Alexithymia and Its Relationships with Job Burnout, Personality Traits, and shift work among Hospital Nurses: A Cross-Sectional Study

Zainabeh Saeidi, Hossein Ebrahimi, Hossein Namdar Areshtanab, Faranak Jabbarzadeh Tabrizi, Ali Mostafazadeh

Background: Due to the characteristics of their work, nurses experience high levels of stress and burnout. Alexithymia (defined as the inability to identify and express emotions) and personality traits can be risk factors for burnout. However, there is limited information about the relationships of alexithymia and personality traits with burnout among Iranian nurses.

Objective: This study examined the relationships between alexithymia, personality traits, job burnout, and shift work among hospital nurses in Iran.

Methods: This cross-sectional study was conducted in 2017 on a random sample of 225 nurses recruited from 10 hospitals affiliated to Tabriz University of Medical Sciences, Tabriz, Iran. Data collection instruments were the Toronto Alexithymia Scale, the Maslach Burnout Inventory, the Neuroticism, Extraversion, Openness Five-Factor Inventory, and a demographic questionnaire. Pearson’s correlation analysis, independent-samples t-test, one-way analysis of variance, and multiple linear regression analysis were used for data analysis.

Results: The mean scores of alexithymia and burnout were 56.78 ± 8.64 and 49.78 ± 13.67, respectively, and these two variables were significantly correlated (r = 0.258; P < 0.001). Alexithymia also had significant relationships with gender (P = 0.035), employment status (P = 0.045), and personality trait (P < 0.01) but had no significant relationship with shift schedule (P > 0.05).

Conclusion: Nurses with higher levels of alexithymia are more at risk for burnout. As alexithymia has significant relationships with gender and employment status, interventions are needed, especially for women, to alleviate their alexithymia and burnout.

Keywords: Alexithymia, Burnout, Nursing, Personality trait, Shift work
It can also negatively affect the quality of nursing care services and thereby may pose threats to health-care systems.[7]

Alexithymia has been reported to contribute to burnout. By definition, alexithymia is a personality trait characterized by poor ability to identify and express emotions.[6] Individuals with alexithymia cannot properly manage and regulate their emotions and usually express them through destructive nonverbal behaviors such as crying, breaking objects, alcohol consumption, and drug abuse.[9] Alexithymia has direct relationships with depression, anxiety, and somatic diseases.[10] Together with its associated problems, alexithymia can reduce productivity and efficiency among nurses and thereby negatively affect care quality.

Personality traits are another factor affecting burnout.[11,12] The effects of personality traits are more apparent among individuals with alexithymia.

There are limited studies on the relationship between alexithymia and burnout. A study in this area reported that alexithymia has a significant direct relationship with burnout.[13] However, none of the previous studies evaluated the relationships of alexithymia with personality traits and shift work among nurses in Iran. This study was conducted to fill this gap.

**Objectives**

This study examined the relationships of alexithymia with personality traits, job burnout, and shift work among hospital nurses in Iran.

**METHODS**

**Design and participants**

This cross-sectional study was conducted in hospitals affiliated to Tabriz University of Medical Sciences, Tabriz, Iran. Initially, ten hospitals were selected, and a random sample of nurses was selected from each hospital using the list of all nurses in that hospital. The selected hospitals were Imam Reza, Shahid Madani, Razi, Shohada, Sina, Alzahra, Taleghani, Nikoukari, Alavi, and Koodakan Hospitals. The inclusion criteria were an age of 22–50, a clinical work experience of more than 6 months in the study setting, no history of known psychiatric disorders, no history of taking psychiatric medications, and no history of significant life events during the past 6 months (such as road accidents or significant losses). The only exclusion criterion was unwillingness to stay in the study.

