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The role of work schedule characteristics in shaping nurses' emigration intention in Iran

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Abstract

Background: Nurse emigration exacerbates the growing nursing shortage. As undesirable work schedules are linked to job burnout and emigration intention, this study aimed to comprehensively investigate the association between work schedule characteristics and nurses' intent to emigrate in Iran.

Methods: This was a cross-sectional study conducted on 560 nurses working in the medical and surgical wards of four affiliated university hospitals in the eastern part of Iran in 2025. Sampling was performed using a multistage cluster sampling method with proportional allocation, followed by simple random sampling within each ward. Data were collected using a demographic questionnaire, an adapted tool from the Trinkoff instrument for work schedule characteristics, and a dichotomous question (Yes/No) assessing intent to emigrate. Data analysis was performed using logistic regression in Stata software version 17, with a significance level of $P < 0.05$.

Results: A total of 39.1% of nurses reported an intent to emigrate. In the adjusted model, daily working hours of 13 to 18 hours were associated with a significantly increased intent to emigrate (OR = 2.12; 95% CI: 1.12 - 3.99). Nurses working rotating shifts had a higher likelihood of intent to emigrate compared with those working morning shifts (OR = 2.89; 95% CI: 1.73 - 4.83), and this likelihood was even higher among those working combined morning and night shifts (OR = 5.26; 95% CI: 2.54 - 10.89). Furthermore, quick returns (short rest periods between shifts) were identified as a significant predictor (OR = 2.16; 95% CI: 1.28 - 3.65).

Conclusion: The findings of this study indicate that long daily working hours, rotating and combined shifts, and quick returns are among the most significant factors associated with nurses' intent to emigrate. Recommendations for health policymakers and administrators include implementing strict limits on daily working hours to eliminate quick returns and restructuring schedules to significantly increase predictability and nurse autonomy. Addressing these stressors can reduce emigration intent and enhance healthcare system stability.

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Highlights

What is current knowledge?

- Unfavorable work schedules are generally linked to burnout and nurses' intention to leave their jobs.
- Nurse emigration is a global crisis, particularly affecting healthcare systems in developing countries.

What is new here?

- Long daily shifts (> 12 hours) and combined morning-night shifts are powerful predictors of emigration intention.
- Quick returns between shifts and short notice for mandatory overtime are also significantly associated with nurses' desire to emigrate.
- This study comprehensively models multiple scheduling factors, identifying the strongest drivers within the Iranian nursing context.

Introduction

The World Health Organization (WHO) projects a global nursing shortage of approximately 4.5 million by 2030 (1). The sustained emigration of nurses to developed countries continues to deepen the healthcare workforce crisis in developing nations (2). Emigration of specialized nurses exacerbates health inequalities by skewing the source country's workforce toward less experienced staff, thereby undermining service quality and healthcare access (3,4). Emigration intention is defined as an individual's stated plan or positive response regarding the prospect of moving to live or work in a foreign country (5,6). The intention to emigrate often correlates with actual emigration, particularly when conditions in the destination country align with personal goals (7). Working conditions are an influential factor in nurses' emigration intention (8,9).

Within this context, work schedule characteristics represent a key dimension of working conditions. Work schedule characteristics are the set of measurable features of an employee's work time arrangement, including the length and timing of work periods, the sequence and variability of shifts, the adequacy of rest and recovery between work episodes, and the predictability and advance notice of scheduling. These characteristics influence worker health, safety, performance, and social and family life (10-13). Long working hours and high workloads are linked to increased job stress, burnout, and a greater intention to emigrate (9,14). Furthermore, rotating and night shifts, which often cause sleep disturbances and reduced quality of life, decrease job satisfaction and increase emigration intent. In addition, a lack of flexibility and limited control over work schedules further reinforce job turnover and emigration (15,16).

Global evidence indicates that undesirable work schedule characteristics are directly linked to circadian rhythm disruption, sleep deprivation, and fatigue. These physiological disruptions subsequently increase the risk of adverse physical and psychological outcomes (17). Such outcomes include burnout, occupational accidents, and chronic conditions such as cardiovascular and metabolic disorders (17). At the organizational level, these schedules are associated with job dissatisfaction, burnout, and turnover, without improving productivity compared with shorter shifts (18-21). For patients, long and rotating shifts are associated with decreased quality of care, increased missed care, medical errors, unsafe events, and lower satisfaction (21-24). Therefore, evidence-based schedule management is essential for protecting nurse health, ensuring organizational stability, and improving patient safety (18,25).

