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Factors Influencing Nurses' Intention to Leave Profession in Iran

Zohreh Hosseini Marznaki [1], Saeed Barzegari [2], Waliu Jawula Salisu [3], Maryam Azarnivand [4], Khatere Khanjankhani [5*]

[1] Department of Nursing, Amol Faculty of Nursing and Midwifery Sciences, Mazandaran University of Medical Sciences, Sari, Iran
[2] Department of Health Information Technology, Amol Faculty of Paramedical Sciences, Mazandaran University of Medical Sciences, Sari, Iran
[3] Cambridge Liver Unit, Cambridge University Hospitals NHS Foundation Trust, Addenbrooke's Hospital, Hills Road, CB2 0QQ, Cambridge, United Kingdom
[4] Faculty of Nursing and Midwifery Sciences, Shahroud University of Medical Sciences, Shahroud, Iran
[5] Faculty of Public Health, Tehran University of Medical Sciences, Tehran, Iran

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***Corresponding Author:**
Khatere Khanjankhani
Faculty of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Email:
kh.khanjankhani@gmail.com

Tel:
+98-913 859 1240

ABSTRACT

Background: Several reasons account for nurses' intention to leave the nursing profession. Understanding these factors is a step towards reducing such incidents which pose a threat to the nursing profession. This study aimed to identify and rank the circumstances that influence the intention to leave the nursing profession in Iran.

Methods: The present study is a cross-sectional analytical study, which employed four other methods to reach a sound conclusion in 2019.The electronic databases, including the Scientific Information Database, PubMed, Scopus, Science Direct, OVID, Cochrane Library, CINAHL,, were searched for studies published from the year 1998 to December 2018 for scientific studies conducted among factor associated intention to leave in Iran. The Exploratory Factor Analysis (EFA) method was then used to extract hidden factors and determine the hierarchical structure of the review's findings. Using the combination of Analytical Hierarchy Process and Fuzzy Logic, the weight of each one of the factors that affect the intention to leave the nursing profession was then calculated. Finally, the accuracy of the results of the Consistency Ratio and Fuzzy analytic hierarchical process (FAHP), was calculated and evaluated.

Results: The electronic search delivered 100 studies, from which we identified and extracted 26 most occurring reasons for the desire to leave the nursing profession. Based on the EFA results, we identified four criteria (personal, managerial, organizational, and side issues) with eigenvalues higher than 1. The first criteria (personal issues) scored the highest (53.39 %), while side issues scored the lowest (13.40 %) as reasons accounting for the intention to leave the nursing profession.

Conclusion: Job stress, the lack of freedom and independence in the clinical environment, discrimination, and the probability of catching an illness have higher prominence in influencing nurses' tendency to leave work. These factors can be mitigated by altering managerial techniques within organizations.

Key words: Fuzzy logic, Analytic hierarchy process, Intention, Nursing.

Citation

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Introduction

The shortage of nursing staff (SNS) and leaving the nursing profession (LNP) are significant concerns of most human resource managers (1) and have become a challenge confronting both developed and developing countries (2, 3). LNP can be considered the nurse's apparent and conscious intention to permanently and voluntarily leave his/her profession (4). As the year 2020 faces a pandemic, it has led to an overburdened health demand, exposing nurses and midwives' substantial health contributions worldwide. The situation has further widened shortages within the nursing workforce, calling for proactive and innovative measures to avert such critical shortages. Although the World Health Organization estimates an additional nine million nurses and midwives are needed by 2030, countries already battling shortages might face further shortages during these critical moments (5).

Recent literature suggests that the nursing profession faces severe shortages in Iran, with job-leaving statistics among nurses on a constant increase (6, 7) that comes when there is an urgent need for the nursing workforce due to the rise in disease burden (8, 9).

The intention to leave the nursing profession (ILNP) has adverse effects on nurses, patients, and health care organizations (10). As a result, the SNS negatively impacts patients' access to health care services and quality and exposes patients to unsafe care and unbearable health care costs (11). On the other hand, LNP reduces productivity in organizations and invites extra costs, such as hiring and training new employees (12). Numerous factors exist that influence the willingness of LNP (4, 13).

Based on the existing literature, both quantitative and qualitative factors affect ILNP and LNP. A multi-criteria decision analysis (MCDA) method can be used when several factors influence a decision. The aim is to specify the rank or the ratio of their impact on choosing that decision. One of the best existing approaches in this field is the analytic hierarchical process (AHP), which, combined with fuzzy logic, can adequately simulate individuals' decision-making (14, 15). Using fuzzy logic, decision making and judgment can be expressed in a way that is closer to human reasoning (16). Considering the importance of LNP, this research aimed to determine, verify the face, content, construct validity, and finally rank these factors using FAHP in Iran. This study's main question was: "What are the factors responsible for nurses' intention to leave their profession in Iran?"