The sample size was calculated using the results of a former study which reported that the mean score of alexithymia was 46.84 ± 13.37.[13] Accordingly, with a confidence level of 95%, and using the sample size formula

\[ n = \left( \frac{Z_{1-\alpha/2}}{d} \right)^2 \frac{S^2}{d^2} \]  

\[ n = \left( \frac{1.96}{1.75} \right)^2 \frac{13.37^2}{1.75^2} = 225 \]  

a sample of 225 nurses was identified to be needed for the study.

**Instruments**

Data collection instruments were the Toronto Alexithymia Scale (TAS),[14] the Maslach Burnout Inventory (MBI),[15] the Neuroticism, Extraversion, Openness Five-Factor Inventory (NEO5F), and a demographic questionnaire.

The TAS is a self-report scale with 20 items in three dimensions, namely difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking. Positively worded items are scored from 1 to 5 and negatively worded items (i.e., items 4, 5, 10, 18, and 19) are scored from 5 to 1. The possible total score of the scale can vary in the range of 20–100.[16] We used the Persian version of this scale, the psychometric properties of which were confirmed with a Cronbach’s alpha of 0.85 in a former study.[17]

The 22-item MBI assesses burnout in three dimensions, namely emotional exhaustion (i.e., the frequency of emotional stress due to work), depersonalization (i.e., indifference and impersonality toward patients), and lack of personal achievement (i.e., senses of insufficiency, inefficiency, and nonachievement at work). These three dimensions include nine, five, and eight items, respectively. Each item is scored from 0 (“never”) to 6 (“everyday”), resulting in a possible total score of 0–132. This scale has acceptable validity for burnout assessment[13] and a Cronbach’s alpha of 0.86.[18]

The NEO5F includes sixty items on five personality traits, namely neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Each of these traits is assessed with 12 items which are scored on a Likert scale from 0 (“completely disagree”) to 4 (“completely agree”), resulting in a total dimensional score of 0–48. A former study reported that the Cronbach’s alpha values of the five dimensions of this inventory were 0.75–0.81.[19]

The demographic questionnaire of the study included items on participants’ age, gender, marital status, education level, employment status, affiliated hospital ward, doing extra shift, organizational position, and shift schedule (fixed or rotating).

Study instruments were given to participants at the beginning of one of their work shifts, and they were asked to complete it in a private environment and return it back to the researcher at her next referral.

**Ethical considerations**

The necessary ethical approval for this study was obtained from the Ethics Committee of Tabriz University.
of Medical Sciences, Tabriz, Iran (code: IR.TBZMED.REC.1397.017). All the questionnaires were unnamed. The objectives of the study were explained to participants, and they were informed of their rights to voluntarily participate in or withdraw from the study. All participants signed written informed consent for participation.

**Data analysis**

All data were analyzed through the SPSS software version 10.0 (SPSS Inc., Chicago, IL, USA). Numerical data were described through mean and standard deviation, whereas categorical data were described through absolute and relative frequencies. To calculate the normalized mean, the sum of the scores obtained from each dimension was divided by the number of questions in that dimension. Relationships among the study variables were examined using the Pearson’s correlation analysis. Independent-samples t-test and one-way analysis of variance were performed to examine the differences in the alexithymia andburnout mean scores in terms of different categories of demographic variables. Moreover, multiple linear regression analysis with backward method was performed to predict the mean score of alexithymia based on personality traits, burnout and its dimensions, and demographic characteristics (including age, gender, education level, employment status, and weekly work hours). All analyses were performed at a significance level of <0.05.

