

Path Analysis of Depression and Quality Of Life Among Nurses

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Background: Broad range of nursing activities and its interdisciplinary nature have caused work stress and mood changes such as depression and other mental illnesses among nurses. Patients' health and safety are directly related to work setting and the treatment of health care team.

Objectives: The present study aimed at examining depression-related factors as well as quality of life among nurses working in Ilam hospitals.

Patients and Methods: This research is a cross-sectional study, which was conducted on all the nurses working in hospitals of Ilam during 2013. Collection of the study data was accomplished by using Beck depression inventory (BDI) and SF-12 questionnaires. Then, we used path analysis, a technique applied to test casual models. To conduct the path analysis of depression and quality of life, at first a preliminary casual mode was developed and then the final model of depression and quality of life was identified using multiple regression analysis.

Results: According to the final model yielded from path analysis, the most important factors contributing to depression are mental component of quality of life, marital status, night shifts, age, physical component of quality of life, and overtime which their direct effects on nurses' depression are stronger than their indirect effects (through mental and physical components).

Conclusions: Based on the study results, making plans to promote mental aspect of nurses, focusing on family foundations like marriage, reducing and distributing working hours, and decreasing night shifts hours of nurses could reduce their depression and improve their quality of life.

Keywords: Quality of Life; Depression; Nurses

1. Background

People working in health service are believed to be much more susceptible to mental diseases, risk of suicide, and depression than general population (1). It is important to take account of individuals' mental health in all aspects of individual, social, and work life. In this regard, the nurses who consist a large proportion of health service has a stressful job. They serve to care for patients as well as their physical and mental conditions (2). Nurses, as a powerful part of the health care service, play a pivotal role in care, treatment development, and health promotion (2, 3). Hence, it is important for nurses to be mentally and physically healthy (4, 5). Nurses are prone to mental and physical stresses owing to long working shifts and the resulted fatigue. Nurses without enough mental and physical health, would not be able to do functions like furnishing the patient with mental and physical support (5, 6).

Depression as a common disorder in psychiatry as well as in medicine manifests with mental illness, lack of energy, loss of strength, frustration, uselessness, interestlessness, and pessimism (7). Depression is an aggregation of different mental and psychological attitudes expressed from mild distress to silence to everyday life activities

avoidance. Basic depression is a term coined by the American association of psychiatry in 1980 referring to the total sum of affective disorder symptoms for DSM-III which later this term got popularized. Depression gives rise to significant incapability in individual, social, and work life, and has an impact on one's daily performance like eating, sleeping, and health care (8, 9).

This mental disorder is considered the fourth disabling factor worldwide and predicted to turn out as the second disabling disease by the year 2020 (10). There is a direct relation between the incidence of depression and mental tensions. At work, stress and depression could be caused by physical, psychological, and social stimuli (6, 10). An aggregation of unrelieved stresses can cause chronic fatigue and depression in nurses resulting from frustration. Depression caused by job-related stress brings about damages in the form of medical expenses, loss of work hours, and a reduction in production. Absenteeism is another after-effect of depression turning into a problematic situation (9, 10).

The onset age of depression ranges from childhood to old age, but in 50% of cases the onset range is 20 - 50 years which most of active force of nursing profession fall into

this range (11). According to previous studies, nurses' depression may be linked with various factors such as age, long working hours, night shift, and socioeconomic factors (3, 5, 11). Quality of life is also another psychological part of people's life indicating to what extent efficiency is matched with a person's health (12). The World Health Organization (WHO) defines quality of life as an individual's perception of his or her place in life based on cultural conditions and value-social system in which she or he lives and the perception takes meaning in relation to his or her primary aims, attitudes, and views. This issue is extensively affected in various ways by the individual's physical and mental status, beliefs, and social communications. Quality of life should be considered an important index in a person's mental and physical aspects, as it may contribute to increase in the person's efficiency and prevent mental disturbance (13, 14).

