






## ORIGINAL ARTICLE

# Job stress and its relationship with nurses' autonomy and nurse–physician collaboration in intensive care unit

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## Abstract

**Aims:** To determine nurses' job stress and its relationship with professional autonomy and nurse–physician collaboration in intensive care unit (ICU).

**Background:** Low professional autonomy, high job stress and lack of nurse–physician collaboration can affect nursing care in ICU and the main reasons ICU nurses leave the occupation or transfer to other clinical units.

**Methods:** A cross-sectional, correlational study was conducted on 398 nurses in teaching hospitals in Urmia, Iran, in 2020. Data were collected using the Dempster Practice Behaviors Scale, the Health and Safety Executive tool and the Jefferson Scale of Attitudes toward Physician–Nurse Collaboration.

**Results:** The mean job stress ( $115.53 \pm 12.42$ ) and professional autonomy ( $102.19 \pm 11.88$ ) of ICU nurses were 'moderate', and nurse–physician collaboration ( $74.25 \pm 5.10$ ) was 'good'. There was a positive relationship between professional autonomy and job stress ( $r = .506$ ) and nurse–physician collaboration ( $r = .242$ ). Professional autonomy was a predictor of job stress in nurses ( $p < .000$ ), and work experience in ICU can cause job stress in nurses ( $p = .024$ ).

**Conclusion:** Increasing nurses' professional autonomy causes an increase in job stress and improves nurse–physician collaboration in ICU.

**Implications for Nursing Management:** Nursing managers should implement practical strategies to improve nurses' autonomy, enhance nurse–physician collaboration and decrease their job stress.

## KEYWORDS

intensive care units, job stress, nurses, professional autonomy

## 1 | BACKGROUND

Nurses working in the intensive care unit (ICU) must take responsibility for their decisions in caring for critically ill patients (Keshk et al., 2018). The most basic tool for independent decision-making is having professional autonomy, which is more

necessary for ICU nurses than nurses working in other units (Rouhi-Balasi et al., 2020). Nurses' professional autonomy is the ability to have the right and responsibility to do their job based on their patient's needs and the freedom to implement those decisions (Georgiou et al., 2017). Professional autonomy leads to appropriate decisions to maintain patient safety, increase the

quality of care and have better patient outcomes (Rouhi-Balasi et al., 2020). Despite the importance of nurses' professional autonomy in their patient care (Labrague et al., 2019), nurses' clinical decision-making in patient care remains unclear (Nibbelink & Brewer, 2018). The opinions of nurses as marginal members of the care team are not taken into account in making decisions, leading to their job stress (Sarkoohijabalbarezi et al., 2017). Low professional autonomy, low capability and high job stress are the main reasons nurses leave the occupation or transfer to non-clinical units (Hara et al., 2020).

Job stress occurs when the expectations of a person exceed his authority and abilities (Quick & Henderson, 2016). Nursing is one of the most stressful professions (Chatzigianni et al., 2018). Nurses working in ICU bear the most stress due to special conditions caused by the work environment and patients (Johan et al., 2017), including problems with peers and supervisors, inadequate preparation, uncertainty concerning treatment, heavy workload, dealing with patients and their families and caring for critically ill patients and the dying (Mohamedkheir et al., 2016). This high stress causes many chronic physical illnesses and mental disorders. It reduces nurses' efficiency, leaving the occupation and changing jobs, and damage patient–nurse relationships (Salvagioni et al., 2017). Furthermore, it reduces creativity, decreases professional satisfaction, and leads to incorrect and timely decisions, poor nursing care, and patient dissatisfaction (Gheshlagh et al., 2017). One of the most effective ways to reduce stress is to promote teamwork (Johan et al., 2017). Caring is a team effort that provides effective care and achieves common goals through collaboration, communication and interaction (Mahdizadeh et al., 2015).