Materials and Methods

This is a cross-sectional study conducted in four stages in 2019. First, a literature search was conducted in electronic databases to identify factors responsible for nurses' intention to leave. Then, the face and content validity of the items were approved by a panel of experts. In the third stage, the hidden factors were identified using exploratory factor analysis (EFA). Finally, using a hierarchy process, the items were categorized and ranked in order of importance.

Extracting items of ILNP

In the first stage, a comprehensive literature review was conducted in electronic databases such as PubMed, Scopus, Science Direct, OVID, Cochrane Library, CINAHL, and internal SID databases for studies published from the year 1998 to December 2018. The focus of the review was to identify studies in line with the aims of the current study. One hundred studies were reviewed, from which we identified and extracted 26 frequently occurring circumstances that were responsible for the ILNP.

Face and content validity of items

In the second stage, a panel of experts comprising 15 nurse managers with at least ten years of clinical work experience conducted the quantitative and qualitative face and content validity for each item. In the qualitative face validity, grammatical and semantic problems and ambiguities of the words and sentences were identified and corrected. For the quantitative evaluation of face validity, the impact score was computed based on the frequency

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(%) × importance. Scores higher than 1.5 were considered appropriate (17).

Both Content Validity Index (CVI) and Content Validity Ratio (CVR) indicators were used to evaluate the quantitative content validity. The experts presented one score for each criterion ranging from 1 to 4, where one meant "strongly disagree," and four meant "strongly agree "(18). A CVI higher than 0.79 was considered acceptable (19). The CVR was used to investigate the necessity of the existence of criteria. According to Lawshe's table, a CVR score higher than 0.62 is acceptable (20).

Exploratory factor analysis (EFA)

In the third stage, the hidden factors were identified, and the structural validity was evaluated using EFA. For valid factor analysis, at least 250 samples are required (21); therefore, we invited 250 nurses from teaching hospitals of the Mazandaran University of Medical Sciences in Iran, which fulfilled the 5-point Likert questionnaire (score 1: very low importance, to score 5: very high importance). The questionnaire consisted of demographic questions and reasons that affect LNP. Due to the significant correlation between items, the Promax rotation was used to extract the latent factors. Eigenvalue ≥ 1 was used to identify the factors. Finally, the panel of experts named the extracted factors.

Chang's triangular fuzzy analytic hierarchy process was conducted in 5 steps (22).

Selecting experts

We chose 15 nursing experts with at least five years of clinical experience or teaching in a nursing school. Given that the analytical hierarchy process (AHP) is not a statistical method and does not seek to prove any statistical hypothesis, there was no need for a large sample size. Also, there was no specific method for determining the sample size; it depended on the samples' availability (23).

Developing the hierarchical structure of the AHP

The hierarchical structure of the problem was developed based on the results of the EFA. The experts then grouped the factors under broader definitive headings classified as criteria since the factors were named earlier. Items under each criterion were labeled as sub-criteria.

Designing the pairwise comparison matrices and training experts to fulfill them

The pairwise comparison matrices were designed based on the hierarchical structure of the AHP and fulfilled by experts. As fuzzy logic is closer to human reasoning, using linguistic equivalents of fuzzy numbers (shown in table1), the importance of the criteria that affect ILNP compared with each standard was identified by the expert panel to determine the weights of each measure. In the next step, the sub-criteria's importance was separately compared with each other to decide on the weights. Then, linguistic variables were converted to equivalent triangular fuzzy numbers (24). The completed matrices were analyzed using Chang's FAHP method (25).

The pairwise comparison matrix with fuzzy triangular numbers is expressed as follows:

$$\begin{bmatrix} (1,1,1) & (a_{12},b_{12},c_{12}) & \cdots & (a_{1n},b_{1n},c_{1n}) \\ (a_{21},b_{21},c_{21}) & (1,1,1) & \cdots & \vdots \\ \vdots & \vdots & \cdots & \vdots \\ (a_{n1},b_{n1},c_{n1}) & (a_{n2},b_{n2},c_{n2}) & \ldots & (1,1,1) \end{bmatrix}$$

The first component of each element in the matrix (a12) is the least, the second component (b12) is the mean, and the third component (c12) is the maximum number of a triangular fuzzy number.

