Model of burnout, depression, and work performance among nurses in China: a questionnaire survey.

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Abstract

Background: To investigate the relationship of job burnout, depression, with job performance among nurses and to construct a job performance model.

Methods: Questionnaires were administered to 792 nurses working in 5 hospitals in Zhengzhou, Henan province, China from July to August in 2015.

Results: Of the 792 nurses, statistically significant differences were found in the age, educational status, years working, department, job title, and personality types with respect to burnout, depression, and job performance (P <0.05). The job burnout scores were positively correlated with the depression scores and negatively correlated with the job performance (P <0.001). Nurses in the 25-29 years age group had the highest burnout scores (P <0.01). The burnout scores were higher among those who worked 6-15 years than those who worked more than 15 years (P <0.01). The job performance scores were higher in the ≥16-year than <6-year working group (P <0.05). The burnout scores were lower among intermediate-level than junior-level nurses (P <0.05), but the job performance scores were higher than those of junior-level nurses (P <0.01). Path analysis results showed that among the examined job characteristics, the direct effects of age, years working, and job title were greatest.

Conclusion: This study suggests that the main risk factors among job characteristics were age, years working, and job title. Burnout may lead to depression and a decline in job performance.

Background

With improvements in the quality of medical care, increasingly more attention has been paid to physical and mental health. As a basic component of medical and health services, nursing work occupies a pivotal position in the improvement of medical care. Nursing is a special occupation in which the workload is cumbersome and the working time is not fixed, the effects of which frequently lead to job burnout and depression.

Burnout refers to a state of exhaustion due to long working hours, a large workload, and high work intensity [1]; it is also characterized by psychological fatigue. Depression comprises a group of emotional mental disorders or illnesses with the main feature of significant mental disorders, often accompanied by corresponding thinking and behavior changes. In 2006, nursing ranked first with the highest rate of job burnout [2]. With the emergence of a patient-centered approach to health care, caregivers are often working under greater stress, more likely to experience burnout, and at an increased risk of depressive symptoms. A study [3] showed that the incidence of depression in nurses was 24.5%. Previous studies have shown that nurses with at least 10 years of working experience constitute the main force of hospital clinical care and exhibit high rates of resignation. Nursing is an occupation associated with stress, heavy responsibility, higher risks associated with special occupational groups, and long-term exposure to patients with disease, trauma, and even death. Such long-term stress in nurses can lead to burnout, anxiety, depression, and other psychological problems [4].

In the current medical environment, the medical staff is at the forefront of medical and health services. Medical staff members come into contact with a variety of diseases and death every day. The high degree of long-term concentration required for health care workers often makes physical and mental relaxation difficult. The working conditions, mood, and attitude of health care workers affect their work ability and performance. Job performance is a multidimensional, continuous, measurable factor associated with the goals of the institution. It is a relatively broad concept that includes the behavior of the individual and the results of such behavior. Many factors affect employee performance. Some researchers believe that job performance is a function that is closely related to personal factors such as anxiety [5, 6]. Burnout it is not limited to emotional exhaustion and workload and high work intensity are not the only factors that contribute to burnout development. In addition, most previous studies on this topic were limited to the use of multivariate logistic regression and multiple linear regression to obtain a "multi-reason single result" pattern. Multivariate regression analysis of multiple-result studies cannot reveal the indirect effects between the dependent and independent variables and negate the existence of measurement errors. A structural equation model (SEM) can start from the overall thought process of the topic of interest, consider the measurement error, simultaneously handle multiple dependents, and better explore potential variables and the relationship with the observed variables [7].

Therefore, this study aims to explore the relationship of job performance with burnout and depression among Chinese nurses. The relationships were analyzed by SEM, and the influence of these factors on job performance was evaluated.