Due to nurses' and physicians' common field of work, their interprofessional collaboration is inevitable. In ICU, the complexity of caring for critically ill patients requires teamwork and interprofessional interaction (Georgiou et al., 2017). New evidence suggests that improving collaboration between physicians and nurses can improve patient outcomes (Matthys et al., 2017) by reducing medical errors (Farzi et al., 2017), increasing job motivation, reducing work pressure and maintaining patient safety (Patima, 2020). In contrast, poor collaboration can lead to job burnout (Georgiou et al., 2017), increased medical errors, and adverse outcomes in patients (Elsous et al., 2017; Patima, 2020).

Job stress and professional autonomy are of special importance in the nurses' performance in the ICU. A literature review showed that nurses' professional autonomy could be affected by environmental and cultural conditions (Amini et al., 2015). In Iran, nurses' professional autonomy has been reported to range from medium to high in various studies (Aghamohammadi et al., 2019; Amini et al., 2015). The relationship between professional autonomy, job stress and nurse–physician collaboration is contradictory in various studies. In the review of literature, no research was found that evaluated the relationship between these three concepts. Therefore, this study was conducted to determine nurses' job stress status and the relationship between professional autonomy and nurse–physician collaboration in the ICU.

## 2 | METHODS

A descriptive-analytical study was conducted using census sampling of all nurses who worked in ICUs in the teaching hospitals in Urmia, Iran, affiliated to the University of Medical Sciences in 2020. The total number of nurses was 500, which after excluding 102 participants who did not meet the inclusion criteria, and the total number of participants was 398. Inclusion criteria included full-time nurses working in the ICU, having an undergraduate or a higher education degree, having at least one year of work experience and willingness to participate in the study. Unwillingness to stay in the study or failure to complete the questionnaires by nurses was considered excluded.

### 2.1 | Outcome measures

Four questionnaires were used: demographic characteristics including gender, marital status, employment status, educational status, shift status and position in the ward, the Dempster Practice Behaviors Scale, the Jefferson Scale of Attitudes toward Physician–Nurse Collaboration, and the Health and Safety Executive indicator tool for work-related stress were used to collect data.

The Dempster Practice Behaviors Scale (30 items) was used to examine the professional autonomy of nurses. The questionnaire also contained four domains: 'readiness', 'empowerment,' 'actualization' and 'valuation' (Dempster, 1991). This questionnaire is rated using a 5-point Likert scale from 1 = not at all true to 5 = extremely true. The higher the score, the higher the level of autonomy. The instrument's reliability was determined by internal consistency and retest, and the correlation between them was reported to be 0.87 (Amini et al., 2015). In this study, Cronbach's alpha coefficient was also 0.83 indicating the adequate internal consistency of the questionnaire.

The Jefferson Scale of Attitudes toward Physician–Nurse Collaboration (15 items) was used to measure nurses' attitudes towards interprofessional collaboration. This questionnaire consisted of four domains including shared education and teamwork, caring as opposed to curing, nurse's autonomy and physicians' dominance. Each item is rated using a 4-point Likert scale from 1 = strongly disagree to 4 = strongly agree. The items related to physicians' dominance is rated the opposite with the highest score indicating strongly disagree. A higher score indicates nurses' positive attitude towards interprofessional collaboration between physician and nurse (Hojat et al., 2001). The content validity index of 0.87 and the content validity ratio of 0.78 were confirmed (Aghamohammadi et al., 2019). In this study, Cronbach's alpha coefficient was 0.78 indicating the adequate internal consistency of the questionnaire.

Health and Safety Executive indicator tool for work-related stress (35 items) was used to examine nurses' job stress. This tool has six domains including demands, control, support, relationships, role and change (Edwards et al., 2008). Each item is rated on a 5-point Likert scale from 1 = never to 5 = always. Higher score indicates

high job stress in nurses. Cronbach's alpha coefficients for indices of demands, control, support, relationships, role and change were 0.77, 0.70, 0.77, 0.81, 0.70 and 0.72, respectively (Jafarizadeh et al., 2017). In this study, Cronbach's alpha coefficient for the whole scale of job stress was 0.89 indicating the adequate internal consistency of the questionnaire.

