nurses' stress positively, and job satisfaction of nurses and their tendency to change jobs may be negatively impacted by stress. "Applebaum *et al*". reported that there are significant relationships between noise with perceived stress, perceived stress with job satisfaction and turnover tendency, and job satisfaction with turnover tendency (18).

"Wang *et al*". Explored the correlation between the degree of fatigue and job stressors in nurses. They showed that the total score of fatigue and the score of physical fatigue were positively correlated with age and the length of service (19).

Insecure work contracts and shift work have repeatedly been found to contribute to the development and continuation of negative outcomes among healthcare professionals. In particular, nurses are generally considered as being at high risk of work-related stress and reduced wellbeing. Insecure work contract was associated with lover work ability and job involvement. Shift work was related to psychological distress, low job involvement and low work ability (20).

Nurses suffer high levels of stress because they encounter challenges of ill children and their families when these children have critical disease. These levels of stress may decrease nurses' job satisfaction and job turnover intention (21).

One in every three nurses may be threaten by high burnout. Nurses' burnout is influenced by nurses' access to resources (22).

LCU rating as stressors

Identification of potential academic stressors are very important among nursing students who have experienced several examinations, research activities, clinical education and other assignments. They must encounter handful equipment and perform procedures that cause trouble to their patients. Nursing students may be exposed to sever stress than other students and influenced by psychiatric symptoms as previous studies indication (23).

Most studies in Taiwan related to depression have focused on the public rather than nurses. The moderating effects of coping behaviors and social support on the relationship between job stress and depression have not been well studied among nurses. Job stress and affective-oriented coping were significantly positively correlated. Coping behavior was not a significant moderator on the relationship between job stress and depression scores among nurses, but social support was (24).

“Stehle” stated that although critical care units are presented high stressful, bat it seams, these units are not more stressful than other types of nursing departments (25).

“Dermody” & “Bennett” explored nurse stress in both in – centre hospital haemodialysis and satellite haemodialysis unit in an Australian city’s health service. The most notable stressor for the staff at the satellite unit related to patient behavior and the perceived unrealistic expectations of the patient followed by patients arriving unwell at the unit (26).

“Admi” & “Moshe-Eilon” indicated that charge nurses encounter six stressors within a large tertiary hospital in Israel: authority-responsibility disagreement, patient-nurse communication, deficiency of resources, managerial decision- making, role conflict, and work overload (27).

“Perdikaris et al”. who provide a summary of the existing published knowledge on the possible relationship between the workplace as a stressor factor and nurses tobacco use, showed that there is a conflict on the possible relationship between workplace as a stressor factor and nurses smoking habits, because there is no evidence on if the nurses work environment causes smoking initiation (28).

“Zeng” believed that the specific stressors among Chinese nurses were effort reward imbalance, the poor image of nursing in the community and managerial issues (29).

The most famous stress test is probably the one that was developed by Dr. Thomas Holmes and Dr. Richard Rahe. This test examines the stress factors in the life.

Life Change Unit (LCU) (30) measures these stress factors.

- This is a list of 54 events that can cause stress; they are ranked in order of their LCU, from the high-risk changes down to the lower risk ones. There are many other events in life that can create stress, but Holmes and Rahe decided to concentrate on just these common key events (30).

Previous researches state that Iranian nurses are encountered several types of stressors (23). Therefore, we believe that investigation of organizational and personal stressors of Iranian nurses must be more paid attention now in order to resist the stressors in Iranian hospitals.

This study is aimed to answer the following questions:

- What are the sources of stress for Iranian nurses?
- Which are the sources of stress impressed higher on Iranian nurses?
- Is there a significant correlation between Iranian nurses’ demographic information with a variety of stress factors?
- What should be the directions of further research on stress in nursing?

Materials & Methods

A cross – sectional, descriptive and analytical study was conducted among nurses working in 15 teaching hospitals in Tehran, Iran. First, we collected the total number of teaching hospitals and their nursing personnel with BSc. and MSc. degrees in four regions of Tehran and the frequency of the hospitals in each region.

