

Work-family conflict, burnout, and related factors among nurses during the COVID-19 pandemic in the Northwest of Iran

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Abstract.

BACKGROUND: Nurses, as the largest working group in the hospital, experience many problems, conflicts, and stressors in the workplace and family especially after the widespread distribution of coronavirus 2019 (COVID-19).

OBJECTIVE: The perceived conflict and burnout among nurses, as well as the correlation between these two variables and the associated factors, were the main subjects of this study.

METHODS: This cross-sectional study involved 256 nurses from three COVID-19 referral hospitals in northwest Iran. Participants completed demographic, work-family conflict (WFC), and burnout questionnaires. The nonparametric tests including Mann-Whitney U, Kruskal-Wallis, and Spearman correlation coefficient were applied to statistical analysis.

RESULTS: The overall score of conflict was 55.3 (12.7). The time dimension received the highest score 11.4 (2.9). In terms of intensity 27.6 (8.7) and frequency 27.6(8.8), nurses had the most burnout in the lack of personal accomplishment dimension. All aspects of WFC, emotional exhaustion, and depersonalization characteristics of burnout had statistically significant positive correlations ($p < 0.01$). The ward, hospital and employment status variables were associated with WFC ($p < 0.05$). The association between taking the crisis management course and the severity of depersonalization, and the frequency of lack of personal accomplishment was confirmed ($p < 0.01$). Additionally, the frequency and severity of emotional exhaustion were associated with employment status and work experiences ($p < 0.05$).

CONCLUSION: The findings showed that nurses had WFC and burnout rates that were above average. Regarding the negative effects of these two phenomena on health, and also nurse's clinical practices, rearranging work conditions and providing better organizational support seem necessary.

Keywords: COVID-19, burnout, conflict, work environment, mental health

1. Introduction

Work environments have fundamental differences in the degree of stressful situations. One of the most

stressful work environments is medical settings such as hospitals. Hospital staff is always faced with stressful stimuli due to dealing with patients. Nurses, as the largest working group in the hospital, have the most direct contact with patients and therefore have a worse situation in terms of facing stressful situations [1]. Especially when nurses have to

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44 deal with coronavirus 2019 (COVID-19), they have
45 intense workloads, extended workdays, night shifts,
46 and exposure to infectious diseases [2]. COVID-19
47 first appeared in Wuhan, China, in December 2019
48 [3]. It can be spread by close contact and shares a lot of
49 similarities with Middle East Respiratory Syndrome
50 (MERS) and Severe Acute Respiratory Syndrome
51 (SARS) in terms of its signs and symptoms. Fol-
52 lowing MERS and SARS in recent years, COVID-19
53 has been the world's most significant public health
54 emergency [4].

55 The work and living environments are the main
56 places where people spend their time. Adapting one's
57 situation to these two environments can lead to
58 psychological well-being. In most cases, however,
59 work environments follow mechanical conditions,
60 and, despite the development of human resource man-
61 agement approaches, many challenges are nowadays
62 seen in the workplace, which in many cases are due to
63 non-compliance of job requirements with living con-
64 ditions, referred to as the conflict [5]. The term WFC
65 refers to a type of interrole conflict in which the role
66 pressures from the work and family domains are con-
67 tradictory in some ways. The under-participation in
68 the family (work) role makes it harder to participate
69 in the work (family) role, according to this definition
70 [6]. There are three main components to it: WFC-
71 based time (the time spent doing work/family and
72 reducing family/work time), WFC-based pressure
73 (the level of energy expended on work/family duties
74 and reducing energy expenditure on family/work
75 affairs), and WFC-based behavior (the interaction of
76 behaviors and norms of the work/family environment
77 with behaviors and norms of the family/work envi-
78 ronment). The ability of nurses to balance between
79 professional and personal life can increase their men-
80 tal fortitude and affect the quality of the services they
81 provide, enhancing patient safety and satisfaction [7,
82 8].

83 Burnout is another variable that can affect the
84 degree of adjustment between work and family.
85 Burnout occurs in response to work pressures and
86 refers to a situation in which a person's attitude and
87 behavior become pessimistic towards his/her work
88 and profession [9]. Burnout was defined by Maslach
89 and Jackson as a work-related stress syndrome that
90 contains (a) Emotional Exhaustion (EE), including
91 weakened emotional feeling in contact with others,
92 (b) Depersonalization (DP), including negative feel-
93 ings toward the service recipients, and (c) Lack of
94 Personal Accomplishment (LA), including a nega-
95 tive assessment about the job [10, 11]. Personal traits,

96 the nature of the job, inadequate nursing staff, work-
97 ing environment and change shifts, relationships, and
98 the conflict that occurs between the physician and
99 nurse were recognized as the main problems associ-
100 ated with burnout among nurses [12]. In the clinical
101 field, burnout means loss of feeling and interest in the
102 patient resulting from inadequate care [13, 14].