## 2.2 | Data collection procedure

The study was approved by the Research and Technology Committee and the Ethics Committee of the University of Medical Sciences. A letter of introduction was then sent from to the Vice-Chancellor of Health Affairs to obtain permission from the participating hospitals. In the hospitals, a meeting was held to coordinate the research with the head of the hospitals, nursing directors and the ICU head nurses to explain the objectives and the study design. The researcher visited the ICU during the morning shift with the head nurses and explained the study objectives to the staff nurses and ensured their information would be kept confidential. The nurses were also assured they have the right to withdraw from the project at any stage. After obtaining their informed consent, the questionnaires were distributed to all nurses in the ICU, including all the shifts. Due to nurses' busy schedules in ICU, they were asked to complete the questionnaire in their spare time.

## 2.3 | Data analysis

SPSS software version 20.0. (Armonk, NY: IBM Corp) was used to analyse the data. The normal distribution of data was confirmed using the Kolmogorov–Smirnov test. Descriptive statistics included absolute and percentage frequency and mean, and the standard deviation was used to describe the demographic characteristics of the participants and nurses' attitudes towards professional autonomy, interprofessional collaboration and job stress. To investigate the relationship between demographic variables and study variables (professional autonomy score, nurse–physician collaboration and job stress of ICU nurses), independent *t* test and analysis of variance (ANOVA) were used. The Pearson correlation coefficient test was also used to investigate the relationship between nurses' professional autonomy score, job stress and nurse–physician collaboration. Linear regression was also used to investigate whether nurses' professional autonomy and nurse–physician collaboration could predict job stress.

## 3 | RESULTS

The results showed that 96% were female nurses, 68% were married, 91% had a bachelor's degree, 85% of the staff were on a rotational work shift, and 34% of nurses were permanent employees.

The results showed that ICU nurses' mean job stress was  $115.55 \pm 12.42$ , indicating moderate job stress level. Nurses had the

**TABLE 1** Mean, standard deviation and percentage frequency of job stress (HSE), professional autonomy (DPBS), interpersonal collaboration (JSAPNC) scores and domains in the intensive care unit ( $n = 398$ )

Variable	Mean	SD
<b>HSE</b>		
Demands	22.65	4.11
Control	18.35	3.94
Support	16.83	3.33
Relationships	11.13	3.04
Role	19.68	3.14
Change	9.71	2.19
Total score	115.55	12.42
<b>DPBS</b>		
Readiness	35.53	5.69
Empowerment	22.95	2.93
Actualization	34.01	4.49
Valuation	10.31	2.01
Total score	102.91	11.88
<b>JSAPNC</b>		
Shared education and teamwork	11.93	2.75
Caring as opposed to curing	5.31	1.33
Nurse's autonomy	5.27	1.45
Physicians' dominance	4.91	1.27
Total score	47.53	5.10

Abbreviations: DPBS, Dempster Practice Behaviors Scale; HSE, Health and Safety Executive indicator tool for work-related stress; JSAPNC, Jefferson Scale of Attitudes toward Physician–Nurse Collaboration; SD, Standard deviation.

highest stress level in the demand domain ( $22.65 \pm 4.11$ ) and the lowest score in the change domain ( $9.71 \pm 2.19$ ) (Table 1).

Professional autonomy of ICU nurses was moderate ( $102.91 \pm 11.88$ ) with nurses obtaining the highest professional autonomy in terms of readiness ( $5.69 \pm 35.53$ ) and the lowest score in terms of valuation ( $10.31 \pm 2.01$ ) (Table 1).