Then, we randomly select 4 teaching hospitals from South, East and West and 3 hospitals from north of Tehran. The total number of nursing staff was 2430 in 15 teaching hospitals; therefore, we select 486 nurses by using stratified random sampling technique as respondents as 20% of total nursing staff in 15 hospitals. The respondents were asked to select each of 52 events that cause stress ranked in order of their Life Change Unit (LCU) from the most high risk changes down to lower risk ones. Approximately 486 questionnaires were given to nurses working in both medical and surgical in 15 hospitals. The head nurse on the each ward distributed the questionnaires, and the completed questionnaires were returned to one of researchers in a sealed envelope through the hospitals nursing department. 97 of the nurses refused to complete the

questionnaire. Therefore, the response rate was 80% (389/486).

The respondents were tested just go through the list of events and add up the points of the events that have happened in the last year to get LCU Rating as following LCU below 150: Nurses have a 35% chance of illness, LCU between 150-300: chance increase to 51%, LCU over 300: chance increase to 80% that will become a very serious risk to health (30).

LCU scale has been assessed against different populations and tested cross-culturally (31). Although, after translating of LCU questionnaire in Farsi, their content validity was established by a panel of experts and their reliability was determined by Cronbach's Alpha, which was 0.88 for the Iranian nurses' LCU. All data were analyzed using SPSS for windows version 18, t-test and Anova statistical methods.

Results

We have reported here only the most important and significant results of this analysis. Approximately, half of the nurses were female (53%) (Table 1). Most of them were BSc. degree (75%) (Table 2).

Over half of the cases (205/389, 53%) reported that minor mortgage or loan appeared as stressors. Approximately, half of the nurses associated major mortgage, foreclosure of mortgage, or loan, as LCU events. In addition, we found a positive correlation between the nurses LCU rating and their gender ($P=0.013$) and their degrees ($P=0.021$) (Table 3, 4). Thus, the female nurses and the nurses with BSc. degrees received of hazards of workplace as statistically significantly more stressful than male and MSc. nurses.

Table 1. Distribution frequency of nurses' sex by life change unit (LCU), rating in teaching hospitals of Tehran, Iran.

Sex	LCU Rating						Total	
	< 150		150-300		>300			
	N	%	N	%	N	%	N	%
Female	75	84	198	89	42	53	315	80
Male	12	26	25	11	37	47	74	20
Total	89	100	223	100	79	100	389	100

Table 2. Distribution frequency of nurses' degrees by life change unit (LCU), rating in teaching hospitals of Tehran, Iran.

Degree	LCU Rating						Total	
	< 150		150-300		>300			
	N	%	N	%	N	%	N	%
Associate of Sciences	31	21	15	12	12	11	58	15
BSc.	110	73	101	78	79	72	290	75
MSc.	9	6	14	10	18	17	41	10
Total	150	100	130	100	109	100	389	100

Table 3. Correlation between job stress and nurses gender.

Sample (N=389)	Mean	SD
Male (N = 74)	212.32	111.15
Female (N=315)	296.18	173.3

$P<0.05$

Table 4. Correlation between job stress and nurses degree.

Sample (N=389)	Mean	SD
Associate of sciences (N=58)	225.12	95.19
BSc. (N=290)	275.16	125.12
MSc. (N=41)	240.15	117.16

$P<0.05$

Table 5. Comparison of organizational, economical, familial and social stressors among Tehran hospitals' nurses.

Stressors	Mean	SD	Max	Min
Organizational	77.26	60.5	284	
Economical	69	60	200	
Familial	54	42.1	186	
Social	23.3	32	145	

LCU rating as stressors

Table 6. The distribution frequency of nurses by each of life change unit (LCU), rating in teaching hospitals of Tehran, Iran.