2. Objectives

Given the importance of depression and nurses' quality of life as a key factor in the health care system, and considering the fact that nurses' health security affects the quality and quantity of health services which eventually secure community's health, we aimed to explore depression and quality of life among nurses in Ilam hospitals using casual path analysis model. There are some factors that their relations with depression and quality of life will be looked into, such as age, marital status, sex, couple's job, couple's education, parents' death before the age of 11, family size, constant intake of contraceptive drugs over the last 3 months, current pregnancy, overtime hours, and night work hours.

3. Patients and Methods

The study has a cross-sectional design and conducted on all employed nurses (191 nurses) in Ilam hospitals working shifts in 2013. These hospitals included Imam Khomeini with 71 nurses, Mostafa Khomeini with 74 nurses, Taleghani with 26, Ghaem with 10 nurses, Kosar Maternity with 6 nurses, and social security clinic with 4 nurses. Since they had different shifts, the researchers had to visit them frequently on the job and justify them with regard to the objectives of the study. After orienting all nurses, two questionnaires: 21-item Beck Depression Inventory (BDI) and quality of life (Short form-12) with previously confirmed validity and reliability were distributed among the nurses. Quality of life questionnaire (SF-12) is a modified form of SF-36. The questionnaire comprised of 8 sections divided into two final dimensions: physical and mental. The Cronbach α and intraclass correlation coefficient (ICC) for SF-12 are reported to be 0.70 and 0.60, respectively. And for BDI, they are 0.87 and 0.65, respectively. The BDI score ranges from 0 to 63, and its classification is presented in the Table 1. Also, range of the SF-12 was 1 - 5 for each component that 1 - 2, 2 - 3, 3 - 4, and 4 - 5 showed bad, moderate, good, and very good status for each component, respectively (15, 16).

Table 1. Depression Profile Among Ilam Nurses in Terms of Intensity^a

Depression Level	No. (%)	Mean \pm SD	95% Confidence Level
Low (0 - 13)	66 (34.55)	7.78 \pm 1.85	4.15 - 11.40
Mild (13 - 19)	60 (31.41)	15.23 \pm 2.02	11.27 - 19.19
Moderate (20 - 28)	56 (29.32)	23.10 \pm 4.45	14.37 - 31.82
Severe (29 - 63)	9 (4.71)	38.40 \pm 8.70	21.34 - 55.45
Total	191 (100)	21.13 \pm 4.25	12.80 - 29.46

^a Data are presented as No. (%) or mean \pm SD.

3.1. Path Analysis

Path analysis is a statistical technique applied to determine casualty and tests casual models which must be a casual graph. In fact, path analysis represents casualty. Path analysis, a form of applied regression analysis, is applied to test complex hypotheses in which path graph is used (17). Path analysis determines to what extent an independent variable directly and indirectly affect the dependent variable. Using path analysis, it is possible to measure the direct and indirect effects of the independent variables on the dependent ones. Therefore, path analysis allows us to spot the compatibility of variable's effect with one another. Path analysis provides a great deal of information as to the casual processes in a simple way (18). It is used to determine the direct and indirect effects as well as inefficiency among variables embedded in a casual system. Hence, the principle of causality plays a pivotal role in using path analysis. It is noteworthy that the goal of path analysis is testing the analytical model of study, because path analysis diagram results in theoretical frameworks (19). Assumptions related to multiple linear regression were normal distribution of the dependent variable (Kolmogorov-Smirnov test (KS test) test: P value \geq 0.05), linear relationship between dependent variable and independents variable (Scatter plot), and homoscedasticity and collinearity status among the independent variables (17-19).

In this study, the total score of depression, was entered the model as the main dependent variable. In the first step, a preliminary casual model for depression was developed based on previous research, then the model was analyzed using multiple regression and eventually the final model for depression was developed after eliminating insignificant variables ($P \geq 0.05$). In the model, standardized beta coefficient (β) yielded from multiple regression represents the relationship between variables, and coefficient of determination (R^2) yielded from regression analysis represents the model's efficiency. The independent variables that were considered based on the previous studies (7-12) included: physical and mental components (quality of life indexes), age, sex, marital status, spouse's job, spouse's education, parents' death before the age of 11, family size, history of depression, constant use of con-

traceptive drugs in the last 3 months, current gestation, overtime hours, and night work hours. Data were inserted into SPSS version 18 and analyzed using regression test and, in the end, the fit model was identified.