### Table 1: Participants’ characteristics and their total mean scores of burnout and alexithymia

| Characteristics               | n (%) | Burnout, mean ± SD | P-value | Alexithymia, mean ± SD | P-value |
|------------------------------|-------|--------------------|---------|------------------------|---------|
| Gender                       |       |                    |         |                        |         |
| Male                         | 86 (36.6) | 50.11 ± 11.7 | 0.042<sup>a</sup> | 52.67 ± 8.45 | 0.035<sup>a</sup> |
| Female                       | 149 (63.4) | 49.67 ± 14.2 |        | 54.35 ± 8.65 |         |
| Age (years)                  |       |                    |         |                        |         |
| 20-29                        | 121 (51.5) | 48.95 ± 14.6 | 0.470<sup>b</sup> | 56.55 ± 8.93 | 0.575<sup>b</sup> |
| 30-39                        | 88 (37.4) | 51.25 ± 11.8 |        | 56.77 ± 8.75 |         |
| ≥40                          | 26 (11.1) | 50.19 ± 12.1 |        | 58.46 ± 6.8 |         |
| Marriage status              |       |                    |         |                        |         |
| Single                       | 92 (39.1) | 49.96 ± 15.2 | 0.990<sup>a</sup> | 57.42 ± 9.61 | 0.375<sup>a</sup> |
| Married                      | 143 (60.1) | 49.94 ± 12.0 |        | 111.66 ± 7.9 |         |
| Educational level            |       |                    |         |                        |         |
| Associate                    | 12 (5.1) | 56.32 ± 9.41 | 0.036<sup>b</sup> | 55.54 ± 11.8 | 0.835<sup>b</sup> |
| Bachelor’s                   | 198 (84.3) | 49.30 ± 13.5 |        | 56.90 ± 8.42 |         |
| Master’s or PhD              | 25 (10.6) | 47.41 ± 11.7 |        | 56.36 ± 9.02 |         |
| Employment status            |       |                    |         |                        |         |
| Permanent                    | 69 (29.4) | 52.27 ± 13.7 | 0.013<sup>b</sup> | 57.62 ± 7.93 | 0.045<sup>b</sup> |
| Conditional                  | 76 (32.3) | 48.76 ± 11.4 |        | 55.1 ± 7.94 |         |
| Contractual                  | 20 (8.5) | 56.45 ± 17.8 |        | 60.8 ± 1059 |         |
| Experience (years)           |       |                    |         |                        |         |
| 1‑10                         | 165 (70.2) | 46.93 ± 12.0 | 0.712<sup>a</sup> | 56.56 ± 8.8 | 0.578<sup>a</sup> |
| ≥11                          | 70 (29.8) | 51.33 ± 9/7 |        | 57.25 ± 9.0 |         |
| Affiliated ward              |       |                    |         |                        |         |
| Critical care unit           | 101 (43) | 51.16 ± 12.7 | 0.021<sup>b</sup> | 57.04 ± 7.33 | 0.189<sup>b</sup> |
| Emergency room               | 26 (11) | 46.03 ± 14.0 |        | 55.88 ± 8.07 |         |
| General ward                 | 108 (46) | 49.75 ± 13.6 |        | 56.73 ± 9.9 |         |
| Official position            |       |                    |         |                        |         |
| Nurse manager                | 24 (10.66) | 53.20 ± 9.93 | 0.270<sup>a</sup> | 58.20 ± 8.87 | 0.392<sup>a</sup> |
| Staff nurse                  | 201 (89.34) | 49.58 ± 13.6 |        | 56.61 ± 8.62 |         |
| Work hours per week          |       |                    |         |                        |         |
| 44                           | 112 (47.7) | 49.56 ± 13.9 | 0.669<sup>a</sup> | 56.04 ± 8.3 | 0.218<sup>a</sup> |
| ≥45                          | 123 (52.3) | 50.3 ± 12/8 |        | 57.43 ± 8.92 |         |
| Doing extra shift            |       |                    |         |                        |         |
| Yes                          | 213 (90.6) | 56.22 ± 15.6 | 0.002<sup>a</sup> | 56.57 ± 8.4 | 0.369<sup>a</sup> |
| No                           | 22 (9.4) | 49.3 ± 18.26 |        | 58.72 ± 10.7 |         |
| Shift schedule               |       |                    |         |                        |         |
| Fixed                        | 107 (45.5) | 44.38 ± 14.5 | 0.044<sup>a</sup> | 56.92 ± 8.18 | 0.805<sup>a</sup> |
| Rotating                     | 128 (54.5) | 50.46 ± 12.2 |        | 56.64 ± 9.05 |         |