103 Studies have shown that the situation of WFC and
104 burnout is not at the desired level in Iranian hospi-
105 tals and among nursing staff. 52.6% of the samples
106 in a study of 210 nurses in a social security hospital
107 reported having high levels of WFC [15]. The rate
108 of WFC was greater than usual in all three dimen-
109 sions of time, pressure, and conduct, according to a
110 second study of 374 nurses in eight teaching hospi-
111 tals [16]. The burnout scores in the frontline workers
112 of COVID-19 infection were considerably more than
113 those in the non-frontline workers, according to a
114 study of 245 nurses conducted after the COVID-
115 19 pandemic [2]. The results a cross-sectional study
116 among 212 nurses of six teaching hospitals showed
117 high intensity and frequency of burnout [17].

118 WFC can have an effect on nurses' quality of life
119 and mental health, which in turn alters their capacity
120 to provide services psychologically [18]. Addition-
121 ally, burnout among nurses can have an effect on their
122 attitudes toward their jobs and the quality of patient
123 care [19]. Due to changes in workload, working con-
124 ditions, and the amount of exposure to stressors as
125 a member of the health workforce and as a citizen,
126 the situation of WFC and burnout among nurses, as
127 well as its adverse effects, may be more severe during
128 the COVID-19 pandemic [20]. The negative conse-
129 quences of WFC and burnout and the possibility of
130 worsening the situation during the COVID-19 pan-
131 demic confirm the necessity of conducting studies in
132 this regard. Therefore, this research was conducted to
133 identify the level of WFC and burnout among Iranian
134 nurses, to examine the correlation between them, and
135 to determine associated factors related to these two
136 variables.

137 2. Methods

138 2.1. Study design

139 This cross-sectional survey was carried out from
140 September 1st to end of Journey 2021. Three referral
141 hospitals were selected in the Ardabil area of Iran's
142 northwest for the study, which offered services to
143 patients with COVID-19 (Fig. 1). The majority of



Fig. 1. Study setting.

144 the services for COVID-19 patients in this province,
 145 which has a population of about 1300,000, are pro-
 146 vided by these centers, which have over 870 active
 147 beds.

148 2.2. Sampling and data collection

149 753 nurses who worked the morning, evening, and
 150 night shifts in 26 hospital wards made up the study's
 151 population. Based on Krejcie and Morgan's table,
 152 which establishes sample size in accordance with a
 153 particular degree of community size and reliability
 154 [21], a sample size of 256 nurses was selected. The
 155 convenient sampling technique was used to select par-
 156 ticipants from among the qualified nurses. According
 157 to a quota and based on the proportion of nurses
 158 employed by each hospital in relation to the general
 159 population, a certain number of samples were allotted
 160 to each hospital.

161 After providing sufficient explanation about the
 162 study, all participants provided their verbal informed
 163 consent. In total, 300 questionnaires were distributed
 164 during September to Journey 2021. Participants were
 165 asked to complete and return the questionnaires
 166 within 20 days.

167 2.3. Survey tools

168 A three-part questionnaire with a demographic
 169 characteristics form, the Carlson et al. WFC scale,
 170 and the Maslach Burnout Inventory (MBI) was used
 171 to collect the data. Age, sex, education level, mari-
 172 tal status, employment type, hospital and department
 173 name, work experience (in years), shift type, fam-
 174 ily size, having children, and passing a crisis-related
 175 course were all questions on the demographic ques-
 176 tionnaire.

177 The second part was WFC scale which was devel-
 178 oped by Carlson et al (2000) and includes 18 items of
 179 the time (questions NO. 1-6), the pressure (questions
 180 NO. 7-12), and the behavior dimensions (questions
 181 NO. 13-18). Responses were provided on a 5-point
 182 Likert scale ranging from 1="strongly disagree" to
 183 5="strongly agree." The score obtained is in the
 184 range of 18 to 90, and a higher score indicates
 185 more WFC. Carlson et al. confirmed the reliability
 186 of the WFC questionnaire by Cronbach's alpha coef-
 187 ficient of 0.78-0.87 for different dimensions [22].
 188 The validity and reliability of this questionnaire in
 189 all subscales have been reported between 0.77 and
 190 0.92 in a study by Watai et al. [23]. The Persian ver-
 191 sion of this questionnaire was used in the study by

Rajabi et al., who calculated the correlation coefficient of 0.86, 0.85, 0.84, and 0.88 for the entire scale and between the subscales, respectively ($p < 0.001$) [24]. The reliability of the WFC scale was confirmed by the Cronbach's alpha coefficient of 0.872 in the mentioned study.