The mean total nurse–physician collaboration score was  $74.25 \pm 5.10$  indicating good collaboration between physicians and nurses. The highest nurse–physician collaboration was in the shared education and teamwork domains ( $11.93 \pm 2.75$ ), and the lowest collaboration was in the physicians' dominance domain ( $4.91 \pm 1.27$ ) (Table 1).

The results showed a significant positive relationship between job stress and professional autonomy, but no significant relationship was observed between job stress and nurse–physician collaboration. The results also showed that the correlation between job stress and professional autonomy was  $r = .506$ . These findings revealed that professional autonomy had a positive and significant relationship with nurse–physician collaboration ( $r = .242$ ), significant positive relationship between nurse–physician collaboration and age ( $r = .109$ ), work experience ( $r = .123$ ) and work experience in the ICU ( $r = .102$ ).

In addition, there was a significant relationship between professional autonomy and work experience in the ICU ( $r = .124$ ). Nevertheless, job stress was not statistically related to demographic characteristics (Table 2).

The regression model showed professional autonomy and interprofessional physician–nurse collaboration predicted 15% of job stress variance. The findings also showed that professional autonomy significantly predicted job stress, while nurse–physician collaboration did not. According to the beta of the professional autonomy, increasing one standard deviation in the professional autonomy score, the job stress score will increase by 40% (Table 3). In the proposed regression model, after adjusting the effect of demographic variables, professional autonomy was a predictor of job stress in ICU nurses (Table 4).

Table 5 shows that the four domains of readiness, empowerment, actualization and valuation predicted 17% of job stress variance. The beta of the readiness and valuation, by increasing one standard deviation in the readiness and valuation score, the job stress score will increase by 23% and 18%, respectively (Table 5). However, the model showed that none of the nurse–physician collaboration domains predict job stress except nurses' autonomy (Table 6).

## 4 | DISCUSSION

This study examined ICU nurses' job stress status and the relationship between professional autonomy and nurse–physician collaboration. The moderate job stress in ICU nurses was in line with the results of the previous study (Gheshlagh et al., 2017). However, job stress related to the demand, workload, characteristics and work environment domains was inconsistent with the previous study (Nasiry et al., 2016). Nurses believe that officials' and co-workers' support is moderate as well as change domain and how the staff changed that organisation which were not consistent with the previous study (Nasiry et al., 2016). The results could maybe due to the diversity of clinical units in their study. In the control domain, nurses experience moderate stress in their work which could be due to their belief that having positive traits to increase communications with others can reduced workplace conflict. However, in the role domain, nurses did not have a correct understanding of the organisation they serve. This highlights the need for managers to explain to nurses what are expected of them when they join the organisation, assess their level of job stress when performing staff appraisal so as to mitigate any stressors as soon as possible.

**TABLE 2** Correlations between professional autonomy, job stress and interprofessional collaboration with age, work experience and work experience in the intensive care unit

Variable	Professional autonomy	Job stress	Interprofessional collaboration	Age	Work experience	Work experience in ICU
DPBS	1	$r = .506$ $*p = .000$	$r = .242$ $*p = .000$	$r = .069$ $p = .174$	$r = .054$ $p = .282$	$r = .124$ $*p = .014$
HSE		1	$r = .056$ $p = .267$	$r = -.020$ $p = .693$	$r = -.029$ $p = .558$	$r = .078$ $p = .119$
JSAPNC			1	$r = .109$ $*p = .030$	$r = .123$ $*p = .015$	$r = .102$ $*p = .043$

Abbreviations: DPBS, Dempster Practice Behaviors Scale; HSE, Health and Safety Executive indicator tool for work-related stress; JSAPNC, Jefferson Scale of Attitudes toward Physician-Nurse Collaboration.

Predictor variable	B	SE	Beta	t	p
Constant	74.794	5.913	–	12.649	.000
DPBS	0.365	0.042	0.400	8.693	.000
JSAPNC	0.091	0.111	0.038	0.817	.414
ADJ. $R^2 = 0.157$	$R^2 = 0.162$	$R = 0.402$			

Abbreviations: DPBS, Dempster Practice Behaviors Scale; JSAPNC, Jefferson Scale of Attitudes toward Physician-Nurse Collaboration.