<sup>a</sup>The results of independent-samples t-test, <sup>b</sup>The results of the one-way analysis of variance. SD: Standard deviation
RESULTS

In total, 225 nurses participated in the present study. The means of their age and work experience were 31.23 ± 6.77 and 7.2 ± 6.48 years, respectively. As Table 1 shows, most of them were female (63.4%), younger than 39 years (88.9%), and married (61%). A majority of the participants had a work experience of <10 years (71%), held bachelor’s degree (84.3%), did rotating shifts (54.4%), and had extra shifts (90.6%).

The mean scores of alexithymia and burnout were 56.78 ± 8.64 and 49.78 ± 13.67, respectively [Table 2]. The highest mean scores of burnout dimensions were related to the externally oriented thinking (3.28 out of 5) and the depersonalization (3.42 out of 6) dimensions.

Table 2: The mean scores of alexithymia, burnout, their dimensions, and personality traits

| Variables                              | Mean ± SD | Normalized mean score |
|----------------------------------------|-----------|-----------------------|
| Alexithymia                            |           |                       |
| Difficulty identifying feelings        | 16.48 ± 5.16 | 2.35                 |
| Difficulty describing feelings         | 13.97 ± 2.52 | 2.79                 |
| Externally oriented thinking           | 26.31 ± 4.10 | 3.28                 |
| Total                                  | 56.78 ± 8.64 | 2.83                 |
| Burnout                                |           |                       |
| Emotional exhaustion                   | 14.11 ± 8.54 | 1.56                 |
| Depersonalization                      | 5.48 ± 4.72  | 3.42                 |
| Personal accomplishment                | 27.39 ± 7.13 | 2.35                 |
| Total                                  | 49.78 ± 13.67 | 2.26                 |
| Personality traits                     |           |                       |
| Neuroticism                            | 22.73 ± 6.14 | 1.89                 |
| Extroversion                           | 26.44 ± 5.05 | 2.20                 |
| Openness to experience                 | 24.65 ± 4.86 | 2.05                 |
| Agreeableness                          | 25.15 ± 5.07 | 2.09                 |
| Conscientiousness                      | 27.64 ± 4.77 | 2.30                 |

SD: Standard deviation

The highest dimensional mean score in the personality trait inventory was also related to the conscientiousness dimension (2.3 out of 4).

The total score of alexithymia had significant positive correlations with the scores of job burnout and its emotional exhaustion and depersonalization dimensions ($P < 0.001$). Moreover, the total score of alexithymia had significant direct correlations with the neuroticism and the openness to experience personality traits and significant indirect correlations with the agreeableness, extroversion, and conscientiousness personality traits ($P < 0.05$) [Table 3].

The total mean scores of job burnout were significantly different among the participants with different age groups, education levels, employment status, doing extra shifts, and shift schedules [$P < 0.05$; Table 1]. The total mean scores of alexithymia were also significantly different among participants with different genders and employment status [$P < 0.05$; Table 1]. However, the differences of alexithymia and its dimensions scores were statistically insignificant for participants with different shift schedules [$P < 0.05$; Table 1].

Preliminary analysis revealed no violation of the assumptions of normality, linearity, and multicollinearity. The results of regression analysis showed that job burnout and its emotional exhaustion and depersonalization dimensions as well as the neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness personality traits were significant predictors of alexithymia, accounting for 70% of its total variance ($P = 0.001$). The highest beta value was related to the agreeableness personality trait ($\beta = 0.621$; $P = 0.001$; Table 4).