The final section of the survey was the MBI [25], which measured three aspects of job burnout with 22 items in three dimensions: emotional exhaustion (9 items), depersonalization (5 items), and lack of personal accomplishment (8 items). Moalemi et al. [26] studied the reliability coefficients, construct validity, convergent validity, and discriminant validity of this tool among Iranian nurses. The current study's EE, DP, and PA Cronbach's alpha coefficients were 0.87, 0.88, and 0.89, respectively. This survey's questions are graded on a 7-point Likert scale. This survey can be used with two different scale types:

A: Frequency scale: Never (zero), Several times a year (1), Once a month (2), Several times a month (3), Once a week (4), Several times a week (5), and every day (6).

B: Intensity scale: Never (zero), Very little (1), Low (2), Medium (3), Medium to high (4), High (5), and very high (6).

Both scales were examined in this study. The subscore obtained in each of the three aspects is placed in the categories of mild, moderate, and severe based on the reference score (Table 1).

2.4. Data analysis

Version 26 of the Statistical Package for Social Science (SPSS) software was used to analyze the data (IBM Corp., Armonk, NY, USA). Descriptive statistics including frequency/percentages and mean \pm standard deviation (SD), were used to present the respondents' demographic information. The scores of questionnaires were calculated according to each subscale and then analyzed by the software using descriptive data analysis. The Shapiro-Wilk test was used to determine the normality. To examine the relationship between the research variables,

the Mann-Whitney U, Spearman, and Kruskal-Wallis tests were used. Statistical significance was defined as a value of $p < 0.05$.

3. Results

3.1. Participants

From 300 distributed questionnaires, about 270 responses were received during this study. The overall response rate was 90%. Then, 14 incomplete responses were excluded.

Table 2 provides a summary of the samples' characteristics. The majority of subjects were female (87.5%) and married (82%), and 78.5% were officially and semi-officially government employees. 52.3% of the participants were nurses who worked at Hospital No. 1. The vast majority of the samples (93.4%) had a bachelor's degree in nursing, and 78.1% worked rotating shifts. Participants who had children and those who had a family of three or four were, respectively, 68.7% and 71.8%. A crisis management training was completed by less than half (44.9%) of the nurses. The participants' average age was 34.2 (SD = 6.6) years. 77% of participants worked in wards that were not exposed to COVID-19, and the average work experience was 9.5 (SD = 5.7) years.

3.2. WFC scores

Table 3 are shown the WFC results for nurses. Conflict received a total score of 55.3 ± 12.7 . The time subscale received the highest score out of all the dimensions, including time, pressure and behavior.

3.3. Burnout scores

According to results, 85.4% and 75.2% of nurses experienced high amounts of burnout in LA in terms of the intensity and frequency, respectively. Besides, the nurses stated a moderate level of burnout in DP and EE based on the frequency and a mild level

Table 1
Classification of burnout scores

Dimensions	Frequency			Intensity		
	Mild	Moderate	Severe	Mild	Moderate	Severe
EE*	≤ 17	18-29	≥ 30	≤ 25	26-39	≥ 40
DP**	≤ 5	6-11	≥ 12	≤ 6	7-14	≥ 15
LA***	≥ 40	34-39	≤ 33	≥ 44	37-43	≤ 36

*EE: Emotional Exhaustion; **DP: Depersonalization; ***LA: Lack of Personal Accomplishment.

Table 2
General characteristics of participants (N = 256)

Variables	N (%)
Gender	
Female	224(87.5)
Male	32(12.5)
Marital status	
Single	46(18)
Married	210(82)
Employment status	
Official	115(45.8)
Semi-official	82(32.7)
Contractual	16(6.4)
Corporative	20(8)
Temporary (2 or 4 years)	18(7.2)
Education level	
Bachelor's	239(93.4)
Master's or PhD	17(6.7)
Hospital	
Hospital No. 1	134(52.3)
Hospital No. 2	34(13.3)
Hospital No. 3	88(34.4)
Ward [§]	
Exposure to COVID-19	59(23)
Non-exposure to COVID-19	197(77)
Shift	
Rotational	200(78.1)
Fixed	56(21.9)
Having children	
Yes	173(68.7)
No	79(31.3)
Family number	
1	2(0.8)
2	37(14.7)
3	97(38.5)
4	84(33.3)
5	24(9.5)
>5	8(3.2)
Age (years)	
20-30	76(30.2)
31-40	133(52.8)
41-50	40(15.9)
>50	3(1.2)
Work experience (years)	
1-10	150(60.2)
11-20	86(34.5)
21-30	13(5.2)
Crisis management course	
Yes	111(44.9)
No	136(55.1)

[§]In three referral hospitals of COVID-19, six wards directly provided care to patients with COVID-19.

based on the intensity. Nurses' burnout scores and categories are shown in Table 4.