Using the Fuzzy AHP to prioritize the criteria and sub-criteria

To calculate S_i for each row of the pairwise comparison matrix:

$$\tilde{S}_i = \sum_{j=1}^{m} \tilde{M}_{g_i}^{\ j} \otimes \left(\sum_{i=1}^{n} \sum_{j=1}^{m} \tilde{M}_{g_i}^{\ j} \right)^{-1}$$

Where i and j represent the row and column number and M_{gi}^{j} is the fuzzy triangular numbers of pairwise comparison matrices. The values of $\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^{i}$ and $\left[\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^{i}\right]^{-1}$ can be calculated by using the following equations, respectively:

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$$\left[\sum_{i=1}^{n}\sum_{j=1}^{m} M_{g^i}^{i}\right]^{-1}\left(\frac{1}{\sum_{i=1}^{n} u_i},\frac{1}{\sum_{i=1}^{n} m_i},\frac{1}{\sum_{i=1}^{n} l_i}\right)$$

$$\sum_{i=1}^{n}\sum_{j=1}^{m} M_{g^i}^{i}=\left(\sum_{i=1}^{n} l_i,\sum_{i=1}^{n} m_i,\sum_{i=1}^{n} u_i\right)$$

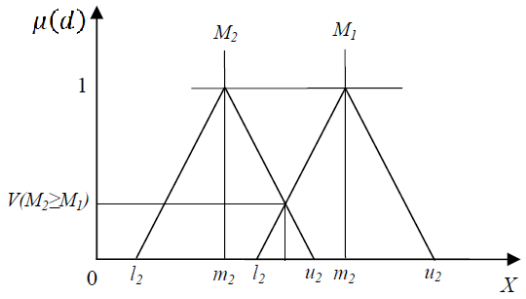
$$\left[\sum_{i=1}^{n}\sum_{j=1}^{m} m_{g^i}^{j}\right]^{-1}\left(\frac{1}{\sum_{i=1}^{n} u_i},\frac{1}{\sum_{i=1}^{n} m_i},\frac{1}{\sum_{i=1}^{n} l_i}\right)$$

To calculate the magnitude of fuzzy triangular numbers:

Where l_i, m_i, and u_i are the first, second, and third components of the fuzzy triangular numbers.

In the next step, if $M_1 = (l_1,m_1,u_1)$ and $M_2 = (l_2,m_2,u_2)$ are two triangular fuzzy numbers, the magnitude of M_1 with respect to M_2 calculated as follows:

$$\mu(d)=\begin{cases}1 & m_2 \geq m_1\\ \dfrac{u_1-l_2}{(u_1-l_1)-(m_2-l_2)} & otherwise\\ 0 & l_1 \geq u_2\end{cases}$$



On the other hand, the magnitude of a triangular fuzzy number from k as another triangular fuzzy number can be obtained by the following formula:

$$V(M \geq M_1,M_2,\cdots,M_K)=V\left[(M \geq M_1)and\,(M$$

$$i=1,2,3.\cdots,k$$

To calculate the weight of the criteria, alternatives, and weight vector:

The following equation was used to compute the weight of the various criteria:

$$d'(A_i)=MinV(S_i \geq S_k) \qquad k=1,2,\cdots,n$$

$$k \neq i$$

Finally, the normalized weight can be calculated as follows:

$$A_i=(i=1,2,\cdots,n)$$

$$W'=\left(d'(A_1),d'(A_2),\cdots,d'(A_n)\right)^{\tau}$$

$$W=\left(d(A_1),d(A_2),\cdots,d(A_n)\right)^{\tau}$$

Repeating step 3 in case of consistency ratio being higher than 0.1

Furthermore, each pairwise comparison matrix's consistency ratio (CR) was calculated and returned to the experts if it was higher than 0.1 (26). The CR allowed us to check the reliability and prevent experts from making inconsistent judgments.

CR = Consistency Index / Random Consistency Index

$$CI=\frac{\lambda_{max}-n}{n-1}$$

The λ_{max} or principal eigenvalue can be computed by averaging the matrix eigenvector. The RI value for matrices by different dimensions is presented in Table 2.

N: Number of items in the comparison matrix

Descriptive and analytical analyses and exploratory factor analysis were performed in $SPSS_{19}$, and the fuzzy analytic hierarchy process was conducted using MATLAB software. The study was carried out from May to December 2019 and received ethical approval from the Ethics Committee of Mazandaran University of Medical Sciences, Iran. (Code: IR.MAZUMS.REC.1398.066).

