A Structural Equation Modeling of the Relationship Between Occupational Stress and Job Performance in Health Care Workers

SIAVASH ETEMADINEZHAD1, SEYED EHSAN SAMAEI2, JAMSHID YAZDANI CHARATTI3, ZEINAB MOHAJER ASTARABADI4*

1Associate Professor, Department of Occupational Health, Mazandaran University of Medical Sciences, Sari, Iran; 2PhD Student, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran; 3Associate Professor, Department of Biostatistics, Mazandaran University of Medical Sciences, Sari, Iran; 4MSc of Ergonomic, Department of Occupational Health, Mazandaran University of Medical Sciences, Sari, Iran.

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ABSTRACT
Healthcare workers (HCWs) suffer from occupational stress. This stress has adverse effects on individual and organization. This factor can impose irreparable damage to the health care organizations and ultimately reduce job performance. The aim of this study was to investigate the effect of occupational stress on the performance of HCWs. This descriptive-analytical study was conducted in 2017, by-census on 400 health-care workers of one of the public hospitals in Gorgan, Iran. Data was collected using Osipow’s Occupational Stress Questionnaire and Paterson’s Job Performance Questionnaire. Descriptive, analytical statistics and Structural Equation Modeling (SEM) was analyzed by SPSS v. 22 and LISREL 8.72. The highest and lowest effect of stressful factors on job performance were related to physical environment (β=0.89, p<0.001) and the role insufficiency (β=0.43, p<0.001) respectively. The overall dimensions of occupational stress explained 73% of changes in the variance of job performance of HCWs (R-squared=0.73). One of the important interventions can be focusing on the improvement of the physical conditions of the workplace and maintaining this at standard levels.

KEYWORDS: Occupational stress, Job Performance, Health care workers

INTRODUCTION
Occupational stress is a psychological, physical and behavioral response that occurs when the job conditions do not match with the capabilities, facilities or requirements of the worker [1]. According to the NIOSH statistics, one-fourth of workers consider their jobs as one of the stressors in lifetime [2].Occupational stress is a growing problem around the world which has a deleterious effect on a wide range of physical and mental health outcomes [2].

In this regards, from the consequences related to the occupational stress; depression, anxiety, frustration, isolation and restlessness can be noted [3]. The factors such as organizational changes, communication with colleagues, work characteristics, salary and wage and declined manpower can increase the level of occupational stress [4-5]. Also, for workers who are exposed to higher occupational stress, symptoms such as alcohol consumption, indifference to work, and reduced incentive for working appear to be dominant [5-6].

Healthcare workers (HCWs) almost persistently suffer from occupational stress [7]. Studies have shown that 7.4% of the HCWs had absenteeism each week due to disability caused by stress, which is 80% more than other occupational groups [8]. Symptoms appearing in stressful situations may include mental, physical, and behavioral disorders that are usually developed by
occupational stress [7, 9]. Likewise, the research has highlighted that factors such as prolonged contact with patients, having heavy responsibilities, performing clinical processes, communicating with dying patients, dealing with emergency conditions and working long-term night shifts are the main stressors for HCWs. Continuous exposure to these factors, can reduce the quality of patient care and induce fatigue, depression and absenteeism of HCWs [10-11]. Neglecting the consequences of occupational stress can impose irreparable damage to the organization's human resources and ultimately decline the workers’ performance [11-12].

The results from the study conducted by Haidari (2013) showed that the occupational, individual and organizational stressors had the massive impact on HCWs' job performance [12]. Undoubtedly, identifying and evaluating the root causes of occupational stress in HCWs, can serve as an efficient tool for enhancing the productivity and preventing burnout [9, 13]. Based on evidence provided by Santiago, the occupational stress along with job dissatisfaction can reduce the working ability [14].

Due to the important role of the occupational stress in HCWs and lack of studies for determining the association of stressors in the form of a conceptual model, the present study was designed to identify the potential stressors and determine their relationship with HCW's job performance in the form of Structural Equation Modeling (SEM).

MATERIALS AND METHODS

Study design: This descriptive-analytical study was conducted among HCWs in one of the public hospitals in Gorgan (May to September 2017). The statistical population included all HCWs in this hospital. In general, in SEM, the sample size can determine with 5 or 10 observations per each parameter (number of questions of questionnaire)

\[
5q ≤ n ≤ 15q
\]

Where \(q\) is the number of question of questionnaire and \(n\) is the sample size [15]. Accordingly, with regard to the number of questions in Occupational Stress and Job Performance Questionnaire (75 questions), 400 HCWs were selected as the sample size by census method in different wards of the hospital. The inclusion criteria for the HCWs were full-time job, not having a second job, not having specific physical and mental problems (based on self-expression) and at least one year of work experience in the current employment. The exclusion criteria were no responding or incomplete questionnaires.