Methods

Participants

We included nurses from five municipal hospitals in Zhengzhou, Henan province, China. The trained interviewers were from the Medical Affairs Department of the participating hospitals. Of the 900 distributed questionnaires, 792 (88.0%) were recollected and considered valid. Among the 792 participating nurses, 40 were male and 752 were female. The mean age of the participants was 28.8 years (standard deviation, 5.4 years), and the mean duration of working experience was 7.5 years (standard deviation, 5.9 years). The inclusion criteria for taking the questionnaire survey were: aged ≥18 years, more than one year working experience at current position, and no physical or mental illness.

Maslach Burnout Inventory–General Survey

Burnout syndrome was assessed using the Maslach Burnout Inventory–General Survey (MBI-GS) [8], which was previously translated into Chinese with good reliability and validity in a Chinese sample [9, 10]. The MBI-GS consists of 3 dimensions with a total of 15 items rated on a Likert scale from 0 to 6 points: exhaustion (EX, 5 items), cynicism (CY, 4 items), and professional efficacy (PE, 6 items). The score for each dimension is the sum of the items within that dimension. The level of burnout is positively related to the score. Because PE is scored in an opposite direction, the PE level is negatively associated with the PE

score. Cronbach's alpha of the 3 dimensions of the scale in this study was 0.878,0.832,0.847. Cronbach's alpha of the scale in this study was 0.832.

Measurement of depression

Depression was assessed using the Center for Epidemiological Studies Depression Scale (CES-D) to determine the frequency of depressive symptoms during the past week [11]. The CES-D consists of 20 items rated on a Likert scale from 0 to 3 points. The score is divided by the sum of all items, while items 4, 8, 12, and 16 are scored in the opposite direction. Higher scores on the CES-D indicate higher levels of depression. The total score ranges from 0 to 60 points; ≤16 points indicates the absence of depressive symptoms, 17 to 20 points indicates symptoms suspicious for depression, 21 to 24 points indicates clear depressive symptoms, and ≥25 points indicates severe depressive symptoms. Cronbach's alpha of the scale in this study was 0.95.

Measurement of job performance

The job performance scale used in this study was a modified version of the Motowidlo scale by Taiwan scholar Yu Decheng, which has been shown to have good reliability and validity [12]. It is divided into task performance and peripheral performance. Job performance consists of 11 items rated on a Likert scale from 1 to 5 points, where higher scores indicate higher levels of job performance. Task performance is assessed by items 1 to 6, which measure work efficiency, quality of work, and other factors related to the work itself. Peripheral performance is assessed by items 7 to 11, which measure whether staff members make extra efforts to help colleagues initiating problem solving, how they deal with interpersonal relationships, and other aspects of peripheral performance. Cronbach's alpha of the 2 dimensions was 0.857,0.811. Cronbach's alpha of the scale in this study was 0.902.

Measurement of personality type

Personality was assessed using two scales of the simplified Chinese version of Eysenck's Personality Questionnaire-Revised (EPQ-RSC) [13]. It includes 24 items, each scoring either 0 or 1. The neuroticism scale (EPQ-N) assesses emotional stability while the extroversion scale (EPQ-E) assesses the need for emotional stimulation. Each scale is divided into high and low categories based on the medians as the cut-off points reported in literature; this is an accepted method for analyzing psychometric scales [14]. A high score is defined as an EPQ-E C60 and an EPQ-N C61. Four personality types were classified: introvert stable (low EPQ-E, low EPQ-N), extrovert stable (low EPQ-E, high EPQ-N), extrovert unstable (high EPQ-E, high EPQ-N), and introvert unstable (high EPQ-E, low EPQ-N). Cronbach's alpha of the 2 dimensions was 0.710, 0.814. Cronbach's alpha of the scale in this study was 0.684.