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Table 1. Linguistic variables and equivalent fuzzy triangular numbers

Linguistic Variables	Triangular fuzzy numbers	Triangular fuzzy numbers (Reciprocals)
Equal importance	(1, 1, 1)	(1.0, 1.0, 1.0)
Moderate importance	(2, 3, 4)	(1.4, 1.3, 1.2)
Strong importance	(4, 5, 6)	(1.6, 1.5, 1.4)
Very strong importance	(6, 7, 8)	(1.8, 1.7, 1.6)
Extreme importance	(9, 9, 9)	(1.9, 1.9, 1.9)
Intermediate values	(1, 2, 3), (3, 4, 5), (5, 6, 7), and (7, 8, 9)	(1.3, 1.2, 1.0), (1.5, 1.4, 1.3), (1.7, 1.6, 1.5), and (1.9, 1.8, 1.7)

Table 2. Random Consistency Indices (RCI) for different numbers of criteria or comparison matrix dimensions

N	2	3	4	5	6	7	8	9	10
RI	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.51

Results

Based on the systematic review of the literature, we found 26 items that affect ILNP. The panel of experts revised grammatical and semantic problems in the items. The impact score of each item (3.1 -3.7) was appropriate. Both CVI (0.82 - 0.86) and CVR (0.67 - 1) indicators for each item were higher than the acceptable threshold. Based on these results, all items had a friendly face and content validity.

In the next stage of this study, 250 (232 females, 18 male) nurses with a mean age of 32.67 ± 6.28 and an average of seven years of work experience answered the questionnaires. The first part of the questionnaire consisted of questions about the demographic and occupational characteristics of the participants. There was no significant mean difference between male and female nurses' income (pp = 0.875) and the shift hours (P-value = 0.985). However, single nurses also had higher mean income (P-value < = 0.001) and more work shift hours (P-value < = 0.001) than married nurses. Age (P-value < = 0.001) and education level (P-value = 0.032) had a reverse significant relationship with the income. The work experience had a significant reverse relationship with both income and shift hours (P-value < = 0.001). The shift hours (P-value < = 0.001), as well as income (P-value = 0.041) of nurses with a second job, were significantly higher than other nurses. Details of the participant's demographic characteristics are presented in Table 3.

The second part of the questionnaire consisted of 26 items about LNP. Due to the significant correlation between items, we performed the EFA with Promax rotation. The communality and factor loading of items was higher than 0.4; therefore, none were eliminated. The extracted structures were named by the panel of experts as (Figure 1) "personal issues," "organizational issues," "managerial issues," and "side issues," and twenty-six sub-criteria.

In the next stage of the study, FAHP was used to rank the factors and items that were renamed as criteria and sub-criteria, respectively. Five paired comparison matrices were designed based on the hierarchical structure. The first paired comparison matrix was related to the comparison of the criteria, and the other four forms were associated with the contrast of each criterion's sub-criteria. Using FAHP, the weights of criteria and sub-criteria were calculated. FAHP results showed that "personal issues" had the highest impact, while "side issues" had the lowest impact on the ILNP (53.39 % vs. 13.40 %). The normalized weights of the criteria and sub-criteria have been presented in Table 4.

a) Random Consistency Index b) Lambda c) Consistency Index d) Consistency Ratio

Moreover, according to the results of the study (Table 4), the findings of the study were consistent. The consistency index (CI) of all

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matrices was lower than the random consistency index (RCI). Also, the principal eigenvalue of all matrices is very close to each matrix dimension's magnitude, and the consistency ratio (CR) for each matrix lower than 0.1 indicates that all pairwise comparisons were reasonably well and consistent.

Table 3. Occupational and Demographic Characteristics of the participants in the study

Demographic Variable	Number (%)	Characteristics	Mean (SD)
Gender		**Age**	32.67 ± 6.28
Male	18 (7.2)	**Medium Work Shift**	28.24 ± 3.15
Female	232 (92.8)	**Average Experience**	7.09 ± 1.12
Marital Status			
Single	50(20.0)		
Married	200(80.0)		
Level of Education			
Bachelor	243(97.2)		
Master	7(2.8)		
Service Ward			
General ward	224(89.6)		
Critical Ward	26(10.4)		
Work Shift			
In Circulation	237(94.8)		
Morning Shift	13(5.2)		
The desire for Another Job			
Yes	13(94.8)		
No	237(5.2)		
Working for Another Job			
Yes	5(2.0)		
No	245(98.0)		

Table 4. Weight of the Criteria and Sub-Criteria that Affect Leaving the Nursing Profession

Criteria and Sub-Criteria		Normalized Weight	Number of Dimensions	RI (a)	λ (b)	CI (c)	CR (d)
Criteria	Personal Issues	53.39	4	0.90	4.250	0.084	0.093
	Management Issues	17.26					
	Organizational Issues	15.94					
	Side Issues	13.40					
Personal Issues	Job Stress	36.45	6	1.24	6.540	0.108	0.087
	Job Dissatisfaction	23.74					
	Feeling Frustrated	13.25					
	Physical Illness	10.41					
	Having No Interest in place of Work	8.77					
	Emotional Exhaustion	7.37					
Managerial Issues	Lack of Freedom of Action and Independence in Clinical Work	29.19	6	1.24	6.600	0.120	0.097
	Inappropriate Employment Status	24.36					
	Insufficient Income	24.21					
	Poor Management of the Profession	9.02					
	Insufficient Workforce	8.53					
	Restriction on Job Promotion	4.70					