**TABLE 3** Regression analysis to predict job stress through professional autonomy (DPBS) and interprofessional collaboration (JSAPNC)

**TABLE 4** Stepwise regression model of the correlation between the job stress (HSE) and professional autonomy (DPBS) after adjusting demographic variables

Occupational stress	R	$R^2$	ADJ. $R^2$	B	Standard error	Beta	t	p	f
Professional autonomy	0.425	0.181	0.160	0.375	0.043	0.411	8.66	.000	8.54

**TABLE 5** Regression analysis to predict job stress (HSE) through the domains of professional autonomy (DPBS)

Predictor variable	B	SE	Beta	t	p
Constant	77.265	4.476	-	17.262	.000
Readiness	0.458	0.105	0.238	4.348	.000
Empowerment	0.150	0.104	0.067	1.442	.150
Actualization	0.181	0.098	0.096	1.849	.065
Valuation	1.218	0.379	0.184	3.213	.001
ADJ.R <sup>2</sup> = 0.178	R <sup>2</sup> = 0.186	R = 0.432			

**TABLE 6** Regression analysis to predict job stress through the domains of interprofessional collaboration

Predictor variable	B	SE	Beta	t	p
Constant	96.549	49.381	-	1.955	.050
Shared education and teamwork	0.131	0.663	0.029	0.197	.844
Caring as opposed to curing	0.104	1.066	0.011	0.098	.686
Nurse's autonomy	0.471	1.165	0.052	0.404	.024
Physicians' dominance	-0.393	0.815	-0.073	-0.482	.630
ADJ.R <sup>2</sup> = 0.009	R <sup>2</sup> = 0.003	R = 0.059			

In relation to ICU nurses' professional autonomy, the results concurred with other studies (Aghamohammadi et al., 2019; Georgiou et al., 2017). The attitude of nurses towards professional autonomy was reported to be relatively favourable (Lapeña et al., 2017) or even higher (Shohani et al., 2018). A comparison of studies showed that nurses' professional autonomy scores were reported as high, where nurses have high authority (Labrague et al., 2019; Lapeña et al., 2017). The difference in the degree of professional autonomy of ICU nurses in Iran can be due to the obstacles and limitations of their professional autonomy, such as rules, type of traditional control, supervision of hospitals, the hierarchical relationship between physicians and nurses and the high workload of Iranian health care systems (Farsi et al., 2010).

In the professional autonomy, the readiness domain showed that the attitude of the nurses in terms of proficiency, competence, skills and mastery of their work were consistent with previous studies (Aghamohammadi et al., 2019; Keshk et al., 2018) compared to good readiness domain among Egyptian nurses (Ibrahim et al., 2019). In the empowerment domain, nurses had a positive view of salaries, benefits and the legitimacy of nurses' performance. In the actualization domain, nurses had a moderate vision concerning nurses' accepting responsibility, responding to the performance and decision-making, which is not in line with the previously conducted study in the United States by Maylone et al. (2011). The reason may be due to the high levels of responsibility, authority and decision-making of nurses in Finland (Kuokkanen et al., 2016) compared to the Iranian nurses. Iranian nurses had a moderate valuation domain about their feeling of success at work, satisfaction and self-confidence in comparison with the American nurses (Maylone et al., 2011). Again, the results of our study may be explained by how Iranian nurses are treated by the health care system in general.

Our study showed a positive attitude of ICU nurses towards nurse-physician collaboration, compared to the recent studies conducted in Iran and elsewhere where the average score of nurses' attitudes towards physician-nurse collaboration was very favourable (Aghamohammadi et al., 2019; Elsous et al., 2017; Mahboube et al., 2019). Conducting studies in different hospital wards may be one of the reasons for the difference between physicians' and nurses' attitudes towards nurse-physician collaboration. Previous studies showed that favourable attitude towards nurse-physician collaboration in ICU is higher than in other wards (Aghamohammadi et al., 2019; Ghonaim et al., 2019). This is important as nurses and doctors need to work collaboratively when caring for critically ill patients in ICU where changes in status can change unexpectedly.