3.4. Correlation between WFC and burnout components

Table 5 shows significant positive correlations within all dimensions of WFC ($p < 0.01$), except the

time and pressure ($r = 0.119$, $p = 0.059$). In terms of burnout, the data showed correlations between EE and DP ($p < 0.05$). However, there was a non-significant negative correlation between EE and LA in terms of intensity ($r = -0.066$, $p = 0.29$) and frequency ($r = -0.47$, $p = 0.45$). Correlations were also observed between all dimensions of WFC and EE, and DP, dimensions of burnout ($p < 0.05$). The results also showed a non-significant negative correlation between six dimensions of WFC, and LA ($p > 0.05$).

3.5. Relationships between WFC components and demographic variables

The Mann-Whitney U analysis shows that the WFC score of non-exposure with COVID-19 wards (Mean (SD)=54.21(12.14)) was significantly lower ($Z = -2.08$, $p = 0.03$) compared to exposure with COVID-19 (Mean (SD)=58.58(14.14)). No significant relationship was found in the other bivariate demographic characteristics.

A significant relationship between the hospital and WFC is shown in Table 6 ($X^2 = 9.63$, $p = 0.008$). Additionally, the relationship between work status and WFC was statistically different ($X^2 = 11.67$, $p = 0.02$). To ascertain the cause of the difference, the Mann-Whitney U test was used. The WFC score in hospital No. 3 was lower than those of hospital No 1 ($Z = -3.04$, $p < 0.002$) according to this test. According to employment status, the WFC score in semi-official nurses was higher than corporative ($Z = -2.29$, $p = 0.02$), temporary ($Z = -2.40$, $p = 0.01$) nurses. Furthermore, official nurses in were experienced higher conflict than temporary nurses ($Z = -2.22$, $p = 0.02$).

3.6. Relationships between burnout components and demographic variables

A statistically significant difference between the crisis management course and the intensity of DP ($Z = -2.86$, $p = 0.004$) and frequency of LA ($Z = -2.75$, $p = 0.006$) was discovered. Additionally, there was no significant relationship between burnout components the other bivariate demographic characteristics,

Table 7 indicates significant relationships between employment status and intensity of EE ($X^2 = 13.46$, $p = 0.009$), and employment status and frequency of EE ($X^2 = 12.95$, $p = 0.01$). Based on the Mann-Whitney U test, the intensity of EE of semi-official nurses was higher than those of official ($Z = -2.68$,

Table 3
Distribution of scores among work-family conflict dimensions

Dimension	Mean (SD*)	Median	Minimum	Maximum
WFC**	30.6(7.2)	31	8	45
Time	11.4(2.9)	12	2	15
Pressure	10.6(3)	10	3	15
Behavior	8.7(2.9)	8	2	15
FWC***	24.7(6.9)	23	5	45
Time	8.7(2.5)	8	2	15
Pressure	7.6(3.1)	7	2	15
Behavior	8.4(2.8)	8	2	15
Total conflict	55.3(12.7)	54	18	90

*SD: standard deviation; **WFC: work-family conflict; ***FWC: family-work conflict.

Table 4
Burnout dimension scores and categories

Dimension scale	Mean (SD*)	Median	Minimum	Maximum	Category (n/%)		
EE**	Intensity	19.7 (11)	19.5	0	54	Mild	173(68.1)
						Moderate	24(29.1)
						Severe	7(2.8)
Frequency	20.3(11.7)	20	0	54	Mild	109(42.9)	
					Moderate	83(32.7)	
					Severe	62(24.4)	
DP***	Intensity	6.7(5.8)	5	0	30	Mild	148(58.3)
						Moderate	79(31.1)
						Severe	27(10.6)
Frequency	6.6(5.9)	5	0	30	Mild	138(54.3)	
					Moderate	59(23.2)	
					Severe	57(22.4)	
LA****	Intensity	27.6(8.7)	27	0	48	Mild	5(2)
						Moderate	32(12.6)
						Severe	217(85.4)
Frequency	27.8(8.8)	28	0	48	Mild	24(9.4)	
					Moderate	39(15.4)	
					Severe	191(75.2)	

*SD: standard deviation; **EE: Emotional Exhaustion; ***DP: Depersonalization; ****LA: Lack of Personal Accomplishment.