Data analysis

Data were input using EpiData 3.1, and statistical analyses were performed with SPSS (version 18 for Windows; Chicago, IL, USA) and Amos 18.0. A two-tailed test at $P<0.05$ was considered statistically significant. A partial correlation analysis was used to analyze the associations of burnout and depression

with job performance and personality type, controlling for sex. Numerical variables are presented as mean ± standard deviation. t-test was used to determine the differences between two groups, while analysis of variance was used to compare multiple groups. If the results of the analysis of variance were significant, post hoc Bonferroni tests were performed to verify the differences between the specific groups.

According to the SEM established by Zhonglin et al. [15], nurses' job burnout, depression, and job performance interact with one another and impact job performance. Age, length of service, title, education, department, personality type, and other individual characteristics along with the burnout, depression, and performance scores were into the equation to fit the test, and the unmarked path was deleted. An SEM generally evaluates the fitted model to determine the degree of fit between the theoretical model and the actual sample data model. The most commonly used evaluation indicator for the data-fitting effect of the evaluation model is χ^2. If there is no statistical significance, then the model is better fit. If χ^2/df is <3, the model can be considered better fit [16]. In addition, according to the χ^2 and the seven evaluation indexes for the combined assessment method proposed by Zhonglin et al. [17], we used χ^2/df, goodness of fit index (GFI), adjusted GFI (AGFI), normed fit index (NFI), comparative fit index (CFI), incremental fit index (IFI), and root mean square error of approximation (RMSEA) as the evaluation criteria for model fitting. Higher values for these indices indicate a more accurate model. The GFI, AGFI, NFI, CFI, and IFI range from 0 to 1. When χ^2/df<3 and the GFI, AGFI, NFI, CFI, and IFI are >0.9, the model is better fit. A smaller RMSEA value is better; a value of >0.1 indicates a poor degree of fit, 0.1 to 0.08 indicates a moderate degree of fit, 0.08 to 0.05 indicates an acceptable degree of fit, and <0.05 indicates the best degree of fit.

Results

The general characteristics of demographic variables with respect to burnout, depression, and job performance

As shown in table 1, the performance score was significantly lower among nurses with a college or lower education level than those with an undergraduate or higher education level (P<0.01). Nurses in the 25-29 years age group had the highest burnout scores (P<0.01). The nurses' job performance scores increased with age (P<0.05). Further comparison showed higher burnout in the 25-29 years age group than in the ≥35-year age group (P<0.01). Nurses aged ≥35 years had a higher performance score than those aged <29 years (P<0.01).

The differences in the scores for the years working, burnout, depression, and job performance were also statistically significant (P<0.05). Burnout score was higher in those with shorter working experience (6-15 years) than those with longer (≥16-years). However, the depression score was higher in those who had longer working experience (6-15 years) than in the <6-year working group (P<0.05). The job performance score was higher in the ≥16-year working group than in the <6-year working group (P<0.05). The differences in the nurses' burnout and depression scores among different departments were also

statistically significant ($P<0.05$). Further comparison showed that the burnout scores were higher among nurses in the medicine department than among those in the obstetrics and gynecology department and other departments ($P<0.001$). Additionally, the depression score among nurses in the medicine department was higher than that among surgical nurses ($P<0.05$). The burnout score among nurses with an intermediate job title was significantly lower than that among nurses with a junior title ($P<0.05$), while the job performance score was significantly higher ($P<0.01$).

Burnout, depression, and job performance

A partial correlation analysis of job burnout, depression, job performance, and personality type after controlling for age (Table 2) showed that job burnout scores were positively correlated with depression scores ($P<0.001$) and negatively correlated with job performance scores ($P<0.001$). A negative correlation of extraversion with burnout and depression scores ($P<0.001$) and a positive correlation with job performance scores ($P<0.001$) were observed. In addition, the positive correlation of neuroticism with burnout and depression scores ($P<0.001$) and a negative correlation with job performance scores were found.