Table 3. Pearson’s correlation coefficients of the correlations of alexithymia and its dimensions with burnout, its dimensions, and personality traits

| Variable                              | Difficulty identifying feelings | Difficulty describing feelings | Externally oriented thinking | Total  |
|----------------------------------------|---------------------------------|---------------------------------|-------------------------------|--------|
| Burnout                                | 0.375*                          | 0.135*                          | 0.091*                        | 0.220* |
| Emotional exhaustion                   | 0.367*                          | 0.281*                          | 0.087*                        | 0.260* |
| Depersonalization                      | 0.166*                          | 0.014*                          | 0.244*                        | 0.021* |
| Personal accomplishment                | 0.318*                          | 0.196*                          | 0.022*                        | 0.258* |
| Personality traits                     |                                 |                                 |                               |        |
| Neuroticism                            | 0.431*                          | 0.258*                          | 0.119*                        | 0.389* |
| Extroversion                           | −0.026*                         | −0.312*                         | −0.361*                       | −0.278*|
| Openness to experience                 | 0.119                           | 0.268*                          | 0.331*                        | 0.306* |
| Agreeableness                          | −0.261*                         | −0.197*                         | −0.204*                       | −0.257*|
| Conscientiousness                      | −0.007*                         | −0.228*                         | −0.301*                       | −0.201*|

*Statistically significant at a $P<0.001$, *Statistically significant at a $P<0.01$, *Statistically significant at a $P<0.05$
Individuals with alexithymia and low perceived social support lack the ability to express their emotions. They cannot properly communicate their experiences of stress, which can lead to heightened stress levels. Furthermore, those with low perceived social support tend to avoid seeking emotional support, which can perpetuate the cycle of emotional strain.

Lack of perceived social support can be a significant predictor of burnout and alexithymia. A former study also reported the same finding. In this study, the total score of burnout among nurses working in rotating shifts was significantly higher than that of nurses working in fixed shifts. The relationship of shift schedule with burnout can be attributed to the fact that nurses with rotating shifts have a higher workload and thus experience higher levels of job burnout. In addition, our findings showed that lower education level and employment status were associated with higher levels of burnout. These findings are in line with the findings of a former study. An explanation for these findings is that nurses with better employment status may have fewer concerns about the loss of jobs and hence feel lower levels of job burnout. Moreover, those with higher education level probably have more ability in properly expressing their emotions and feel lower levels of emotional exhaustion.

Study findings also showed an indirect relationship between alexithymia and extroversion. A former study also reported the same finding and concluded that extroversion can be a protective factor against alexithymia. Moreover, those with extroversion personality trait are less vulnerable to alexithymia probably due to the fact that they are more likely to experience positive emotions, are kinder and more sociable and hence, have more ability to express their emotions.

In line with the findings of an earlier study, our findings indicated that alexithymia had significant relationships with personality traits. According to the results of regression analysis, higher levels of burnout and neuroticism were associated with higher levels of alexithymia. Neurotic individuals are more reactive to stressors and are more likely to experience embarrassment, irritating thoughts, depression, and low self-esteem. They cannot properly express their emotions and hence are at risk for burnout. Therefore, they may benefit from individualized strategies such as cognitive behavioral therapy and relaxation techniques which can decrease their negative emotional responses as well as from work-oriented interventions (such as role-playing) which improve their attitudes and communication skills.

**Discussion**

Study findings revealed a positive relationship between burnout and alexithymia so that those with more severe alexithymia had higher levels of job burnout. Alexithymia is associated with life dissatisfaction and low perceived social support. Lack of perceived support at workplace can also negatively affect work environment and thereby may end in job burnout.

The results of regression analysis indicated that job burnout and its emotional exhaustion and depersonalization dimensions were among the significant predictors of alexithymia. A former study also reported the same finding. Alexithymia is a risk factor for many psychiatric disorders because those with alexithymia are under higher levels of physical and emotional stress. Individuals with alexithymia have limited ability to establish healthy interpersonal relationships at workplace. Conversely, those who feel that they receive greater support from their colleagues and supervisors are more resistant to job burnout.