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Criteria and Sub-Criteria		Normalized Weight	Number of Dimensions	RI (a)	λ (b)	CI (c)	CR (d)
Organizational Organizational Issues of the Profession Profession	Discrimination	30.33	8	1.41	8.961	0.137	0.097
	Undesirable Social Status in the Organization	14.45					
	Lack of Proper Communication between Employees (Managers, Physicians, and so on) in the System	14.18					
	Insecurity and Violence at the Workplace	11.38					
	Inappropriate Work Environment Conditions	7.96					
	Lack of Reward and Promotion System	7.95					
	Lack of Organizational Loyalty and Commitment	7.83					
	Lack of Organizational Support	5.91					
Side Issues	Likelihood of Catching Physical (Chronic, Acute) Illness	34.67	6	1.24	6.510	0.102	0.082
	Imbalances in Family and work Life	27.25					
	Probability of Catching Mental Illnesses	19.77					
	Long Working Hours	10.99					
	Drawing A Non-Scientific Position for Nurses	4.14					
	Lack of Opportunity to Learn, Empower, and Train the Employees	3.19					

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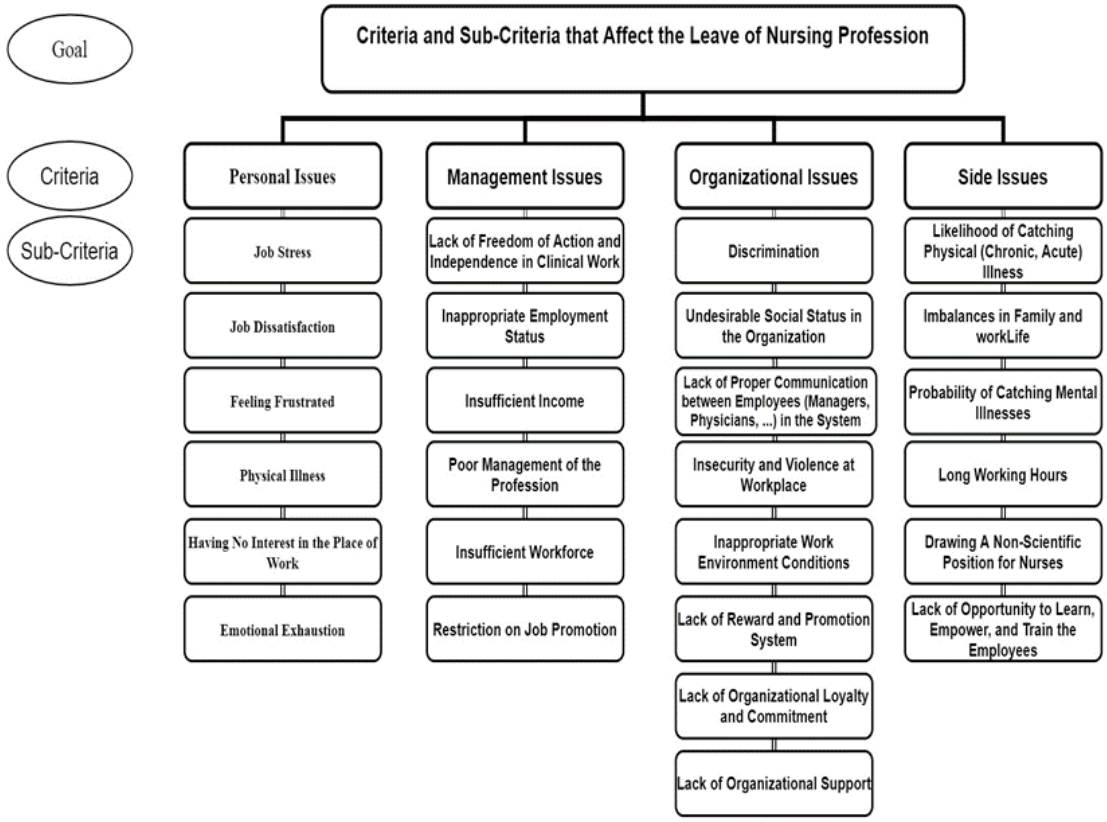

Figure 1. AHP hierarchical structure ranking nurses' intention to leave

Discussion

The primary purpose of the literature review was to investigate the reasons nurses leave their job or the intention to leave. The results of the various studies are different from each other. The main reason accountable for this difference is the variation in the research context and environment.