Personality, burnout, depression, and job performance

The comparison of different personality types with respect to job burnout, depression, and job performance are shown in Table 3. Statistically significant differences were found in the four personality types with respect to burnout, depression, and job performance ($P<0.001$). Further multiple comparisons showed that the burnout scores were lower among the stable than unstable type of nurses ($P<0.001$), and there were significant differences in depression scores among the four personality types ($P<0.001$). The performance score was highest among the extroverted and stable nurses and lowest among the introverted and unstable nurses ($P<0.05$). These indicate that introverted and unstable nurses have the highest depression and lowest performance, while extroverted and stable nurses have the lowest depression and burnout and the highest performance.

Correlation of individual characteristics and personality type with job burnout, depression, and job performance scores

According to the study hypothesis, nurses' job burnout, depression, and job performance interact with one another, and the first two impact job performance; this was used to establish an SEM. The final model of the fitting indexes is shown in Table 4, χ^2/df<3, GFI, AGFI, NFI, CFI, and IFI were all >0.9, and RMSEA=0.000, suggesting the model is well fit and the retained pathways are significant at $P<0.05$. The finalized model of the normalized parameter estimation path is shown in Figure 1.

The finally result of the nurse performance model was obtained by combining the path coefficients and the total effect of the observed variables and each latent variable in the modified model (Table 5). The absolute value of the effect coefficient represents the magnitude of the effect. The direct effects of age, length of service, and title were significant, indicating that these three observed variables had a

significant effect on the latent variables. Therefore, the improvement of occupational characteristics of the potential variable should focus on age, length of service, and title. The overall indirect effect of burnout on job performance and personality type on depression is greater than the direct effect. This indicates that there is a mediator factor between burnout and job performance and between personality type and depression that can affect job performance and depression.

Discussion

The purpose of the study was to find the relationship of job burnout, depression, with job performance among nurses and to construct a job performance model. In the present study, burnout was highest in the 25-29 years age group; nurses aged ≥35 years had a higher performance score than those aged <29 years (P<0.05). This were consistent with that of most of the researchers including Ang et al. surveyed nurses in a tertiary care hospital in Singapore and noted that staff nurses <30 years of age with high to very high neuroticism were more likely to experience emotional exhaustion, high depersonalization, and low personal accomplishment [18]. The reasons may be that nurses in the 31-35 age group have a relatively long working history, have accumulated a certain level of work experience, and have mastered the clinical care technology, resulting in high work enthusiasm and strong motivation [19]. Young nurses may have lower self-esteem and job-related confidence; additionally, because they have less clinical experience, their professional skills and psychological quality are lower than those of older nurses [20].

This survey showed that the burnout and depression scores were high among nurses with 6 to 15 years of working service. This may have been because these nurses are often bear heavier care and management responsibilities. Many also participate in both work and family tasks, which serves as an additional stress source [21]. A previous survey showed that the working pressure is high among nurses who have worked for this length of time. These nurses are often working under a high degree of tension, and the psychological load is heavy [22].

Title promotion is very strongly competitive in the hospital setting. The ability to cope with work, the sense of job achievement, income, and promotion opportunities are higher among high-title than primary-title nurses [23]. Primary nurses are in a dominant position at work and often perform repetitive and tiring tasks; they may therefore have a higher degree of burnout [24]. In this study, the burnout score among nurses with an intermediate job title was significantly lower than that among nurses with a junior title, while the job performance score was significantly higher (P<0.05).

In assessing the level of nurse burnout, depression, and job performance, attention should be paid to the differences between the different department. Molavynejad et al. found a significant number of the oncology nurses experienced the most severe stage of burnout [25]. This study showed that burnout and depression were more prominent among nurses in the medicine department than other departments. The reason for this finding may be related to the working environment and nature of illness of hospitalized patient. Compared with patients in other departments, most of those hospitalized in the medical department have chronic diseases and are elderly. The hospital cycle is long, the bed turnover rate is slow,

and the treatment effect is poorer than that in other departments; thus, the patient satisfaction rate is low, decreasing the nurses' occupational sense of happiness and pride [26]. Especially in the oncology department, rapid changes occur in patients, this may be the patients have a strong sense of mortality [27]; this place a psychological burden on nurses, resulting in frustration, guilt, depression, and other feelings that affect personal performance [28]. The work intensity is greater, the frequency of night work is higher, and the overall demand is greater; all of these factors require nurses to perform more detailed care, leading to higher burnout and depression.