$p = 0.007$), corporative ($Z = -2.13, p = 0.03$), and temporary nurses ($Z = -2.76, p = 0.006$). In addition, there was a significant relationship between work experiences and the intensity of EE ($X^2 = 7.87, p = 0.02$). The intensity of EE among nurses with 21-30 years of work experience was lower than those of groups with 1-10 ($Z = -2.75, p = 0.006$) and 11-20 years ($Z = -2.55, p = 0.01$).

4. Discussion

This study looked into nurses' perceptions of WFC and burnout while working in referral hospitals that treated COVID-19 patients. Nurses experienced conflict and burnout at higher than typical rates. Nurses are among those who have direct contact with patients who have been diagnosed with a range of danger-

ous and occasionally undiagnosed illnesses that pose some occupational and familial hazards [2]. Other studies that were similar to the current study [15, 16, 27] found that Iranian nurses had higher levels of WFC and burnout.

In this study, more than 80% of the participants were women who stated a high level of conflict apparently due to their multiple roles such as being a wife and being a mother. Cinamon found that women had more effect on their families than men; therefore, their time and energy concerning family activities were more than their jobs and work activities. Consequently, the overlap of work and family behaviors and norms was more visible among them [28]. No gender effect was found in the present study. In line with our results, Labrague et al. and Bryon found no significant relationships between gender and WFC [29, 30]. Contrarily, some studies reported more con-

Table 5
Spearman correlation within and between WFC and burnout dimensions

		Burnout						WFC			FWC		
		EE		DP		LA		Time	Pressure	Behavior	Time	Pressure	Behavior
		Intensity	Frequency	Intensity	Frequency	Intensity	Frequency						
Burnout	EE	r=1	r=1	r=0.615**	r=0.662**	r=-0.066	r=-0.47						
	DP			p=<0.001	p=<0.001	p=0.29	p=0.45						
	LA			r=1	r=1	r=-0.128*	r=-0.130*						
						p=0.04	p=0.03						
						r=1	r=1						
WFC	Time	r=0.372**	r=0.390**	r=0.191**	r=0.170**	r=-0.044	r=-0.042	r=1	r=0.669**	r=0.325**	r=0.293**	r=0.119	r=0.234**
	Pressure	P=<0.001	P=<0.001	p=0.002	p=0.006	p=0.48	p=0.50		p=<0.001	p=<0.001	p=<0.001	p=0.059	p=<0.001
	Behavior	r=0.407**	r=0.411**	r=0.152*	r=0.169**	r=-0.031	r=-0.045		r=1	r=0.476**	r=0.4**	r=0.322**	r=0.313**
		P=<0.001	P=<0.001	p=0.01	p=0.007	p=0.62	p=0.47			p=<0.001	p=<0.001	p=<0.001	p=<0.001
		r=0.285**	r=0.299**	r=0.206**	r=0.210**	r=-0.108	r=-0.109			r=1	r=0.393**	r=0.477**	r=0.695**
		p=<0.001	p=<0.001	p=0.001	p=0.001	p=0.08	p=0.08				p=<0.001	p=<0.001	p=<0.001
FWC	Time	r=0.184**	r=0.197**	r=0.131*	r=0.119	r=-0.043	r=-0.037				r=1	r=0.498**	r=0.267**
	Pressure	p=0.003	p=0.002	p=0.03	p=0.058	p=0.49	p=0.55					p=<0.001	p=<0.001
	Behavior	r=0.177**	r=0.163**	r=0.208**	r=0.219**	r=-0.077	r=-0.079					r=1	r=0.412**
		p=0.005	p=0.009	p=0.001	P=<0.001	p=0.21	p=0.22						p=<0.001
		r=0.178**	r=0.177**	r=0.143**	r=0.166**	r=-0.073	r=-0.077						r=1
		p=0.007	p=0.005	p=0.001	p=0.008	p=0.24	p=0.23						

*Correlation is significant at the 0.05 level (2-tailed); **correlation is significant at the 0.01 level (2-tailed).

Table 6
Kruskal Wallis analysis of factors associated with WFC

Variable		WFC [¶] (\bar{X})	SD [§]	X ²	p-value	Mann-Whitney U test
Employment status	Official	56.28	13.15	11.67	0.02	Z = -2.22*; p-value=0.02
	Semi-official	57.18	10.66			
	Contractual	51.31	21.38			
	Corporative	51.15	8.50			
	Temporary	50.50	11.56			
Hospital	Hospital No. 1	57.22	13.37	9.63	0.008	Z = -3.04**; p-value=0.002
	Hospital No. 2	55.91	11.06			
	Hospital No. 3	52.11	11.88			
Age (years)	20-30	55.30	13.96	2.68	0.44	
	31-40	56.33	11.89			
	41-50	52.98	12.33			
	Up 50	53.67	5.68			
Work experience (years)	1-10	55.75	12.96	0.40	0.81	-
	11-20	55.35	11.97			
	21-30	53.15	15.27			
Family number	1	54.50	3.53	3.50	0.62	-
	2	51.68	14.14			
	3	55.89	12.53			
	4	56.52	11.95			
	5	55.58	13.20			
	Up 5	52.63	9.21			