In this study, the personal issues criterion was ranked highest as the most critical reason supporting nurses' tendency to leave the profession. Within these criteria, job stress's sub-criteria were implicated as the top reason nurses left the profession. Congruent to this finding, Chiang et al. (27) , in their study, concluded that stress was the most crucial factor in nurses' decision to leave the profession. The early years of professional practice are usually stressful for newly graduated nurses and could be a crucial deciding period for most—either to leave or to remain in service. During such critical moments, experienced nurses must provide the needed social support and encouragement to their junior colleagues (28, 29). A previous study has demonstrated that job stress has a direct negative impact on performance, affects job satisfaction, and is an essential factor in nurses' willingness to leave work (30). Although emotional exhaustion ranked least among the criteria of personal issues, a study conducted in Turkey shows that it plays a predictive role in nurses' intention to leave the job (2). Other factors under personal issues such as job stress, job dissatisfaction, and emotional exhaustion have a bilateral relationship with the person and the organization. In other words, the individual characteristics of the nurse are useful in the emergence of these factors. On the other hand, executive actions can help intensify or weaken these factors.

Managerial issues, which ranked next to personal issues, encompass essential factors such

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as lack of freedom of action and clinical work independence. Classified as the most critical sub-criteria, its position confirms previous findings, which report that the existence of a fair performance evaluation system and increased independence at the workplace minimizes intention to leave (30). Other studies suggest that an environment full of respect and authority is among the most important predictive factors in leaving the job among the nurses (4).Although rated low among the investigated cases, restriction on a job promotion tends to influence the desire to leave the profession. The results of a study by Rubel et al(31). shows that with high chances of acquiring promotions, there is a significant decrease in the need for nurses to leave their job. A similar study conducted in Iran supports this current finding, reporting that the suppression of people's progress is among the factors affecting the desire to leave work among the nurses (13). If an organization does not increase its employees' chance of promotion, it may lose them quickly. Promotions give a degree of professional mobility in an organization to employees and reduce the desire to leave the job.

According to results among the organizational issues, discrimination is the highest-ranked sub-criteria, showing that discrimination at the workplace could influence nurses' decision to leave the job. The results of a study in Taiwan show that the existence of justice at the workplace acts as a protective factor against nurses' intention to leave their profession (30). Similarly, Valizadeh et al (7). found that discrimination in the work environment is one of the essential factors contributing to nurses' desire to leave the nursing profession. Discrimination affects cooperation among nurses. Although sometimes downplayed, it can significantly impact the nurses' motivation to stay or leave their profession (32). Nurses react to immoral behaviors in various ways that could ultimately lead to negative consequences in the organization, such as leaving or leaving the profession (33). When nurses find themselves exposed to injustice due to discrimination, their passion and commitment to work in the organization decreases gradually over time, and the thought of leaving the organization increases.

As the lack of organizational support emerged, the least ranked sub-criteria, the study by Fochsen et al(34)., found that the lack of supportive colleagues, managerial authorities, and supervisors is among the important reasons for nurses' intention to leave the job. Tuckett et al(35). also found that the lack of support from management or colleagues contributes significantly to nurses' decision to relocate their job. The likelihood of catching a physical illness is ranked the highest among the category. Although the side issues criteria, in general, have the least impact on ILNP, its contribution is highlighted by the previous studies. For example, previous studies reported that paying attention to nurses' health and psychological stressors effectively curb nurses' tendency to leave the profession (36, 37). The lack of opportunity to learn, empower and train the employees had the lowest rating among the investigated cases. Perhaps, this finding could be justified so that the nurses in Iran continuously participate in continuing educational programs and continually update their knowledge (38). Therefore, this sub-criterion has less been considered by the participants in the present research. This study is limited in generalizability since the literature only focuses on the studies conducted in a particular geographical area.

Conclusion

Job stress, the lack of freedom and independence in the clinical environment, discrimination, and the probability of catching an illness have higher prominence in influencing nurses' tendency to leave work. These factors can be mitigated by changing the managerial techniques within organizations. Therefore, we suggest that managers and decision-makers consider these factors in nursing career planning by putting effective interventions in place and providing a less stressful environment. With these in place, it is expected that fewer nurses leave their

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job. According to this study, improving the practice environment makes it easier for hospitals to reduce nursing turnover and retain nurses. Nurses who are mostly satisfied with the practice environment are less likely to suffer the intention to leave. Therefore, the following management strategies are suggested to reduce leaving the profession in nurses:

•Reducing overtime and eliminating mandatory overtime

•Ensuring adequate nurse staffing levels and supporting acuity-based staffing tools

•Recognizing nurses' need for work-life balance

•Encouraging and developing a workplace culture of collaboration between nurses and physicians

Decision-making is a systematic approach, and we cannot consider components of the problems separately. In other words, there is a correlation between the elements of decision-making in the real world. However, the traditional AHP can be considered the proposed model's particular case when the correlation effect between criteria is ignored.