4. Results

Demographical information of the participants is presented in Table 2. As shown, some variables such as spouse's job ($P \geq 0.11$), spouse's education ($P \geq 0.28$), parents' death before the age of 11 ($P \geq 0.09$), family size ($P \geq 0.17$), constant intake of contraceptive drugs in the last 3 months ($P \geq 0.32$), and current gestation ($P \geq 0.72$) revealed no significance in the regression analysis, so they were excluded from the model.

R^2 coefficient representing efficiency and fitness of model (18) was yielded to be 0.48. In other words, the model can explain 48% variance of depression explained by the independent variables entered to the analysis.

The model of depression is presented along with interpretive tables and graphs in the following sections. Also, the state of quality of life and depression among nurses in Ilam city are presented respectively in Tables 1 and 2.

The mean of depression, in this study, was estimated to be 4.25 ± 21.13 ; nurses state of depression is also shown in Table 1 in terms of different degrees (Low, mild, moderate, severe). Given the preliminary model, the following path analysis model was developed for nurses' depression in Ilam using regression analysis.

Table 2. Demographic Characteristics of Nurses in Ilam Hospitals

Variables	Values ^a	BDI ^b
Age, y		
20 - 30	61 (31.94)	14.25 \pm 2.25
30 - 40	98 (51.31)	19.23 \pm 1.25
Over 40	32 (16.75)	27.25 \pm 3.78
Gender		
Female	117 (61.26)	22.28 \pm 3.45
Male	74 (38.74)	19.02 \pm 2.76
Marital status		
Married	97 (50.79)	24.25 \pm 2.208
Single	84 (43.98)	21.23 \pm 4.18
Widowed or divorced	10 (5.24)	22.76 \pm 3.25
Spouse's job		
Employed	118 (69.41)	21.15 \pm 4.36
Out of work	40 (23.53)	22.66 \pm 2.33
Other	12 (7.06)	19.65 \pm 2.58
Night shift hours per month		
Less than 5	10 (5.29)	17.01 \pm 3.33
5 - 15	61 (32.28)	17.96 \pm 3.96
15 - 25	68 (35.98)	22.76 \pm 3.25
25 - 35	32 (16.93)	23.05 \pm 3.25
Above 35	18 (9.5)	22.50 \pm 3.06
Mental component (MC)		
Bad	13 (6.81)	24.25 \pm 3.25
Moderate	34 (17.8)	23.22 \pm 4.05
Good	83 (43.46)	20.01 \pm 2.288
Very good	61 (31.94)	17.33 \pm 2.22
Physical component (PC)		
Bad	16 (8.38)	23.04 \pm 2.25
Moderate	58 (30.37)	22.62 \pm 2.77
Good	81 (42.41)	19.66 \pm 4.30
Very good	36 (18.85)	16.22 \pm 3.36

^a Data are presented as No. (%) or.

^b Data are presented as mean \pm SD.

Table 3. Regression Analysis of the Related Factors With Depression in Nurses

Variables	Unstandardized (B) Coefficient	SE	Standardized (B) Coefficient	t	P Value
Constant	3.95	0.95	-	18.25	0.01
Age	1.33	0.85	0.16	8.25	0.02
Overtime	1.02	1.33	0.12	7.75	0.04
Night shift	2.25	1.10	0.18	4.94	0.03
Marital status	2.01	0.85	0.25	5.36	0.02
History of depression	1.36	0.35	0.07	3.33	0.01
Sex	0.95	0.86	0.02	1.26	0.12
Physical component	3.25	0.89	0.24	9.25	0.01
Mental component	4.04	1.19	0.28	9.63	0.01
Spouse's job	1.25	0.96	0.06	1.25	0.11
Spouse's education	0.85	0.55	0.08	0.36	0.28
Parents' death	0.97	0.88	0.07	1.09	0.09
Family size	1.02	0.78	0.05	0.96	0.17
Intake of contraceptive drugs	0.96	0.61	0.08	0.81	0.32
Current gestation	0.88	0.36	0.01	0.33	0.72

Table 4. Direct Effect, Indirect Effect, and Total Effect of Independent Variables on Nurses' Depression Working In Ilam Hospitals