LCU events	LCU Rating					
	Yes		No		Total	
	N	%	N	%	N	%
Outstanding personal achievement	43	11	346	89	389	100
Begin of end of college	66	17	323	83	389	100
Change in Social activities	135	35	254	65	389	100
Minor violation of laws	51	13	338	87	389	100
Troubles with co-workers	40	10	349	90	389	100
Business readjustment	54	14	335	86	389	100
Change in financial state	164	42	225	58	389	100
Change in frequency of arguments	165	42	224	58	389	100
Major mortgage	191	49	198	51	389	100
Foreclosure of mortgage or loan	182	48	217	52	389	100
Change of living condition	150	39	239	61	389	100
Minor mortgage or loan	205	53	184	47	389	100
Family member having trouble with drugs or alcohol	27	7	362	93	389	100
Getting into alcohol or other drugs	13	3	376	97	389	100
Getting badly hurt or sick	78	20	311	80	389	100
Change in work environmental condition	133	34	353	66	389	100
Trouble with boss	63	16	323	84	389	100
Change in work hours (shift work)	141	36	248	64	389	100
Spouse stops or starts work	26	7	363	93	389	100
Change in responsibilities at work	48	12	341	88	389	100
Job demotion	67	17	322	83	389	100
Retirement	24	6	365	94	389	100
Losing a job	43	11	346	89	389	100
Breaking up with a close partner	38	10	331	90	389	100
Starting a job	29	7	360	93	389	100
Having problems with any of the following : acne, overweight, too tall , too short	110	28	279	72	389	100
Making new friends	35	9	354	91	389	100
Starting menopause	67	17	322	83	389	100
Imprisonment	2	1	387	99	389	100
Personal injury of illness	55	14	334	86	389	100
Accident	52	14	337	86	389	100
Major dental work	77	20	312	80	389	100
Pregnancy	20	5	569	95	389	100
Gain a new family member	17	4	372	96	389	100
Death of close friend	35	9	354	91	389	100
Change in personal habits	77	20	312	80	389	100
Change in residence	64	16	325	84	389	100
Change in recreation	139	36	250	64	389	100
Change in prayer activities	98	25	291	75	389	100
Change in sleeping habits	132	34	257	66	389	100
Vacation	142	36	247	64	389	100
Change in eating habits	177	45	212	55	389	100
Trouble with child's teacher or principal	10	3	379	97	389	100
Change in number of arguments with spouse	76	20	313	80	389	100
Death of spouse	14	4	375	96	389	100
Divorce	9	2	380	98	389	100
Change in health of family member	96	25	293	75	389	100
Marital reconciliation	5	2	384	98	389	100
Marriage	27	7	362	93	389	100
Marital separation	25	6	364	94	389	100
Death in number of family reunions	25	8	364	92	389	100
Trouble with in – Laws	81	21	308	79	389	100

39% of Iranian nurses had less than 150 LCU rating that had 35% chance of illness by stress symptoms. 33% of the nurses had 150-300 and 28% of them had more than 300 LCU rating, which had chance increases illness to 51% and 80% that they would be exposed to very serious risk to health. Although, we showed that organizational stressor were the most factors among TUMS nurses.

Discussion

During the last decades, nursing has changed in many ways, putting extra pressure on nurses. Several researchers describe nursing career as stressful job. Work under pressure, stress and dissatisfaction with overload working hours are some of the negative factors. The shortage of nurses and high staff turnover rates within the health care system are compromising the nurses' ability to provide competent and compassionate care (32-34). High rates of staff turnover cause negative effects on productivity and effectiveness of nurses. Job satisfaction of nurses influences the quality of the care they provide, just as nurses job satisfaction influences the nurses-patient relationship (35, 36). In addition, there is a reciprocal relation between job performance and stress (37).

Although, nursing stress has been studied extensively, there is a lack of clarity on the nursing situation in Iran. There are several positive attributes of this study. In the first, it is initial LCU rating investigation of nurses in Iran. Secondly, we developed LCU questionnaire developed by Holmes and Rahe through a combination of 54 events that cause stress. Finally, the findings of this research appeared to judge credible by healthcare policy-makers and hospitals nursing leaders in Iran.

Stress is a major concern in the nursing profession with work overload, nurse shortage and high turnover rates as the common stressors (38). It contributes to health problems in nurses and decreases their organizational efficiency. Documenting the causes and extent of stress in any health care unit is essential for successful interventions (39). In our research, we found that more than 30% of the hospitals' nurses were believed that they work unsatisfied with change in the work environment condition because of importance of the work stressors. This is also similar to" Fan Chuanling et al". &"Mehrabani et a".l. (10, 17).