Personality accounted for a significant portion of variance in burnout scores. In this study, the results found that the effects of different personality types on burnout were significantly different. The results showed that neuroticism was positively correlated with burnout and negatively correlated with job performance. In contrast, extraversion was negatively correlated with burnout and depression and positively correlated with job performance ($P<0.001$). which was consistent with the results of Divinakumar et al. [29]. People with certain personality types tend to be at higher risk of burnout. Studies have shown that the effect of personality type cannot be neglected when managing burnout [30]. Extroverted and stable nurses were optimistic, carefree, enjoyed social activities, were vibrant and enjoyed conversation, were skilled at controlling their emotions, used various social support factors to reduce occupational stress and inner stress, and exhibited lower rates of burnout [30, 31]. Emotionally stable nurses generally exhibit only small emotional fluctuations during works, can readily calm themselves, are able to maintain sympathy for the patient, and maintain enthusiasm for their work. Nurses with emotional instability have higher levels of sensitivity, impulsiveness, and depression [32]. These may be could explain the correlation of personality types with burnout, depression, and job performance found by us.

According to the basic theory of burnout, the tense nurse–patient relationship has developed prominently because of the changes in the modern nursing model and various problems in health care reform, and a considerable number of nurses have symptoms of burnout. Burnout/emotional exhaustion characterize by energy recession, chronic fatigue, and other factors, which are considered typical symptoms of depression. Additionally, cynicism implies social retreat and acquired helplessness, which are considered important components of depression in theory [33]. This study showed that job burnout scores were positively correlated with the depression scores and negatively correlated with the job performance. Increased burnout leads to increased depression, which in turn leads to a decline in job performance.

Burnout plays an intermediate role in occupational stress with respect to the development of depressive symptoms [34]. Depression directly affects nurses' job performance and quality of care [35]. Many studies have confirmed a significant correlation between burnout and job performance. A previous study showed that burnout can reduce an individual's job performance [36]. Employee performance can be improved by reducing the negative factors associated with burnout and mitigating work-induced physical and mental fatigue [37]. The dimensions of burnout were negatively correlated with job performance in this study, which is consistent with previous findings that burnout can negatively predict and affect job

performance [38]. These findings indicate that lower rates of job burnout and depression are associated with higher performance levels.

Path analysis results showed that among the examined job characteristics, the direct effects of age, years working, and job title were greatest. The total effect of burnout on job performance and of personality type on depression was greater than the direct effect. Depression can increase when burnout increases, and job performance declines as a result. Career activities should therefore focus more on these characteristics so that appropriate precautions can be taken.

Conclusion

In summary, this study showed that the risk factors for burnout in nurses were age (25-29 years), length of service (6-15 years), department (medicine), and title (intermediate). The risk factors for depression were length of service (6-15 years) and department (medicine). The risk factors for job performance were age (<29 years), length of service (<6 years), education (college or lower), and title (primary).

The results of the path analysis showed that the main risk factors among job characteristics were age, length of service, and job title. The level of burnout differed among nurses with different personality types. Burnout may lead to depression and a decline in job performance.

Abbreviations

Center for Epidemiological Studies Depression Scale: CES-D; Comparative fit index: CFI; Cynicism: CY; Eysenck's Personality Questionnaire-Revised: EPQ-RSC; EPQ-E: Extroversion scale; EPQ-N: Neuroticism scale; Exhaustion: EX; Goodness of fit index: GFI; adjusted GFI: AGFI; Incremental fit index: IFI; Maslach Burnout Inventory–General Survey: MBI-GS; Normed fit index: NFI; Professional efficacy: PE; Root mean square error of approximation: RMSEA; Structural equation model: SEM.