*Indicates a significant value ($p < 0.05$); **indicates a significant value ($p < 0.01$); [§]SD: standard deviation, [¶]WFC: work-family conflict

355 flict among female employees than men [31, 32], and
356 others among men [33]. These differences may be
357 due to differences in the cultural views and attitudes
358 of employees in different organizations regarding the
359 type and nature of work or the work environment.

360 In this study, the time subscale had the highest
361 score in both the WFC and FWC, and the WFC score
362 was higher than the FWC score. In the meantime, time
363 management is a key factor in WFCs, particularly in
364 the current study where the prevalence of COVID-19
365 may increase nurses' workload and conflict. Accord-
366 ing to certain studies, excessive work hours and a
367 work schedule that includes weekends are directly
368 associated with a higher frequency of WFCs and have
369 an impact on the amount of time needed to com-
370 plete job tasks, leaving less time for family-related
371 activities [29, 34].

372 In line with the present study, Khoshnoodian et
373 al. reported higher scores of WFC compared to FWC
374 [15]. In another study, Fang reported that the scores of
375 WFC were all higher than those of FWC. The highest
376 score related to time dimension similar to our study
377 [35]. Hesabi et al. presented evidence that pressure
378 and time were the most conflicts in the fields of FWC
379 and WFC, respectively, in accord with the present
380 study. Besides, the mean FWC score was higher than
381 that of WFC [16]. Buonocore and Marcello showed

382 that nurses experienced WFC in the pressure dimen-
383 sion due to working in unusual conditions, being
384 in contact with patients, and its resulting problems,
385 paternal and maternal roles [36].

386 The current study discovered various character-
387 istics, such as ward, hospital, and work status that
388 are related to WFC dimensions. In similar research,
389 Labrague et al. observed that WFC was predicted
390 by nurse age, education, facility size, and hospital
391 location [29]. According to Askari et al., WFC had
392 adverse relationships with hospital staff members'
393 ages and work experiences [37]. Shah and Rajad-
394 hyaksha's research [38] demonstrated that workers
395 in more populous, urbanized areas had significantly
396 higher levels of WFC than those in less urban-
397 ized areas. Department was a significant predictor of
398 WFC, according to the Fang study. Also, it was cor-
399 related with FWC [35]. According to two studies [39,
400 40], nursing education did not predictor of WFC. The
401 results of the previous three investigations agree with
402 the present study. The relationship between demo-
403 graphic factors and WFC among nurses and doctors
404 treating COVID-19 patients was not supported by the
405 research by Mosalanejad et al. [41].

406 Fujimoto et al. showed that childcare responsibil-
407 ities or having small children likely increased the
408 conflict of absence at work [42]. In the present study,

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having children was not a related variable. Afshani and Hatefird confirmed the importance of employment status and showed that the average WFC was higher in private jobs than in government jobs [43]

due to the stable condition of government workers. This is contrary to the results of the present study where WFC score in was significantly higher among officially, and semi-official nurses than corporative

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Table 7
Kruskal-Wallis analysis of factors associated with burnout dimensions