Our findings also showed that female nurses were more at risk for alexithymia and burnout than their male counterparts. This finding is consistent with the findings of a former study on Chinese adolescents. An explanation for this finding may be the greater independence of male nurses compared with female nurses. These findings denote gender differences respecting vulnerability to alexithymia and burnout.

In the present study, the total score of burnout among nurses working in rotating shifts was significantly higher than that of nurses working in fixed shifts. The significant relationship of shift schedule with burnout can be attributed to the fact that nurses with rotating shifts have a higher workload and thus experience higher levels of job burnout. In addition, our findings showed that lower education level and employment status were associated with higher levels of burnout. These findings are in line with the findings of a former study. An explanation for these findings is that nurses with better employment status may have fewer concerns about the loss of jobs and hence feel lower levels of job burnout. Moreover, those with higher education level probably have more ability in properly expressing their emotions and feel lower levels of emotional exhaustion.

Study findings also showed an indirect relationship between alexithymia and extroversion. A former study also reported the same finding and concluded that extroversion can be a protective factor against alexithymia. Moreover, those with extroversion personality trait are less vulnerable to alexithymia probably due to the fact that they are more likely to experience positive emotions, are kinder and more sociable and hence, have more ability to express their emotions.

In line with the findings of an earlier study, our findings indicated that alexithymia had significant relationships with personality traits. According to the results of regression analysis, higher levels of burnout and neuroticism were associated with higher levels of alexithymia. Neurotic individuals are more reactive to stressors and are more likely to experience embarrassment, irritating thoughts, depression, and low self-esteem. They cannot properly express their emotions and hence are at risk for burnout. Therefore, they may benefit from individualized strategies such as cognitive behavioral therapy and relaxation techniques which can decrease their negative emotional responses as well as from work-oriented interventions (such as role-playing) which improve their attitudes and communication skills.
Our findings also showed that both alexithymia and personality traits were associated with burnout. This is in agreement with the findings of a former study which showed the significant relationship of burnout with alexithymia and personality traits among physicians and proposed alexithymia as an independent risk factor for burnout. Another study also showed that the level of burnout may vary according to personality traits.

Due to the cross-sectional design of the study, the identified causal relationships are not very reliable and require further investigation. Moreover, although the sample of the study was representative of nurses in public hospitals in Tabriz, Iran, findings may not be generalizable to all nurses in Iran and also to nurses in private hospitals. Data collection through the self-report method might have resulted in recall bias. Future studies are recommended to use other data collection methods (such as interview) to collect more in-depth data. Despite these limitations, this study provides some evidence about the relationships of alexithymia, job burnout, personality traits, and shift schedule.

**CONCLUSION**

This study concludes that nurses with more severe alexithymia are more at risk for job burnout. Moreover, female nurses and those with lower employment status and educational levels are at risk for alexithymia and job burnout. Therefore, developing nurses’ communication skills and their ability to express their emotions may help prevent or alleviate job burnout among them. Nursing managers and policymakers can develop and use educational and intervention programs to increase the quality of work-life among nurses to reduce alexithymia and subsequent burnout.

**Acknowledgment**

This article was derived from a master thesis of Zainabeh Saeidi with project number IR.tbzmed.VCR.REC.1397.017, Tabriz University of Medical Sciences, Tabriz, Iran. The authors would like to acknowledge the research deputy at Tabriz University of Medical Sciences for their support. We also are thankful for all nurses who participated in this study.

**Financial support and sponsorship**

This study was financially supported by research deputy at Tabriz University of Medical Sciences (Ethics code: IR.TBZMED.REC.1397.017). This article was derived from a thesis research project.

**Conflicts of interest**

There are no conflicts of interest.