Variables	Direct Effect	P Value	Indirect Effect	P Value	Total Effect
Age	0.16	0.01	$(0.13 \times 0.28) + (0.13 \times 0.3 \times 0.24)$	0.02 - 0.01 ^a	0.21
Overtime	0.12	0.04	(0.24×0.15)	0.03	0.16
Night shift	0.18	0.03	(0.24×0.12)	0.03	0.21
Marital status (married/single)	0.25	0.02	$(0.35 \times 0.28) + (0.35 \times 0.3 \times 0.24)$	0.01 - 0.02 ^a	0.37
History of depression	0.07	0.01	-	-	0.07
Sex	-	-	$(0.12 \times 0.28) + (0.12 \times 0.3 \times 0.24)$	0.02 - 0.1 ^a	0.04
Physical component	0.24	0.01	-	-	0.24
Mental component	0.28	0.01	(0.3×0.24)	0.01	0.35

^a The P values related to first and second the indirect effects, respectively.

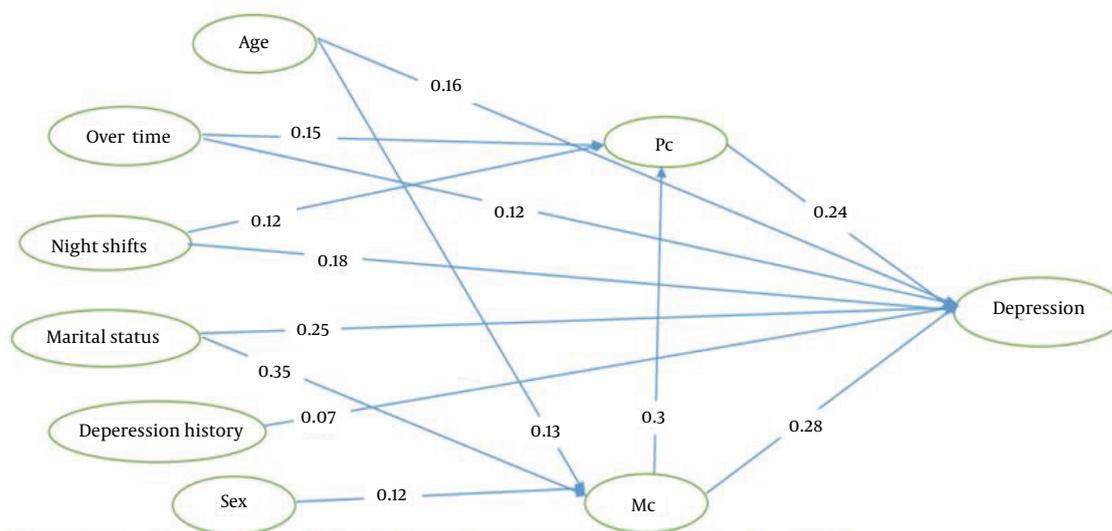


Figure 1. Path Analysis Model of Depression in Nurses in Hospitals of Ilam

5. Discussion

We found that the main factor contributing to depression are mental and physical components of nurses, marital status (married compared to single), night work hours, overtime, and history of depression among nurses whose direct effect outruns their indirect effect (through physical and mental components).

Mental component plays an essential part in depression as better mental health gives rise to increase in trust and cohesion and prevent depression (3, 4). However, compared to other jobs, nursing profession sets nurses up for numerous high-risk factors such as emotional issues related to the patient, arduous conditions of work, particularly in sections like CCU, ICU, and pediatric section, long working hours, night shifts, heavy workload which in turn increases stresses, depression, and emotion-related problems (1, 20). According to epidemiological studies, psychological factors at work setting play a pivotal role in developing depression. Nurses are exposed to high level of stress which causes depression in them (3, 5, 11).

Previous studies found a significant relationship between marriage and depression which is in accord with our findings (3, 5). Depression is found more in single people as married couples have a purposeful joint life and hopefully attempt to improve it; therefore, married nurses as opposed to single ones experience less, risk factors contributing to depression (21).