"Golubic et al". identified six major groups of occupational stressors: organization of work and financial issues, public criticism, hazards at workplace,

interpersonal conflicts at workplace, shift work, professional and intellectual demands (40). We also showed that approximately 50% of Iranian hospitals nurses perceived that they had more change in the financial state, mortgage or loan and shift work as more job stressors.

"Kang et al". Suggested that death of parents is the highest stress-giving factor for employees of small and medium sized organizations in South Korea. The death of parents and close friends are ranked higher in the Korean LCU model (41).

The results of our research showed that death of parents and close friends are ranked higher in Iranian LCU model too, but there is not the main event in LCU factors.

We found that only 10% of the nurses had trouble with co-workers as a stressor, although "abualrub" showed that there was negative correction between job stress and American nurse's colleagues support (5).

Collating the evidence from the literature led to identification of several main themes for the sources of workplace distress for nurses that is workload, leadership / management issues, professional conflict, work environment, lack of clarity about task / goals, lack of reward, shift working, lack of participation in decision-making (42-48). It seems, these themes, are not main events in Iranian nurses LCU model.

In addition, several reports expressed that physical workload, communication problems with coworkers, interprofessional conflicts and lack of involvement in decision-making were ranked most highly stressful (49, 50). We found that, the main themes for Iranian nurses' life change unit are change in the financial state, major mortgage, change in the work environment. Therefore, this is not similar to previous research results.

"Mehrabani et al". reported that there was a significant association between marital status and occupational stressors (14), but this was not similar to our research.

Significant association was found between nurses' job stress with nursing leadership behaviors (18). This is similar to our research findings that Iranian hospitals nurses perceived that trouble with their boss was a stressor.

Finally, "Takase et al". & "Bonner et al". showed that there was significant job stress with reported feelings of anxiety (30, 51). This was similar to our research LCU factors that were higher in Iranian hospitals' nurses. In conclusion, Iranian hospitals' nurses suffered from stress that caused by Life Change Unit organizational factors such as change in the financial state, change in the work environment and major mortgage.

LCU rating as stressors

Even though, stress is here to stay, it does not have to wreak havoc on our lives. Nurses in every setting can play a pivotal role in reducing the toll that stress takes. Support services should be preventive, so that health problems for nurses can be averted. This requires more research into identifying the most effective way of detecting when individuals are experiencing early difficulties, and of improving their stress management techniques to prevent the transition to severe distress.

Iranian Nursing managers should explore both ways of reducing job stress and techniques for building social support network in the organization to protect their members against stress and depression. They should try to minimize the effects of stressors with physical activities, social support, spirituality, or attempt to separate work from personal life and choose strategies to help nurses cope effectively with workplace stressors. According to our analysis, the following items, prioritized in order to influence, are the key areas for nursing leaders to focus on to improve satisfaction:

- Management cares about employees
- Management listens to employees
- Management helps to reduce job stress
- Fair evaluations
- Workplace is safe
- Supervisors care about the nurses as a person.

Ethical considerations

Ethical issues including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication, redundancy, *etc.* have been fully observed by the authors.

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References

1. Patti Lucarelli, NP. ADVANCE for NPs & PAs. What does Stress have To Do With It? [online] 2010 Jul 15 [cited 2011 Oct 15]; Available from: [URL:http://nurse-](http://nurse-practitioners-and-physician-assistants.advanceweb.com/features/articles/whats-stress-got-to-do-with-it.aspx)