**REFERENCES**

1. Cherniss C. Beyond Burnout: Helping Teachers, Nurses, Therapists and Lawyers Recover From Stress and Disillusionment. London: Routledge; 2016.
2. Ferri P, Guadi M, Marcheselli L, Balduzzi S, Magnani D, Di Lorenzo R. The impact of shift work on the psychological and physical health of nurses in a general hospital: A comparison between rotating night shifts and day shifts. Risk Manag Healthc Policy 2016;9:203-11.
3. Erkorkmaz U, Dogu O, Cinar N. The relationship between burnout, self-esteem and professional life quality of nurses. J Coll Physicians Surg Pak 2018;28:549-53.
4. Marcum K, Rusnak T, Koch M. A Systematic Review: Factors for Burnout and Compassion Fatigue in US Nurses. Honors Res Projects 617; 2018. Available from: http://ideaexchange.uakron.edu/honors_research_projects/617. [Last accessed on 2019 Oct 10].
5. Mashego TA, Nesengani DS, Ntuli T, Wyatt G. burnout, compassion fatigue and compassion satisfaction among nurses in the context of maternal and perinatal deaths. J Psychol Afr 2016;26:469-72.
6. Laschinger HK, Fida R. New nurses burnout and workplace wellbeing: The influence of authentic leadership and psychological capital. Burnout Res 2014;1:19-28.
7. Dyrybe LN, Shanafelt TD, Sinsky CA, Cipriano PF, Bhatt J, Ommaya A, et al. Burnout among Health Care Professionals: A Call to Explore and Address this Underrecognized Threat to Safe, High-Quality Care. Perspective; 2017. p. 1-11. Available from: https://nam.edu/burnout-among-health-care-professionals-a-call-to-explore-and-address-this-underrecognized-threat-to-safe-high-quality-care/. [Last accessed on 2019 Oct 10].
8. Kafetioso K, Hess U. Seeing mixed emotions: Alexithymia, emotion perception bias, and quality in dyadic interactions. Pers Indiv Differ 2019;137:80-5.
9. Luminet O, Bagby RM, Taylor GJ. Alexithymia: Advances in Research, Theory, and Clinical Practice. Cambridge: Cambridge University Press; 2018.
10. Aaron RV, Fisher EA, de la Vega R, Lumley MA, Palermo TM. Alexithymia in individuals with chronic pain and its relation to pain intensity, physical interference, depression, and anxiety: A systematic review and meta-analysis. Pain 2019;160:994-1006.
11. Barr P. The five-factor model of personality, work stress and professional quality of life in neonatal intensive care unit nurses. J Adv Nurs 2018;74:1349-58.
12. Mojsa-Kaja J, Golonka K, Marek T. Job burnout and engagement among teachers-worklife areas and personality traits as predictors of relationships with work. Int J Occup Med Environ Health 2015;28:102-19.
13. Bratis D, Tselebis A, Sikaras C, Moulou A, Giotakis K, Zoumakis E, et al. Alexithymia and its association with burnout, depression and family support among greek nursing staff. Hum Resour Health 2009;7:72.
14. Khamisa N, Oldenburg B, Peltzer K, Ilic D. Work related stress, burnout, job satisfaction and general health of nurses. Int J Environ Res Public Health 2015;12:652-66.
15. Federici C, Petrucci F, Caimi S, Cesolini A. Loiogozzi M, Borghi M, et al. Exosome release and low pH belong to a framework of resistance of human melanoma cells to cisplatin. PLoS One 2014;9:e88193.
16. Taylor GJ, Bagby RM, Ryan DP, Parker JD, Doody KF, Keefe P. Criterion validity of the toronto alexithymia scale. Psychosom Med 1988;50:500-9.
17. Besharat M. Toronto alexithymia scale: Questionnaire, instruction.
and scoring. Dev Psychol. 2013;37:90-2.

18. Sahebzadeh M, Karimi S, Hosseini SM, Akhtar-Danesh G, Hosseini S. Job burnout of nursing administrators and chief executive officers in university hospitals and its relation to their demographic features. Health Inf Manag 2011;7:637-48.