Our study showed that nurses' highest scores in collaboration were related to 'shared education and teamwork', and the lowest scores were related to the field of 'physicians' dominance'. This may be related to nurses that oppose physicians' domination and reject their dominant role in teamwork, although the severity of this rejection of domination was only reported to be moderate. Similar to our findings, studies in Saudi Arabia, Malaysia and Iran also rated the field of physician dominance as moderate or low (Aghamohammadi et al., 2019; Ghonaim et al., 2019; Tang et al., 2017).

Our study showed a significant positive relationship between job stress and professional autonomy in nurses. No similar study was found in Iran, and the results of studies conducted abroad were in contrast to our study, indicating a negative relationship between job stress and professional autonomy (Labrague et al., 2019; Vui-Yee & Yen-Hwa, 2020). This can be due to the lack of nursing staff, organisational- and profession-related barriers and restrictions on professional autonomy, such as the rules, the type of traditional control, the hierarchical relationship between physicians and nurses, and

the high workload of Iranian health care systems (AllahBakhshian et al., 2017). There is a significant positive relationship between professional autonomy, nurse–physician collaboration with age and work experience in our study. A positive correlation was found between nurse–physician collaboration and years of ICU experience in a study by Georgiou et al. (2017) as well as in the study of emergency department nurses by Abdolmaleki et al., (2018). A recent study reported significant relationship between the nurses' age, work experience and their professional autonomy (Shohani et al., 2018). Our results, however, were not consistent with the study of Elsous et al. (2017) as they reported that duration of work experience had no correlation with nurses and physicians attitude towards interprofessional collaboration (Elsous et al., 2017).

In our study, professional autonomy in readiness and valuation domains in the professional autonomy scale predicted nurses' job stress which is consistent with the study of Khakpour et al. (2018) but did not concur with the study of Labrague et al. (2019) among nurses in Oman (Labrague et al., 2019). This may be due to cultural difference between countries in the Middle East. In our study, none of the domains of nurse–physician collaboration predicted job stress in ICU nurses indicating that job stress is more related to lack of nursing staff, the high workload, heavy work schedule, lack of adequate rest and taking care of critically ill patients in the ICU.

## 5 | LIMITATIONS

One limitation of the study was the nurses' poor cooperative attitudes, which was solved by the head nurse and supervisors' support and mentioning to the nurses that the questionnaires would be anonymous. Failure to respond to all questions was another limitation, which was dealt with by ensuring the nurses' confidentiality.

## 6 | CONCLUSION

ICU nurses had only moderate professional autonomy and job stress in spite of having very good nurse–physician collaboration. The study highlighted that there is a need to enhance nurses' professional autonomy and alleviate nurses' job stress especially in critical care settings where nurses' quick decision-making skills are critical. Having communication skills and stress management workshops for nurses should be initiated. Also, providing balanced and favourable working conditions for nurses can reduce their work stress and ultimately improve nursing care quality.

## 7 | THE IMPLICATION FOR NURSING MANAGEMENT

Nursing managers should design work policies and strategies to support ICU nurses, improve the quality of work environments and give more professional autonomy to nurses so as to have job satisfaction

and keep more nurses in the profession. To improve nurses' autonomy, involving them in clinical decisions making should be one of the priority goals of any organisation. Interventions may be needed to enhance the level of nurse–physician collaboration further. Nursing managers should critically examine the patient–nurse ratio, introduce innovative shift work schedules and time off for nurses to address workload issues and job stress.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ETHICAL APPROVAL

IR.UMSU.REC.1398.450- Urmia Ethics Committee.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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