- [practitioners-and-physician-assistants.advanceweb.com/features/articles/whats-stress-got-to-do-with-it.aspx](http://nurse-practitioners-and-physician-assistants.advanceweb.com/features/articles/whats-stress-got-to-do-with-it.aspx)
2. Marine A, Ruotsalainen JH, Serra C, Verbeek JH. Preventing occupational stress in healthcare workers. *Cochrane Database Syst Rev* 2006;4:CD002892.
3. Venkatraman S. A Project Report On Quality of Work Life. What is QWL? University of Mumbai in Partial Fulfillment of Bachelor of Management Studies, Academic Year: 2004-2005, p. 11.
4. Nieto ML, Macmillan P. *An Introduction to Human Resource Management*. New York: Palgrave Macmillan; 2006.
5. AbuAlRub RF. Job stress, job performance, and social support among hospital nurses. *J Nurse Scholars* 2004; 36(1):73-8.
6. Guido Lde A, Linch GF, Andolhe R, Conegatto CC, and Tonini CC. Stressors in the nursing care delivered to potential organ donors. *Rev Lat Am Enfermagem* 2009; 17(6):1023-9.
7. Knezevic B, Milosevic M, Golubic R, Belosevic L, Russo A, Mustajbegovic J. Work-related stress and work ability among Croatian university hospital midwives. *Midwifery* 2011; 27(2):146-53.
8. Selye H. *The Stress of Life*. New York: McGraw-Hill; 1976.
9. Lambert VA, Lambert CE. Nurses workplace stressors and coping strategies. *Indian J Palliative Care* 2008; 14(1):38-44.
10. Chuanling F, Ruihua L, Cui W. Approach on related factors between nursing mistakes and accidents and behavior Science. *Shanxi Nurse J* 2002; three.
11. McVicar A. Workplace stress in nursing: a literature review. *J Adv Nurse* 2003; 44(6):633-42.
12. Brunero S, Cowan D, Grochulski A, Garvey A. *Stress Management for Nurses*. Sydney: New South Wales Nurses Association, 2006.
13. Evans AM, Pereira DA, Parker JM. Occupational distress in nursing: a psychoanalytic reading of the literature. *Nurse Philosophy* 2008; 9(3):195-204.
14. Yang X, Wang Z, Lan Y, Wang M. Appraisal of occupational stress and work ability. *Wei Sheng Yan Jiu* 2004; 33(1):5-8.
15. Xiao Y, Fan G, Feng C, Li W, Wang Z, Wang M, Lan Y. Effect of occupational stressors on coping resources of nurses in Nanchang. *Wei Sheng Yan Jiu* 2010; 39(3):339-41.
16. Hojati H, Nazari R, Saat saz S, Hagh Doost AA, Ghorbani M, Ajihosseini F. The relationship of low back pain with psychological factors and psychological stress in nurses in Amol Hospitals. *Knowledge Health J* 2010; 4(4):27-33.