Subscales	Kruskal-Wallis test									Mann-Whitney U test
	Intensity				Frequency					
	\bar{X}	SD	X^2	<i>p</i> -value	\bar{X}	SD	X^2	<i>p</i> -value		
According to hospital										
EE	Hospital No. 1	21.1	11.1	4.48	0.1	7.5	6.1	5.18	0.07	
	Hospital No. 2	19.3	11.4			6.3	5.8			
	Hospital No. 3	17.8	10.6			5.6	5			
DP	Hospital No. 1	27.1	9.3	5.44	0.06	21.9	12.1	5.86	0.054	
	Hospital No. 2	30.4	8.6			19.8	12.4			
	Hospital No. 3	27.2	7.5			18.1	10.5			
LA	Hospital No. 1	7.5	6.3	3.8	0.14	27	9.3	3.2	0.2	
	Hospital No. 2	6.1	5.8			30.4	9.1			
	Hospital No. 3	5.5	5.1			28	7.6			
According to employment status										
EE	Official	19.4	10.8	13.46**	0.009	6.1	5.5	12.95*	0.01	Z = -2.68, <i>p</i> -value=0.07
	Semi-official	23	11.1			8.1	6.2			
	Contractual	16.3	12.6			5.9	6.2			
	Corporative	18	9.1			6.6	5.2			
	Temporary	14.1	7.1			5.7	4.2			
DP	Official	28.7	8.4	6.59	0.15	19.5	11.6	9.39	0.052	<i>p</i> -value=0.006
	Semi-official	27.3	8.5			24.1	12			
	Contractual	21.3	12.4			16.7	13.9			
	Corporative	26.4	7.4			18.6	8.3			
	Temporary	26.5	6.5			16.2	7.1			
LA	Official	6.1	5.6	7.32	0.12	28.6	8.7	6.6	0.15	
	Semi-official	8.3	6.5			28	8.4			
	Contractual	4.8	5.8			20.8	13.1			
	Corporative	6.7	5.5			27.4	5.9			
	Temporary	5.3	4.5			26.6	8.1			
According to age (years)										
EE	20-30	18.9	12.4	3.68	0.29	6.6	6.1	4.28	0.23	
	31-40	20.8	9.4			7.1	5.6			
	41-50	18.1	12.5			5.8	5.6			
	>50	16	12.1			2.3	2.5			
DP	20-30	26.7	9.3	4.77	0.18	20.1	13.1	4.19	0.24	
	31-40	27.5	8.5			21.5	10.6			
	41-50	28.3	7.8			17.6	12.1			
	>50	34.6	9.2			15.6	11.8			
LA	20-30	6.7	6.5	2.98	0.39	25.9	9.6	3.45	0.32	
	31-40	7.1	5.7			27.9	8.3			
	41-50	5.6	5.5			27.9	8.5			
	>50	2.3	2.1			36.3	6.4			
According to work experience (years)										
EE	1-10	19.9	11.5	0.18	0.91	21	12.1	1.06	0.58	
	11-20	19.6	10.6			19.6	11.6			
	21-30	18.3	8.4			17.7	9.1			
DP	1-10	7.1	5.9	7.87*	0.02	7.1	5.9	5.83	0.24	Z = -2.75, <i>p</i> -value=0.006
	11-20	6.7	5.7			6.7	5.7			
	21-30	2.9	3.3			2.9	3.3			
LA	1-10	26.6	8.9	2.84	0.24	26.9	8.9	2.32	0.31	<i>p</i> -value=0.01
	11-20	28.9	8.2			28.9	8.9			
	21-30	28.5	9.6			29.7	8.9			

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Table 7
(Continued)

Subscales	Kruskal-Wallis test								
	Intensity				Frequency				Mann-Whitney U test
	\bar{X}	SD	X ²	p-value	\bar{X}	SD	X ²	p-value	
According to family number									
EE	1	39	21.21	8.89	0.11	7	7.1	8.27	0.14
	2	19.5	12.4			7.5	6.9		
	3	20.26	10.1			6.7	5.4		
	4	19.1	10.2			6.4	5.8		
	5	16.3	12.8			5.7	4.7		
	>5	25	11.1			8.5	4.3		
DP	1	22.5	2.1	2.69	0.74	38.5	21.9	4.7	0.45
	2	26.9	10.1			20.2	13.7		
	3	26.2	7.5			21.2	10.7		
	4	29.1	9.3			19.1	10.9		
	5	27.8	9.1			17.1	12.5		
	>5	25.2	5.2			26.7	2.5		
LA	1	10.5	10.6	7.02	0.21	28	1.4	3.48	0.62
	2	7.1	7.1			26.8	10.1		
	3	6.6	5.5			26.9	7.5		
	4	6.4	6.2			28.9	9.4		
	5	5	4.2			28.1	10.3		
	>5	9.2	4.7			27.1	4.2		

*Indicates a significant value ($p < 0.05$); **indicates a significant value ($p < 0.01$); SD: standard deviation.

and temporary nurses.

In particular, frontline healthcare professionals had high amounts of burnout during the COVID-19 pandemic, according to several studies [2, 44–46]. Nevertheless, other investigations have also identified contradictions. A group working on the front lines of COVID-19 had a decreased prevalence of burnout, according to Wu et al. [47]. It seems that the spread of this virus has imposed a double burden on health care personnel, which has led to burnout. According to Taghilou et al., COVID-19 had a direct impact on burnout rates, which rose by 39% as its impact grew [48]. According to the current study's findings, nurses had a high rate of burnout in the LA dimension. Similar to this, Rivaz et al. reported high levels of burnout among nurses working in intensive care units (ICUs), with the LA dimension accounting for the majority of the felt burnout [17]. In the EE and DP subscales, respectively, Zhang et al. revealed a modest level of burnout among nurses during the COVID-19 pandemic. However, similar to the present study, a severe LA was experienced by around 70% of subjects [49]. In a different investigation, Torrente et al. discovered that Spanish healthcare workers on the frontlines of COVID-19 and non-COVID-19 had moderate burnout in the three dimensions of EE, DP, and LA [28].