Long and irregular night shifts hours negatively affect nurses' physical and psychological aspects, personal and social life, performance and efficiency. They are contributing factors to depression among nurses. Portela et al. found that there is a relationship between night shifts and nurses' depression (22). Shifts can cause physical and psychological after-effects resulting in a reduction in people's efficiency and capability of doing work. Depression as an after-effect of night shifts can lead to nurses' low efficiency. A lot of research have shown the correlation between depression and shifts, especially night shifts (6, 22, 23). As shown by Ruggiero et al., night shifts can develop or even exacerbate sleep disorder, and on the other hand, there is a relationship between sleep disorder, affective disorder, and depression (23), so a direct relation exists between increased working hours and depression, which is consistent with our findings (24, 25).

As we found, there is a relationship between sex and nurse's depression as depression has been revealed to be more common in women than men. According to research conducted in the U.S. and Europe, about 9% - 21% of women and 5% - 12% of men go through depression in their life span. Baba et al. found that there is a significant relationship between depression and nurses' sex which is in accord with our findings (3, 26). This difference is probably due to more emotionally engagement of female nurses as well as their hormonal differences (26, 27). Rovner et al. found in their study that there is a significant relationship between nurses' age and depression,

which is similar with findings of the present study (28).

Evaluating anxiety and depression among nurses, Teresi et al. argued that working hours, education, number of children, and their age are the main factors related to the nurses' depression, but no relationship was found between the nurses' gender and depression (29). It seems that with increasing age, due to decreased energy and more engagement, people's social interaction and communication accordingly decline and their physical problems increase which may explain the relationship between age and depression, as physical and psychological issues are intertwined (23, 25, 29).

Mental component is a factor affecting depression as better mental health can give rise to increase in trust and cohesion and prevent depression, thus, it is essential to make plans for people's psychological improvement and nurses, in particular. Promoting mental health is considered the index of social system efficiency which is, in practice, measured through the appraisal of people's life in community. Policy makers and planners should promote nurses' quality of life with the available resources. Given the psychological and physical after-effects of night shifts as a contributing factor to depression, careful plans are necessary for reducing night shifts hours. Nurses' physical health is also an important factor in depression as the better a nurse's physical health, the lower the incidence of depression. In this regard, focusing on physical health through a healthy life style could be helpful. Direct effects of quality of life (mental and physical components), marital status, night shifts, and overtime are important findings yielded from path analysis which makes it essential for policy makers and health care officials to closely concentrate on them. Further research can help scrutinize the relationship between depression and quality of life among nursing community.

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Authors' Contributions

The overall implementation of this study, including design, data analysis, and manuscript preparation was the result of joint efforts of all coauthors of this paper. All authors have made extensive contributions to the review and finalization of this manuscript.