17. Mehrabi T, Parvin N, Yazdani M, Asemanrafat N. Investigation of some occupational stressors among nurses. *Iran J Nurse Midwifery Res* 2005; 10(2):24.
18. Apple Baum D, Fowler S, Fiedler N, Osinubi O, Robson M. The impact of environmental factors on nursing stress, job satisfaction, and turnover intention. *J Nurse Adm* 2010; 40(7-8):323-8.
19. Wang W, Wang P, Zhou X, Liu Y, Zhang H. Correlation analysis between fatigue and job stressors of nurses. *Wei Sheng Yan Jiu* 2010; 39(1):76-8.
20. Elovainio M, Kuusio H, Aalto AM, Sinervo T, Heponiemi T. Insecurity and shift work as characteristics of negative work environment: psychosocial and behavioral mediators. *J Adv Nurs* 2010; 66(5):1080-91.
21. Bratt MM, Broome M, Kelber S, Lostocco L. Influence of stress and nursing leadership on job satisfaction of pediatric intensive care unit nurses. *Am J Crit Care* 2000; 9(5):307-17.
22. Harwood L, Ridley J, Wilson B, Laschinger HK. Workplace empowerment and burnout in Canadian nephrology nurses. *CANNT J* 2010; 20(2):12-7.
23. Seyedfatemi N, Tafreshi M, Hagani H. Experienced stressors and coping strategies among Iranian nursing students. *BMC Nurs* 2007; 6:11.
24. Lin HS, Probst JC, Hsu YC. Depression among female psychiatric nurses in southern Taiwan: main and moderating effects of job stress, coping behavior and social support. *J Clin Nurs* 2010; 19(15-16):2342-54.
25. Stehle JL. Critical care nursing stress: the findings revisited. *Nurs Res* 1981; 30(3):182-6.
26. Dermody K, Bennett PN. Nurse stress in hospital and satellite haemodialysis units. *J Res Care* 2008; 34(1):28-32.
27. Admi H, Moshe-Eilon Y. Stress among charge nurses: tool development and stress measurement. *Nurs Econ* 2010; 28(3):151-8.
28. Perdikaris P, Kletsiou E, Gymnopoulou E, Matziou V. The relationship between workplace, job stress and nurses' tobacco use: a review of the literature. *Int J Environ Res Public Health* 2010; 7(5):2362-75.
29. Zeng Y. Review of work-related stress in mainland Chinese nurses. *Nurs Health Sci* 2009; 11(1):90-7.
30. Holmes TH, Rahe RH. The Social Readjustment Rating Scale. *J Psychosom Res* 1967; 11(2):213-8.
31. Masuda M, Holmes TH. The Social Readjustment Rating Scale: a cross-cultural study of Japanese and Americans. *J Psychosom Res* 1967; 11(2):227-37.
32. Humpel N, Caputi P. Exploring the relationship between work stress, years of experience and emotional competency using a sample of Australian mental health nurses. *J Psychiatr Ment Health Nurs* 2001; 8(5):399-403.
33. National Board of Health and Welfare. Yearbook of Health and Medical Care. Stockholm: SBU (Swedish Council on Technology Assessment in Health Care), 2001.
34. Burke TA, McKee JR, Wilson HC, Donahue RM, Batenhorst AS, Pathak DS. A comparison of time-and-motion and self-reporting methods of work measurement. *J Nurs Adm* 2000; 30(3):118-25.
35. Hinshaw AS, Atwood JR. Nursing staff turnover, stress, and satisfaction: models, measures, and management. *Annu Rev Nurs Res* 1983; 1:133-53.
36. Takase M, Kershaw E, Burt L. Nurse-environment misfit and nursing practice. *J Adv Nurs* 2001; 35(6):819-26.
37. Westman M, Eden D. The inverted-U relationship between stress and performance: A field study. *Work Stress* 1996; 10(2):165-73.
38. Lim J, Bogossian F, Ahern K. Stress and coping in Australian nurses: a systematic review. *Int Nurs Rev* 2010; 57(1):22-31.
39. Kane PP. Stress causing psychosomatic illness among nurses. *Indian J Occup Environ Med* 2009; 13(1):28-32.
40. Golubic R, Milosevic M, Knezevic B, Mustajbegovic J. Work-related stress, education and work ability among hospital nurses. *J Adv Nurs* 2009; 65(10):2056-66.
41. Kang Y, Hahm H, Yang S, Kim T. Application of the Life Change Unit model for the prevention of accident proneness among small to medium sized industries in Korea. *Ind Health* 2008; 46(5):470-6.
42. Williams S, Michie S, Pattani S. Improving the health of the NHS workforce. London: The Nuffield Trust; 1998.
43. Hillhouse JJ, Adler CM. Investigating stress effect patterns in hospital staff nurses: results of a cluster analysis. *Soc Sci Med* 1997; 45(12):1781-8.
44. Healy CM, McKay MF. Nursing stress: the effects of coping strategies and job satisfaction in a sample of Australian nurses. *J Adv Nurs* 2000; 31(3):681-8.
45. Ball J, Pike G, Cuff C. Royal College of Nursing (RCN). Working well? [online] 2002 Mar [cited 2011 Oct 15]; Available from: URL:http://www.rcn.org.uk/_data/assets/pdf_file/0008/78524/001572.pdf
46. McGowan B. Self-reported stress and its effects on nurses. *Nurs Stand* 2001; 15(42):33-8.
47. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. A model of burnout and life satisfaction amongst nurses. *J Adv Nurs* 2000; 32(2):454-64.
48. Stordeur S, D'hoore W, Vandenberghe C. Leadership, organizational stress, and emotional exhaustion among hospital nursing staff. *J Adv Nurs* 2001; 35(4):533-42.
49. Huckabay LM, Jagla B. Nurses' stress factors in the intensive care unit. *J Nurs Adm* 1979; 9(2):21-6.

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50. Dickinson T, Wright KM. Stress and burnout in forensic mental health nursing: a literature review. *Br J Nurs* 2008; 17(2):82-7.
51. Benner P, Hooper-Kyriakidis P, Stannard D. *Clinical Wisdom and Interventions in Critical Care: A Thinking-in-Action Approach*. Philadelphia, PA: WB Saunders; 1999.