According to Sayilan et al.'s research, female and single nurses experienced significantly greater

burnout in all three dimensions [50]. According to Torrente et al.'s findings in a different study, being a doctor, a woman, and working on COVID-19 frontline were all associated with a higher risk of developing burnout syndrome [46]. Gender, age, and frontline workers' burnout were not found to be related in this study. The results of this study may differ from earlier literature due to variations in working conditions. Hayes et al. confirmed that nurses with more work experience reported lower levels of burnout than those with less work experience [51]. In accordance with the findings of the current study, Biganeh et al. reported that the LA of nurses had a significant positive relationship with job experience [52]. Nurses with more job experience appear to be more financially stable and better equipped to handle difficult situations; on the other hand, they also enjoy greater respect and work fewer shifts than their less experienced counterparts, which helps them avoid burnout. Compared to the other nurses in this study, semi-official nurses had a higher level of EE intensity. Fang verified that the types of employment and emotional exhaustion were related [35]. Burnout and employment status have a significant relationship, according to research by Portero De la Cruz et al. and Ravari et al. [53, 54].

All aspects of WFC and burnout were found to significantly positively correlate, with the exception of LA, according to our research. Wang et al. discov-

ered that both components of WFC were positively related to emotional exhaustion and cynicism in two investigations that were similar to our own. These findings involved both male and female doctors as well as female nurses. However, family conflict that interferes with work was adversely correlated with professional efficacy among nurses and both male and female doctors, but work conflict that interferes with family was positively correlated with professional efficacy both female nurses and male nurses [55, 56]. WFC was one of the effective predictors of burnout, according to Cotel et al [45]. Fang reported correlations between all dimensions of WFC and burnout. As with this study, they observed a negative correlation with the dimension of lack of accomplishment [35]. This may be because a lot of conflict makes a person try harder and, as a result, increases the person's sense of success.

Building internal strength, capability, external support, and reinforcement are a few strategies recommended by experts to combat burnout [35]. In this study, a statistically significant difference was found between the DP, LA, and crisis management courses. However, no significant relationship was found regarding the conflict. According to Shafiabadi et al., mindfulness training significantly decreased WFC in nurses who were married [57]. Khosravan et al. discovered no significant differences between WFC scores before the intervention in the test and control groups after a family-focused educational-supportive program, but considerably lower scores were reported in the test group after the intervention [58]. According to Hasmi et al., organizational support mediates the relationship between job stress and WFC in terms of how well people perform at work [59]. When compared to other medical personnel, WFC was much lower among the medical staff taking the ethics course, according to Mosalanezhad et al. [40]. According to Cotel et al.'s findings, these needs and resources should be the primary focus of psychological therapies for healthcare professionals during the COVID-19 outbreak [45]. Maybe healthcare workers' mental health appears to be effectively promoted by training and assistance.

4.1. Strengths and limitations

The main positive point of this study is that it has addressed two very important and fundamental concepts (WFC and burnout) in the field of nursing, which can be related to the health of nurses and their performance especial during the coronavirus disease.

Another strength of this study is to consider the factors associated with WFC and burnout that can be used as a guide for decision-making in line with the design and implementation of related interventions. Despite the strengths, this study has a main limitation that the samples were recruited only from hospitals in a province in the northwest of Iran, so the results may not be generalizable to other hospitals in Iran. Also, in this study, we did not study some of the possible variables including the presence of illness among nurses or their family members, mother-father-child or single parent, payment details, and amenities such as nursery/kindergarten option for the workers.

5. Conclusion

Our findings revealed that the perception of WFC and burnout among nurses is not in a favorable state. This outcome may serve as a warning for managers, given the detrimental effects of WFC and burnout. The management of WFC and burnout by hospital managers and related authorities will be significantly impacted by knowing the status of these variables as well as the factors related to each one. Moreover, given the established link between them, the promotion of an adequate work-life balance may help prevent burnout. However, the lack of longitudinal and extensive data made it difficult to interpret our findings. Therefore, longitudinal research on the variables linked to WFC and burnout in large settings may provide helpful data for administrative and psychological interventions.

Ethical approval

Ethical permission was obtained from the Ethics Committee of Ardabil University of Medical Sciences (IR.ARUMS.REC.1399.318).

Informed consent

Informed consent was obtained from all participants before their participation in the study.

Conflict of interest

None to report.

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