Although studies have investigated the general outcomes of undesirable work schedules, less attention has been paid to the precise role of specific schedule characteristics in nurses' decision-making processes regarding emigration. For instance, temporal characteristics such as morning - night shifts and quick returns (< 11 hours between shifts) have been increasingly highlighted in recent research as factors associated with reduced sleep quality, increased fatigue, and impaired performance (26-29); however, they have received less attention within the context of emigration decisions.

On the other hand, medical and surgical wards are high-engagement environments in which nurses may spend up to 34% of their time in direct patient care (30). Furthermore, the high patient-to-nurse ratios commonly observed in medical and surgical wards are a key component of job strain. These high ratios are associated with decreased quality of care and adverse patient outcomes (31,32). Since these structural factors are not easily modifiable, studying modifiable variables such as work schedule characteristics is essential, particularly in these high-pressure wards.

Therefore, this study aims to fill this gap by determining the relative role of each work schedule characteristic in predicting nurses' emigration intention among nurses working in medical and surgical wards. Understanding these characteristics can inform policies aimed at nurse retention, shift optimization, and improved human resource management in healthcare systems.

Methods

This cross-sectional study was conducted from January to May 2025 in four teaching hospitals affiliated with Mashhad University of Medical Sciences. The study population comprised all nurses working in the medical and surgical wards of these hospitals. Inclusion criteria included nurses who had at least six months of work experience in the selected wards of the respective hospitals and who provided informed consent to participate in the study. Exclusion criteria consisted of nurses who submitted incomplete or flawed questionnaires or whose data were unusable for any reason.

Based on the guideline proposed by Bujang et al. (2019) for logistic regression in observational studies with large populations, a minimum of 500 participants is recommended to achieve estimates with minimal bias in the coefficients. The guideline also suggests the "Events Per Variable (EPV) = 50" and "n = 100 + 50i" rules of thumb, where "i" represents the number of independent variables in the final model (33). Considering 8 independent variables (i = 8), the minimum required sample size was estimated as n = 100 + (50 × 8) = 500. In line with these recommendations, and accounting for the design effect of cluster sampling and an anticipated 10% attrition rate, a total of 600 questionnaires were distributed. Of these, 573 were returned, yielding a 95.5% response rate. After excluding 13 questionnaires due to incompleteness or insufficient data, a final sample of 560 participants was used for the analysis. This number fell within the recommended range and was deemed appropriate for achieving the study objectives (Figure 1).

Data were collected using two questionnaires and one specific question. The demographic information questionnaire included a series of questions regarding nurses' personal and professional characteristics, covering items such as gender, marital status, number of children, having young children, educational level, and employment type. To assess the intention to emigrate, a dichotomous question was used: "Do you intend to emigrate abroad? (Yes/No)".

The primary instrument for measuring work schedule characteristics was a tool adapted from the Trinkoff instrument (2011). This tool covers various dimensions of nurses' work schedules. In the present study, the translation process was conducted using the forward-backward method. Following the translation, the content validity of the instrument was established by 10 faculty members from the School of Nursing, who evaluated each item for its clarity, simplicity, and relevance. The Item-Content Validity Index (I-CVI) and the Content Validity Ratio (CVR) were calculated to ensure the appropriateness and representativeness of the items in measuring the intended work schedule characteristics. Reliability was assessed using the test-retest method with a two-week interval. The stability of responses over time was evaluated for each item using Pearson's correlation coefficient. As shown in the results table, all items demonstrated excellent test-retest reliability, with correlation coefficients ranging from 0.833 to 0.995, and all were statistically significant ($p < 0.001$).

In accordance with the study's objectives, eight items were used to capture various dimensions of work schedules (34). The assessed characteristics were: (1) average daily working hours, (2) average weekly working hours, (3) predominant shift type, (4) number of quick returns to work (With <10 hours between shifts), (5) frequency of working while sick, (6) notification time for mandatory overtime, (7) frequency of working on official holidays, and (8) frequency of working on weekends. Measurements for daily and weekly hours were recorded on numerical scales. Items pertaining to the frequency of specific schedule disruptions (Quick returns, working while sick, holiday/weekend work, and overtime notification time) were measured based on their occurrence over a specified timeframe. Shift type was evaluated using a categorical scale including: "Morning," "Evening," "Night," and various combined shift patterns. Reliability, evaluated using a two-week test-retest interval, was excellent, with Pearson correlation coefficients for all items ranging from 0.83 to 0.99.