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References

- Lambert VA, Lambert CE, Itano J, Inouye J, Kim S, Kuniviktikul W, et al. Cross-cultural comparison of workplace stressors, ways of coping and demographic characteristics as predictors of physical and mental health among hospital nurses in Japan, Thailand, South Korea and the USA (Hawaii). *Int J Nurs Stud*. 2004;**41**(6):671-84.
- Suzuki K, Ohida T, Kaneita Y, Yokoyama E, Miyake T, Harano S, et al. Mental health status, shift work, and occupational accidents among hospital nurses in Japan. *J Occup Health*. 2004;**46**(6):448-54.
- Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*. 2002;**288**(16):1987-93.
- Chen YM, Chen SH, Tsai CY, Lo LY. Role stress and job satisfaction for nurse specialists. *J Adv Nurs*. 2007;**59**(5):497-509.
- Pender N, Murdaugh CL, Parsons MA. The health promotion model. *Health Promot Nurs Pract*. 2002;**4**:59-79.
- Lambert VA, Lambert CE, Ito M. Workplace stressors, ways of coping and demographic characteristics as predictors of physical and mental health of Japanese hospital nurses. *Int J Nurs Stud*. 2004;**41**(1):85-97.
- Autnfm RD. Depression: America's declining depression. *J Ment Health*. 1993;**6**:65-78.
- Cooney GM, Dwan K, Greig CA, Lawlor DA, Rimer J, Waugh FR, et al. Exercise for depression. *Cochrane Database Syst Rev*. 2013;**9**(4):CD004366.
- Crawford JR, Henry JD. The depression anxiety stress scale. *Br J Psychol*. 2003;**42**:111-31.
- van der Feltz-Cornelis CM, van Os J, Knappe S, Schumann G, Vieta E, Wittchen HU, et al. Towards Horizon 2020: challenges and advances for clinical mental health research - outcome of an expert survey. *Neuropsychiatr Dis Treat*. 2014;**10**:1057-68.
- Patti E, Acosta J, Chavda A, Verma D, Marker M, Anzisi L. Prevalence of anxiety and depression among emergency department staff. *Nursing*. 2007;**48**(2):8.
- Padigos J. Promoting quality of life. *Nurs NZ*. 2014;**20**(4):26.
- Guyatt GH, Feeny DH, Patrick DL. Measuring health-related quality of life. *Ann Intern Med*. 1993;**118**(8):622-9.
- Addington-Hall J, Kalra L. Who should measure quality of life? *BMJ*. 2001;**322**(7299):1417-20.
- Rohani C, Abedi HA, Langius A. The Iranian SF-12 Health Survey Version 2 (SF-12v2): Factorial and convergent validity, internal consistency and test-retest in a healthy sample. *Iranian Reh J*. 2010;**8**(12):4-14.
- Ghassemzadeh H, Mojtabei R, Karamghadiri N, Ebrahimkhani N. Psychometric properties of a Persian-language version of the Beck Depression Inventory--Second edition: BDI-II-PERSIAN. *Depress Anxiety*. 2005;**21**(4):185-92.
- Glozah FN, Pevalin DJ. Social support, stress, health, and academic success in Ghanaian adolescents: a path analysis. *J Adolesc*. 2014;**37**(4):451-60.
- Alwin DF, Hauser RM. The decomposition of effects in path analysis. *American Soci Rev*. 1975;**2**:37-47.
- Colquitt JA, LePine JA, Noe RA. Toward an integrative theory of training motivation: a meta-analytic path analysis of 20 years of research. *J Appl Psychol*. 2000;**85**(5):678-707.
- Hille S. Nurse professionals viable in mental health care. *Aust Nurs Midwifery J*. 2014;**21**(11):50-1.
- McCorkle R, Siefert ML, Dowd MF, Robinson JP, Pickett M. Effects of advanced practice nursing on patient and spouse depressive symptoms, sexual function, and marital interaction after radical prostatectomy. *Urol Nurs*. 2007;**27**(1):65-77.
- Portela LF, Rotenberg L, Waissmann W. Self-reported health and sleep complaints among nursing personnel working under 12 h night and day shifts. *Chronobiol Int*. 2004;**21**(6):859-70.
- Ruggiero JS. Health, work variables, and job satisfaction among nurses. *J Nurs Adm*. 2005;**35**(5):254-63.
- Munakata M, Ichi S, Nunokawa T, Saito Y, Ito N, Fukudo S, et al. Influence of night shift work on psychologic state and cardiovascular and neuroendocrine responses in healthy nurses. *Hypertens Res*. 2001;**24**(1):25-31.
- Tennant C. Work-related stress and depressive disorders. *J Psychosom Res*. 2001;**51**(5):697-704.
- Baba VV, Galperin BL, Lituchy TR. Occupational mental health: a study of work-related depression among nurses in the Caribbean. *Int J Nurs Stud*. 1999;**36**(2):163-9.
- Hunkeler EM, Meresman JF, Hargreaves WA, Fireman B, Berman WH, Kirsch AJ, et al. Efficacy of nurse telehealth care and peer support in augmenting treatment of depression in primary care. *Arch Fam Med*. 2000;**9**(8):700-8.
- Rovner BW, Casten RJ, Hegel MT, Leiby BE, Tasman WS. Preventing depression in age-related macular degeneration. *Arch Gen Psychiatry*. 2007;**64**(8):886-92.
- Teresi J, Abrams R, Holmes D, Ramirez M, Eimicke J. Prevalence of depression and depression recognition in nursing homes. *Soc Psychiatry Psychiatr Epidemiol*. 2001;**36**(12):613-20.