Declarations

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Authors' contributions

LL analyzed data and wrote the manuscript; YYC performed experiments; LXP, QN contributed specimen collection; YW contributed constructs; LL designed experiments; all authors commented on the article before submission.

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Availability of data and materials

The dataset supporting the conclusions of this article can be shared with the first author by email.

Declarations

Ethical approval and consent to participate

Written informed consent was obtained from all the respondents. Ethical approval was obtained from The Committee on Human Experimentation of Health Bureau of Zhengzhou (Zhengzhou, Henan Province, China).

Consent for publication

Not applicable

Competing interests

No conflicts of interest are declared.

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Tables

Table 1 Associations of demographic variables with job-related burnout, depression, and job performance in nurses

Variable	Partici-pants no.	Burnout mean±SD (*p* value)	Depression mean±SD (*p* value)	Job performance mean±SD (*p* value)
Sex				
Male	40	37.60±12.67	15.58±9.29	3.55±0.63
Female	752	36.07±13.58	17.33±10.91	3.66±0.62
Age				
<25	152	34.66±12.55	15.73±9.26	3.60±0.63
25–29	346	38.05±13.49	17.82±11.77	3.61±0.62
30–34	196	35.98±14.17	17.47±10.05	3.68±0.62
≥35	98	32.08±12.77（0.001）	17.06±11.15	3.83±0.59（0.013）
Educational status				
College or below	339	36.51±13.63	17.35±11.05	3.57±0.60
Undergraduate or above	453	35.88±13.46	17.15±10.69	3.71±0.64（0.002）
Marital status				
Single	301	36.33±13.31	16.92±10.46	3.61±0.62
Married	488	36.04±13.71	17.46±11.09	3.68±0.63
Years working				
<6	368	35.73±13.21	16.19±10.40	3.60±0.61
6-15	349	37.47±13.82	18.32±11.02	3.67±0.65
≥16	75	32.04±12.93(0.005)	17.36±11.68(0.032)	3.83±0.56(0.013)
Department				
Emergency	74	37.22±13.48	17.45±11.57	3.67±0.63
Surgical	181	36.40±12.75	15.62±9.70	3.67±0.63
Pediatric	38	35.58±13.12	15.68±12.07	3.45±0.63
Obstetrics and gynecology	101	32.30±13.91	16.71±9.72	3.64±0.60
Medicine	219	39.74±13.49	19.33±11.84	3.61±0.68
Auxiliary department	33	33.27±13.55	15.88±10.98	3.73±0.51
Other	146	33.38±13.17（0.000）	17.08±10.29（0.036）	3.73±0.57
Job title				
Primary	646	36.62±13.37	17.38±10.90	3.62±0.64
Intermediate	146	34.05±14.06（0.038）	16.60±10.58	3.79±0.55（0.002）

Table 2 Pearson correlations of the variables (n=792)

	Variable	*M*	*SD*	1	2	3	4	5
1	burnout	36.15	13.53	1.00				
2	depression	17.24	10.84	0.44*	1.00			
3	Job performance	3.65	0.62	（0.32*	（0.29*	1.00		
4	Extroversion	7.45	2.67	（0.16*	（0.29*	0.21*	1.00	
5	Neuroticism	5.81	3.37	0.34*	0.58*	（0.23*	（0.17*	1.00

Table 3. Associations of job-related burnout, depression, and job performance with different personality types in nurses

personality types	n	burnout	depression	job performance
Introvert Stable	169	33.35±12.83	13.79±9.41	3.68±0.61
Extrovert Stable	217	30.58±12.37	10.65±7.77	3.85±0.58
Introvert Unstable	218	40.68±13.16	24.13±10.50	3.49±0.56
Extrovert Unstable	188	39.85±12.96	19.95±9.78	3.59±0.70

Data are presented as mean ± standard deviation.