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Conflict of interests

The authors declared that they have no conflict of interests.

Authors' contributions

Hosseini Marznaki Z, Barzegari S, Khanjankhani Kh designed research; Azarnivand M collected data; Hosseini Marznaki Z and Jawula Salisu W analyzed data; and Barzegari S wrote the manuscript. All authors read and approved the final manuscript.

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References

1. Potira S, Siskou O, Spinthouri M, Theodorou M. Factors Influencing Nurses' Intention to Leave their Profession in the Midst of the Economic Crisis in Greece. Adv Practice Nurs. 2019; 4(154): 2573. doi: 10.4172/2573-0347.
2. Arslan Yurumezoglu H, Kocaman G. Predictors of nurses' intentions to leave the organisation and the profession in T urkey. J Nurs Manag. 2016; 24(2): 235-43. doi: https://doi.org/10.1111/jonm.12305.
3. Juraschek SP, Zhang X, Ranganathan V, Lin VW. Republished: United States Registered Nurse Workforce Report Card and Shortage Forecast. AM J MED QUAL. 2019; 34(5): 473-81. 4. Lee YW, Dai YT, Chang MY, Chang YC, Yao KG, Liu MC. Quality of work life, nurses' intention to leave the profession, and nurses leaving the profession: A one-year prospective survey. J Nurs Scholarsh. 2017; 49(4): 438-44.
5. Pickler RH. Year of the Nurse: Take the Challenge. Nurs Res. 2020; 69(1): 12. doi: 0.1097/NNR.0000000000000394.
6. Shamsi A, Peyravi H. Nursing shortage, a different challenge in Iran: A systematic review. Med J Islam Repub Iran. 2020; 34: 1-9.
7. Valizadeh L, Zamanzadeh V, Habibzadeh H, Alilu L, Gillespie M, Shakibi A. Experiences of Iranian nurses that intent to leave the clinical nursing: a content analysis. Int J Caring Sci. 2016; 5(2): 169. doi: 10.15171/jcs.2016.018.
8. Gaudenz C, De Geest S, Schwendimann R, Zúñiga F. Factors associated with care workers' intention to leave employment in nursing homes: A secondary data analysis of the Swiss Nursing Homes Human Resources Project. J Appl Gerontol. 2019; 38(11): 1537-63.
9. Wu L, Low M, Tan K, Lopez V, Liaw S. Why not nursing? A systematic review of factors influencing career choice among healthcare students. INT NURS REV. 2015; 62(4): 547-62. 10. Holland P, Tham TL, Sheehan C, Cooper B. The impact of perceived workload on nurse satisfaction with work-life balance and intention

[DOI: 10.18502/jebhpme.v5i2.6558]