Data collection tool:

A) The demographic information and organizational characteristics included age, gender, section or workplace, total work experience, and education level of HCWs.

B) The Osipow’s Occupational stress questionnaire was first used by Osipow et al. in 1987. This questionnaire measures the occupational stress in six dimensions (role overload, role insufficiency, role ambiguity, role boundary, responsibility and physical environment). Each dimension contains 10 questions. The response format of this questionnaire, is based on a 5-point Likert-type scaling (never, rarely, sometimes, often and always) and the relevant scores are determined based on the instructions of the Osipow questionnaire. The validity and reliability of this questionnaire have been examined in numerous internal studies (in Iran) and the results indicated the desirable validity of this questionnaire[16, 17].

C) The Paterson’s Job Performance Questionnaire was used to survey the job performance. This questionnaire has 15 questions which measure the performance of workers in terms of their job and organizational responsibilities [18]. Each question of a four-state scale from rarely (1) to always (4) has been formed. The maximum score in this questionnaire is 60 and the minimum score is 15. The reliability of this questionnaire was verified in Vosoughi study (with Cronbach’s alpha 0.86) [19].

Ethical considerations: This study was approved by the Ethics Committee of Mazandaran University of Medical Sciences (IR.MAZUMS.REC.96.2826).

Data collection: having obtained the prior permission from Mazandaran University of Medical Sciences, the researchers went to hospital in various work shifts, in order to access and collect the data about all HCWs.

Statistical analysis: Descriptive and analytical statistics was performed to summarize the data. Also, the SEM was used to investigate the relationship between the hidden variables and observed variables and SPSS22 and LISREL 8.72 were used to analyze the data. The significance level was \(p<0.05\).

RESULT

The information of demographic and organizational variables of HCWs is listed in Table 1.
Table 1. Information of demographic and organizational variables of HCWs (n=400)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>220</td>
<td>55.00</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>180</td>
<td>45.00</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>263</td>
<td>65.75</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>137</td>
<td>34.25</td>
</tr>
<tr>
<td>Age (year)</td>
<td>20-29</td>
<td>152</td>
<td>38.00</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>153</td>
<td>38.25</td>
</tr>
<tr>
<td></td>
<td>≥50</td>
<td>86</td>
<td>21.50</td>
</tr>
<tr>
<td>Work experience (year)</td>
<td>5</td>
<td>142</td>
<td>35.00</td>
</tr>
<tr>
<td></td>
<td>5-10</td>
<td>58</td>
<td>14.75</td>
</tr>
<tr>
<td></td>
<td>10-15</td>
<td>115</td>
<td>28.75</td>
</tr>
<tr>
<td></td>
<td>&gt;15</td>
<td>84</td>
<td>21.00</td>
</tr>
</tbody>
</table>

The mean and standard deviation of occupational stress dimensions and job performance is showed in Table 2. Since in SEM, the data should follow a normal distribution [15], the Kolmogorov-Smirnov test was employed. Considering that the test value was more than 0.05, the variables were considered normal. Therefore parametric tests and SEM can be used to explain the model (Table 2).

Examining the research hypotheses: The results of SEM indicated that standardized coefficients (β) of occupational stress questionnaire and job performance questionnaire was higher than 0.04, indicating the influential effects of occupational stress dimensions on job performance (Fig. 1). Also, t-value was obtained to be 5.24, which is larger than the critical value (because the t-value was not within the range of -1.96 to +1.96). This indicates that the standardized coefficients of regression are significant. Therefore, with 95% confidence, there is a significant relationship between the stressor and the HCW’s performance (Fig. 2).

Table 2. Mean and standard deviation questionnaire items reported by HCWs (n=400)

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Variance</th>
<th>Kolmogorov–Smirnov</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role Overload (RO)</td>
<td>2.85</td>
<td>0.71</td>
<td>0.50</td>
<td>3.06</td>
</tr>
<tr>
<td>Role Insufficiency (RI)</td>
<td>2.96</td>
<td>0.79</td>
<td>0.62</td>
<td>2.06</td>
</tr>
<tr>
<td>Role Ambiguity (RA)</td>
<td>3.23</td>
<td>0.51</td>
<td>0.26</td>
<td>3.06</td>
</tr>
<tr>
<td>Role Boundary (RB)</td>
<td>3.21</td>
<td>0.47</td>
<td>0.22</td>
<td>3.08</td>
</tr>
<tr>
<td>Responsibility (R)</td>
<td>3.16</td>
<td>0.55</td>
<td>0.30</td>
<td>4.07</td>
</tr>
<tr>
<td>Physical Environment (PE)</td>
<td>3.07</td>
<td>0.49</td>
<td>0.24</td>
<td>3.07</td>
</tr>
<tr>
<td>Job Performance</td>
<td>4.06</td>
<td>0.61</td>
<td>0.38</td>
<td>2.58</td>
</tr>
</tbody>
</table>

Fig.1. standardized coefficients (β) of stressors in job performance of HCWs
Validation of the research model:
According to result, the $\chi^2$ was 1.88, which indicates a small difference between the conceptual model and the observed data. The NFI-NNFI-IFI-CFI index were greater than 0.9; and GFI and AGFI were greater than 0.8. Therefore, the model has an appropriate fit (Table 3).