Table 4 Model of the fitting indexes

χ^2/df	GFI	AGFI	NFI	CFI	IFI	RMSEA
0.987	0.995	0.987	0.989	1.000	1.000	0.000

Table 5 Estimation result of SEM of medical staff members' job performance

P		Total Effect		Direct Effect	Total Effect	P
1.000	Job title←Job Cha	0.57	Job Cha→Burnout	-0.03	-0.03	0.431
0.748	Department←Job Cha	-0.01	Job Cha→Depression	0.10	0.09	0.003
<0.001	Years working←Job Cha	0.88	Job Cha→Job performance	0.12	0.11	0.001
<0.001	Age←Job Cha	0.91	Personality type→Burnout	0.25	0.25	<0.001
<0.001	Educational status←Job Cha	0.20	Personality type→Depression	0.26	0.35	<0.001
			Burnout→Depression	0.38	0.38	<0.001
			Burnout→Job performance	-0.24	-0.31	<0.001
			Depression→Job performance	-0.19	-0.19	<0.001

Abbreviation: Job Cha, job characteristics.

Figures
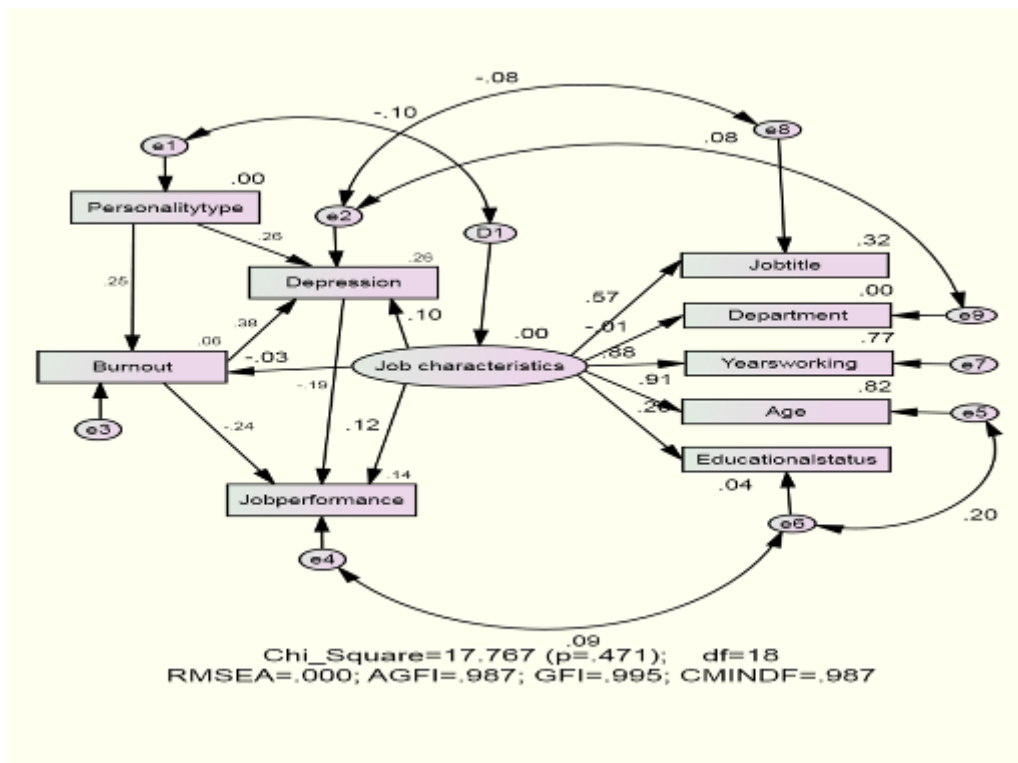
Figure 1

Nurses' job performance shown by a model of standardized parameters