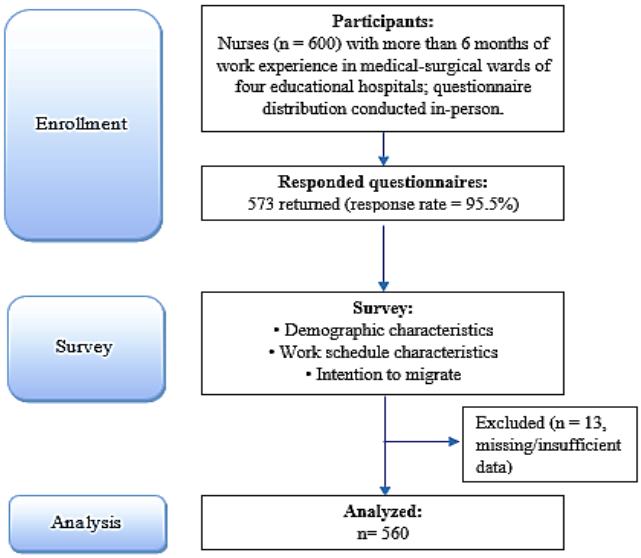

Figure 1. Study sampling

Data collection

This study employed a multistage cluster sampling method with proportional allocation to ensure representative selection of participants.

Stage 1: Selection of clusters (Hospitals)

From the total population of 14 teaching hospitals affiliated with Mashhad University of Medical Sciences, four hospitals were selected non-randomly. This selection was based on variations in working conditions and the diversity of clinical units across the selected hospitals.

Stage 2: Proportional allocation (Wards)

Within the selected hospitals, the target population was limited to nurses working in medical and surgical wards. Collaboration with hospital nurse managers and supervisors was established to estimate the total number of eligible nurses in these units. The required sample size for each ward was then determined proportionally to the ward's size relative to the total estimated nurse count across all four hospitals. This approach ensured that each ward contributed proportionally to the overall sample size.

Stage 3: Selection of participants

Following proportional allocation, researchers physically visited the wards. Monthly work schedules were reviewed by the research team to screen eligible nurses based on the predefined inclusion criteria. Final participant selection was achieved through simple random sampling (Using random number generation) from the list of eligible nurses in each ward. This rigorous process ensured that the principle of proportional representation was strictly maintained.

Data collection

Finally, selected nurses were approached to obtain written informed consent, ensuring that participation was voluntary and confidential. Coded, self-administered questionnaires were then distributed to the nurses.

Data analysis

The collected data were analyzed using Stata software version 17. Following data entry, the main variables were defined and coded. To compare demographic characteristics between groups with and without emigration intent, the chi-square test or Fisher's exact test was used for categorical variables, and the Mann-Whitney U test was applied for non-normally distributed quantitative variables. The association between emigration intent and work schedule characteristics was examined using binary logistic regression with crude and adjusted models. The significance level for all statistical tests was set at $P < 0.05$.

Results

A total of 560 nurses were included in the study, of whom 219 (39.1%) reported an intention to emigrate (Table 1). Nurses with emigration intent were significantly younger, with a median age of 30 years (IQR = 13) compared with 36 years (IQR = 16) among those without emigration intent ($P < 0.001$). Similarly, work experience was shorter in nurses with emigration intent, with a median of 5 years (IQR = 8) versus 7 years (IQR = 13) in those without emigration intent ($P < 0.001$).

A higher proportion of nurses holding a bachelor's degree reported emigration intent compared with those without emigration intent (94.98% vs. 90.32%, P = 0.046). Employment type was also significantly associated with emigration intent ($P = 0.014$), with a higher proportion of nurses enrolled in the Mandatory Service Program for Newly Graduated Nurses (Tarh Program) in this group. No significant differences were observed between the two groups in terms of gender, marital status, having children, ward, patient load, or income satisfaction ($P > 0.05$).

To investigate associated factors, we performed binary logistic regression analyses using crude and adjusted models, with emigration intent as the dependent variable (Table 2). In the adjusted model, working 13 - 18 hours daily was associated with a significantly higher likelihood of emigration intent compared with the reference group (OR = 2.12; 95% CI: 1.12 - 3.99). Each additional weekly work hour was associated with an increased likelihood of emigration intent (OR = 1.01; 95% CI: 1.00 - 1.02). Working weekends three times per month (OR = 3.56; 95% CI: 1.94 - 6.53) or four times per month (OR = 5.49; 95% CI: 2.69 - 11.18) also significantly increased emigration intention.

Rotating shifts (OR = 2.89; 95% CI: 1.73 - 4.83) and combined "morning + night" shifts (OR = 5.26; 95% CI: 2.54 - 10.89) were also associated with a higher likelihood of emigration intent. Experiencing at least one quick return per week was associated with an increased risk of emigration intent (OR = 2.16; 95% CI: 1.28 - 3.65). Working while sick more than once per week was also a significant factor, increasing the likelihood of emigration intent (OR = 3.48; 95% CI: 1.32 - 9.15). Short notice for mandatory overtime (< 2 hours) was likewise significantly associated with emigration intent (OR = 2.44; 95% CI: 1.15 - 2.16). In contrast, working on official holidays showed no significant association with emigration intent ($P > 0.05$).