to leave the occupation. APPL NURS RES. 2019; 49: 70-6.
11. Buerhaus P, Staiger D, Auerbach D. The future of the nursing workforce in the United States: Data, trends and implications: Jones & Bartlett Publishers; 2009.
12. Marć M, Bartosiewicz A, Burzyńska J, Chmiel Z, Januszewicz P. A nursing shortage–a prospect of global and local policies. INT NURS REV. 2019; 66(1): 9-16.
13. Valizadeh L, Zamanzadeh V, Habibzadeh H, Alilu L, Gillespie M, Shakibi A. Threats to nurses' dignity and intent to leave the profession. NURS ETHICS. 2018; 25(4): 520-31.
14. Maranate T, Pongpullponsak A, Ruttanaumpawan P. The prioritization of clinical risk factors of obstructive sleep apnea severity using fuzzy analytic hierarchy process. Comput Math Method M. 2015; 2015: 13.
15. Nazari S, Fallah M, Kazemipoor H, Salehipour A. A fuzzy inference-fuzzy analytic hierarchy process-based clinical decision support system for diagnosis of heart diseases. Expert Syst Appl. 2018; 95: 261-71.
16. Ahmed F, Kilic K. Fuzzy Analytic Hierarchy Process: A performance analysis of various algorithms. Fuzzy Set Syst. 2019; 362: 110-28.
17. Farzanegan R, Farzanegan B, Alehashem M, Zangi M, Kalhori SRN, Sheikhy K, et al. Item selection and content validity of the risk factors of post-intubation tracheal stenosis observation questionnaire for ICU-admitted patients. Tanaffos. 2017; 16(1): 22.
18. Lin Y-H, Chang L-R, Lee Y-H, Tseng H-W, Kuo TB, Chen S-H. Development and validation of the Smartphone Addiction Inventory (SPAI). PloS one. 2014; 9(6). doi: 10.1371/ journal. pone.0098312.
19. Maasoumi R, Lamyian M, Montazeri A, Azin SA, Aguilar-Vafaie ME, Hajizadeh E. The sexual quality of life-female (SQOL-F) questionnaire: translation and psychometric properties of the Iranian version. Reprod Health. 2013; 10(1): 1-6. doi: 10.1186/742-4755-10-25.
20. Lawshe CH. A quantitative approach to content validity. Pers Psychol. 1975; 28(4): 563-75.
21. Kim J-O, Ahtola O, Spector PE, Mueller CW. Introduction to factor analysis: What it is and how to do it: Sage; 1978.
22. Sun C-C. A performance evaluation model by integrating fuzzy AHP and fuzzy TOPSIS methods. Expert Syst Appl. 2010; 37(12): 7745-54.
23. Schmidt K, Aumann I, Hollander I, Damm K, von der Schulenburg J-MG. Applying the Analytic Hierarchy Process in healthcare research: A systematic literature review and evaluation of reporting. BMC Med Inform Decis Mak. 2015; 15(1): 112.
24. Liberatore MJ, Nydick RL. The analytic hierarchy process in medical and health care decision making: A literature review. Eur J Oper Res. 2008; 189(1): 194-207.
25. Chang D-Y. Applications of the extent analysis method on fuzzy AHP. Eur J Oper Res. 1996; 95(3): 649-55. doi: 10.1016/0377-2217(95) 00300-2.
26. Wedley WC. Consistency prediction for incomplete AHP matrices. Math Comput Model. 1993; 17(4-5): 151-61.
27. Chiang Y-M, Chang Y. Stress, depression, and intention to leave among nurses in different medical units: Implications for healthcare management/nursing practice. Health Policy. 2012; 108(2-3): 149-57.
28. Salisu WJ, Dehghan Nayeri N, Yakubu I, Ebrahimpour F. Challenges and facilitators of professional socialization: A systematic review. Nursing Open. 2019; 6(4): 1289-98.
29. Flinkman M, Salanterä S. Early career experiences and perceptions–a qualitative exploration of the turnover of young registered nurses and intention to leave the nursing profession in Finland. J Nurs Manag. 2015; 23(8): 1050-7.
30. Chin W, Guo Y-LL, Hung Y-J, Hsieh Y-T, Wang L-J, Shiao JS-C. Workplace justice and intention to leave the nursing profession. Nurs Ethics. 2019; 26(1): 307-19.

[DOI: 10.18502/jebhpme.v5i2.6558]

31. Rubel MRB, Kee DMH. Perceived fairness of performance appraisal, promotion opportunity and nurses turnover intention: The role of organizational commitment. Asian Soc Sci. 2015; 11(9): 183. doi:10.5539/ass.v11n9p183.
32. Valizadeh L, Zamanzadeh V, Irajpour A, Shohani M. " Discrimination", the Main Concern of Iranian Nurses over Inter-Professional Collaboration: an Explorative Qualitative Study. Int J Caring Sci. 2015; 4(2): 115- 23. doi: 10.15171/jcs.2015.012.
33. Shohani M. Strategies of Iranian nurses to overcome professional discrimination: An explorative qualitative study. Nurs Ethics. 2019; 26(1): 235-47.
34. Fochsen G, Sjögren K, Josephson M, Lagerström M. Factors contributing to the decision to leave nursing care: A study among Swedish nursing personnel. J Nurs Manag. 2005; 13(4): 338-44.
35. Tuckett A, Winters-Chang P, Bogossian F, Wood M. 'Why nurses are leaving the profession… lack of support from managers': What nurses from an e-cohort study said. INT J Nurs Pract. 2015; 21(4): 359-66. doi: 10.1111/ ijn.12245.
36. Hayward D, Bungay V, Wolff AC, MacDonald V. A qualitative study of experienced nurses' voluntary turnover: Learning from their perspectives. J Clin Nurs. 2016; 25(9-10): 1336-45. 37. de Oliveira DR, Griep RH, Portela LF, Rotenberg L. Intention to leave profession, psychosocial environment and self-rated health among registered nurses from large hospitals in Brazil: a cross-sectional study. BMC Health Serv Res. 2017; 17(1): 17-21. doi: 10.1186/s12913-016-1949-6.
38. Shahhosseini Z, Hamzehgardeshi Z. The facilitators and barriers to nurses' participation in continuing education programs: A mixed method explanatory sequential study. Glob J Health Sci. 2015; 7(3): 93-184. doi: 10.5539/ gjhs.v7n3p184.

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