<table>
<thead>
<tr>
<th>Fitting indexes</th>
<th>Full name</th>
<th>recommended amount</th>
<th>value</th>
<th>Confirm/Reject</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>Chi-square Divided</td>
<td>-</td>
<td>1186</td>
<td>Confirm</td>
</tr>
<tr>
<td>Df</td>
<td>Degrees of Freedom</td>
<td>-</td>
<td>631</td>
<td>Confirm</td>
</tr>
<tr>
<td>$\chi^2$/df</td>
<td>Chi-square Divided to Degrees of Freedom</td>
<td>$\chi^2$/df &lt; 3</td>
<td>1.88</td>
<td>Confirm</td>
</tr>
<tr>
<td>RMSEA</td>
<td>Root Mean Square Error of Approximation</td>
<td>RMSEA $\leq$ 0.10</td>
<td>0.047</td>
<td>Confirm</td>
</tr>
<tr>
<td>GFI</td>
<td>Goodness of Fit Index</td>
<td>GFI $&gt; 0.9$</td>
<td>0.92</td>
<td>Confirm</td>
</tr>
<tr>
<td>AGFI</td>
<td>Adjusted Goodness of Fit Index</td>
<td>AGFI $&gt; 0.9$</td>
<td>0.96</td>
<td>Confirm</td>
</tr>
<tr>
<td>NFI</td>
<td>Normed Fit Index</td>
<td>NFI $&gt; 0.9$</td>
<td>0.95</td>
<td>Confirm</td>
</tr>
<tr>
<td>IFI</td>
<td>Incremental Fit Index</td>
<td>IFI $&gt; 0.9$</td>
<td>0.97</td>
<td>Confirm</td>
</tr>
<tr>
<td>CFI</td>
<td>Comparative Fit Index</td>
<td>CFI $&gt; 0.9$</td>
<td>0.92</td>
<td>Confirm</td>
</tr>
</tbody>
</table>

The physical environment (with a standard coefficient of 0.89) and the role insufficiency (with a standard coefficient of 0.43) had the highest and lowest impact on the job performance, respectively. The coefficient of determination for the job performance variable was estimated as 73% ($R^2$=0.73), which is the indication of the fact that all dimensions of occupational stress (6 dimensions) were able to explain 73% of changes in the job performance (Table 4).

| Table 4. Summary of standard coefficient and significance level of the test |
|--------------------------|-----------------|-----------------|-----------------|
| Model                    | standardized coefficients ($\beta$) | t-value | Result          |
| 1                        | Physical Environment $\rightarrow$ Job Performance | 0.89    | 6.20 | confirm        |
| 2                        | Role Boundary $\rightarrow$ Job Performance | 0.80    | 3.41 | confirm        |
| 3                        | Responsibility $\rightarrow$ Job Performance | 0.76    | 5.36 | confirm        |
| 4                        | Role Ambiguity $\rightarrow$ Job Performance | 0.73    | 2.69 | confirm        |
| 5                        | Role Overload $\rightarrow$ Job Performance | 0.53    | 5.62 | confirm        |
| 6                        | Role Insufficiency $\rightarrow$ Job Performance | 0.43    | 3.12 | confirm        |

$R^2$=0.73

DISCUSSION
In this study, job related stress was evaluated based on the occupational stress questionnaire (with six dimensions). In this regard, the role ambiguity dimension ($3.23\pm0.51$) had the greatest mean among the other dimensions. This is consistent with the results reported by Yousefian et al. (2014) which had been conducted on HCWs of the hospitals in Zahedan. This means that the role ambiguity had the most significant effect on
increasing stress among studied HCWs [20]. HCWs due to the nature of their work, need to have job satisfaction and social support (coworker and supervisor support). If such conditions are not met, the levels of job dissatisfaction and role ambiguity will be escalated for them [21-22].

Based on the results, a significant relationship was found between the physical environment and job performance. Therefore, this stressor was introduced as the most important factor in the job performance among other stressors. Also, in Zakerian’s study (2015) a significant relationship between proper and high quality design of the physical environment and workers’ performance was reported. In other words designing an appropriate work environment by considering the individual demands and job satisfaction components, increases the productivity of workers [23]. Moreover, in a study conducted on HCWs in Kermanshah (west of Iran), improving the welfare state and physical environment was suggested for enhancing the performance. [24]. On the other hand, one of the most important effects of an inappropriate physical environment is inflicting physiological challenges on workers. Providing a suitable physical environment is recommended to improve the job performance of workers. The results of psychological research on the impact of the physical conditions of the workplace on the workers' job performance indicated that appropriate physical conditions at the workplace will improve the productivity of workers and enhance their quality of work. [25-28].