19. Babay-Khakian Z, Karami J, Rashidi A. Alexithymia, personality factors and relationship with job burnout of female teachers. Q J Adv Psychol Res 2015;10:20-1.

20. Shibata M, Ninomiya T, Jensen MP, Anno K, Yonemoto K, Makino S, et al. Alexithymia is associated with greater risk of chronic pain and negative affect and with lower life satisfaction in a general population: The Hisayama Study. PLoS One 2014;9:e90984.

21. Saikkonen S, Karukivi M, Vahlberg T, Saarijärvi S. Associations of social support and alexithymia with psychological distress in Finnish young adults. Scand J Psychol 2018;59:602-9.

22. Khadabakhsh M, Mansouri P. Investigating correlation between Alexithymia and demographic variables with job burnout among nurses. Bimon J Hormozgan Univ Med Sci 2012;16:151-61.

23. Gui Y, Yao G, Zhao J, Shuwen L. Study on alexithymia and perceived stress in nursing staff. Chin J Pract Nurs 2013;29:9-12.

24. Besharat MA. Relationship of alexithymia with coping styles and interpersonal problems. Procedia Soc Behav Sci 2010;5:614-18.

25. Hamaideh SH. Burnout, social support, and job satisfaction among Jordanian mental health nurses. Issues Ment Health Nurs 2011;32:234-42.

26. Chen ZS, Chung MC. The relationship between gender, posttraumatic stress disorder from past trauma, alexithymia and psychiatric co-morbidity in Chinese adolescents: A moderated mediational analysis. Psychiatr Q 2016;87:689-701.

27. Adriaenssens J, De Gucht V, Maes S. Determinants and prevalence of burnout in emergency nurses: A systematic review of 25 years of research. Int J Nurs Stud 2015;52:649-61.

28. Kabir MJ, Heidari A, Etemad K, Gashiti AB, Jafari N, Honarvar MR, et al. Job burnout, job satisfaction, and related factors among health care workers in Golestan Province, Iran. Electron Physician 2016;8:2924-30.

29. Ang SY, Dhaliwal SS, Ayre TC, Uthaman T, Fong KY, Tien CE, et al. Demographics and personality factors associated with burnout among nurses in a Singapore tertiary hospital. Biomed Res Int 2016;2016:1-12.

30. Rosenberg N, Rufer M, Lichev V, Ihme K, Grabe HJ, Kugel H, et al. Observer-rated alexithymia and its relationship with the five-factor-model of personality. Psychol Belg 2016;56:118-34.

31. Mantani T, Okamoto Y, Shirao N, Okada G, Yamawaki S. Reduced activation of posterior cingulate cortex during imagery in subjects with high degrees of alexithymia: A functional magnetic resonance imaging study. Biol Psychiatry 2005;57:982-90.

32. Atari M, Yaghoubirad M. The big five personality dimensions and mental health: The mediating role of alexithymia. Asian J Psychiatr 2016;24:59-64.

33. Guo Q, Sun P, Li L. Why neurotic individuals are less prosocial? A multiple mediation analysis regarding related mechanisms. Pers Indiv Diff 2018;128:55-61.

34. Spinhoven P, Huijbers MJ, Ormel J, Speckens AE. Improvement of mindfulness skills during mindfulness-based cognitive therapy predicts long-term reductions of neuroticism in persons with recurrent depression in remission. J Affect Disord 2017;213:112-17.

35. Taycan O, Taycan SE, Celik C. Relationship of burnout with personality, alexithymia, and coping behaviors among physicians in a semiurban and rural area in Turkey. Arch Environ Occup Health 2014;69:159-66.

36. Marek T, Schaufeli WB, Maslach C. Professional Burnout: Recent Developments in Theory and Research. New York: Routledge; 2017.