The role boundary and role ambiguity as other strong and influential variables related to job performance, was reported in the present study. In this regard, a significant relationship was established between these variables and the HCWs job performance. The cognition of work scopes, tasks and the roles of individual in work environment depends on the lack of dichotomy and ambiguity of the role. Role ambiguity is one of the stressors in the work environment for which the necessary information for performing a job is improper and misleading[29]. In this situation, recognition of the job demands and job authority is disturbed. Increased occupational stress due to role ambiguity and role boundary is associated with decreased job performance as well as job satisfaction, which ultimately contributes to decreased productivity of workers and excessive costs for the organization [30]. The unclear tasks will make the workers disappointed for doing work and accepting responsibility. In these conditions, the decline in productivity will occur.[31]. Having multiple roles is another important complication in many workplaces. This issue requires a detailed description of the roles and selection of appropriate workers, so that they can show their best performance. Otherwise, the individual do not have a clear description of their roles.[32]. The role contradiction occurs due to the similarity of the roles of HCWs [33]. Kahen et al in their study have specifically addressed the issue of ambiguity of roles. They found that the workers with role ambiguity have higher stress, lower job satisfaction and lower levels of self-esteem. Ambiguity of roles causes lack of clarity about the expectations of a person's role. In this situation, self-confidence is eliminated to perform tasks. Eventually leads to a loss of performance and productivity in workers. [34].

Based on the results, responsibility was reported as the third most influential factor in predicting the HCWs job performance. Also, in a study by Shin et al. (2016) on 250 workers in South Korea, a positive and strong relationship was found between the role of responsibility and the occupational performance of workers[35]. The HCWs should be responsible for patients due to a significant role that they play in the health system. Thus, one can say that responsibility is an important principle in the provision of nursing care[36, 37]. The responsibility of HCWs is important due to their influential duties. Worker’s lack of accountability in the workplace is a big problem for organization, which causes mental stress and reduced job performance. The responsibility of HCWs provides comprehensive health-care services for patients. In addition, it can have a positive effect on the attitude of patients towards providing necessary care in the hospital. The health-care managers should increase the responsibility of HCWs, and take into account patients’ expectations and respond to it by best way[38, 39].

Based on the hypotheses of this study, role overload was also introduced as another predictive variable of the job performance. According to the model, the power of the relationship between the role overload and the performance was calculated as 0.80, which is a significant amount. The test statistic was also obtained as 5.62, indicating the significance of the correlation observed. Therefore, with a 95% confidence, there is a relationship between the role overload and job performance, which is consistent with the results of numerous internal and external studies conducted in this regard [40-42]. In explaining this hypothesis, we can say that HCWs faced different situations to do the job. Moreover, factors such as doing tasks with high speed, high workload and lack of support from colleagues and supervisor can cause occupational stress among HCWs. Consequently, the performance and services provided is affected by the this workers.[43, 44]. Hence, the attention of managers to different dimensions of workload in hospital and trying to provide working
environments with minimal stress are suggestions to be made to improve the HCWs job capability.

In this study, the role insufficiency had the lowest power in predicting the HCWs performance. The role insufficiency and role disproportionate with the individual skills in the HCWs are considered as a factor in occupational stress, which can adversely affect the individuals’ performance and bring in a lot of direct and indirect costs to the organization. The disparity between worker skills and job title cause unhappiness and stress as well. [30, 42]. In contrary, workers with high skills can expand their job skills and achieve progress and job satisfaction [34]. According to the findings of Siberta et al., a substantial increase had been predicted in job satisfaction and real career progress in the next two years due to high levels of personal initiative and creativity of individuals[45].

Limitations: One of the limitations of this study was the use of self-report questionnaires (the psycho-emotional conditions of individuals are one of the determining conditions on how to answer the questions). In addition, the data from this research have been tested with SEM for mere evaluation of relations of occupational stress with job performance. It is suggested to evaluate other variables affecting the HCWs’ job performance such as individual, organizational, and other psychosocial variables (such as job satisfaction, burn out etc.), in the future studies.

CONCLUSION
A significant relationship was established between the stressful variables and the HCWs job performance. In the meantime, the physical environment variable showed the most predictive power for the HCWs’ job performance. Accordingly, one of the important interventions can be focused on the improvement of the physical conditions of the workplace and maintaining this condition at standard levels. Ultimately, the success and development of any organization depends on the high occupational performance of the workers. If the organization does not consider the factors which affect the job performance, of the organization productivity would be affected its goals would not be achieve.

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