Table 1. Comparison of demographic variables between nurses with and without emigration intention (N = 560)

Demographic variables			Emigration intention		Total	Test	P-value
			No (n=341)	Yes (n=219)			
Gender	Male	N (%)	90 (26.39%)	157 (71.69%)	-	Chi-square	0.619
	Female		251 (73.61%)	62 (28.31%)			
Marital status	Single	N (%)	78 (22.87%)	66 (30.14%)	-	Chi-square	0.055
	Married		263 (77.13%)	153 (69.86%)			
Age	Years	Median (IQR)	36 (16)	30 (13)	33 (15)	Mann-Whitney	< 0.001
Kids	Number	Median (IQR)	1 (2)	1 (2)	1 (2)	Mann-Whitney	0.462
Young kid (< 3)	No	N (%)	266 (78.01%)	164 (74.89%)	-	Chi-square	0.393
	Yes		75 (21.99%)	55 (25.11%)			
Work experience	Years	Median (IQR)	7 (13)	5 (8)	6 (12)	Mann-Whitney	< 0.001
Patient per shift	Number	Median (IQR)	7 (2)	7 (2)	7 (2)	Mann-Whitney	0.811
Level of education	Bachelor	N (%)	308 (90.32%)	208 (94.98%)	-	Chi-square	0.046
	Master		33 (9.68%)	11 (5.02%)			
Type of employment	Permanent*	N (%)	198 (58.06%)	102 (46.58%)	-	Fisher's exact	0.014
	Service-based (Tarhi)*		69 (20.23%)	71 (32.42%)			
	Agency-based*		47 (13.78%)	23 (10.50%)			
	Contractual*		13 (3.81%)	12 (5.48%)			
	Probationary*		13 (3.81%)	11 (5.02%)			
	Clause-based*		1 (0.29%)	0 (0.00%)			
Department	Medical	N (%)	139 (40.76%)	97 (44.29%)	-	Chi-square	0.409
	Surgical		202 (59.24%)	122 (55.71%)			
Level of satisfaction about income	Very low	N (%)	209 (67.29%)	133 (60.73%)	-	Fisher's exact	0.833
	Low		74 (21.70%)	51 (23.29%)			
	Moderate		54 (15.84%)	31 (14.16%)			
	High		4 (1.17%)	4 (1.83%)			
	Very high		0 (0.00%)	0 (0.00%)			

* Permanent: Long-term state employment; Service-based (Tarhi): Mandatory post-graduation service; Agency-based: Employment via outsourcing; Contractual: Fixed-term employment under contract; Probationary: Probationary government employment with potential permanence; Clause-based: Employment under special or exceptional legal provisions; IQR: Interquartile range; Levels of significance: $P < 0.05$.

Table 2. Crude and adjusted logistic regression models for the association of work schedule characteristics with emigration intention (N = 560)

Emigration intention	Crude model		Adjusted model*	
	OR (CI 95%)	P-value	OR (CI 95%)	P-value
Hours worked per day				
1-6 hours (Reference)				
7-12 hours	1.06 (0.95, 1.18)	0.241	1.07 (0.96, 1.19)	0.118
13-18 hours	2.11 (1.10, 4.03)	0.023	2.12 (1.12, 3.99)	0.020
19-24 hours	1.18 (0.47, 2.97)	0.711	1 (0.37, 2.66)	1.000
Hours worked per week	1.02 (1.00, 1.03)	0.001	1.01 (1.00, 1.02)	0.037
Number of weekends worked per month				
0 (Reference)				
1	2.04 (0.88, 4.73)	0.093	2.03 (0.87, 4.71)	0.098
2	2.33 (1.04, 5.17)	0.038	2.47 (1.10, 5.51)	0.027
3	2.39 (1.07, 5.34)	0.033	2.53 (1.12, 5.67)	0.024
4	3.00 (1.27, 7.07)	0.012	2.92 (1.23, 6.93)	0.015
Shift type				
Day only (Reference)				
Evening only	2.70 (0.95, 7.70)	0.062	2.05 (0.70, 5.99)	0.188
Night only	1.52 (0.81, 2.82)	0.185	1.42 (0.75, 2.68)	0.276
Day + Evening	3.56 (1.94, 6.53)	< 0.001	3.04 (1.63, 5.64)	< 0.001
Day + Night	5.49 (2.69, 11.18)	< 0.001	5.26 (2.54, 10.89)	< 0.001
Night + Evening or all three	3.37 (2.06, 5.51)	< 0.001	2.89 (1.73, 4.83)	< 0.001
Quick return				
Never (Reference)				
A few times a year	0.93 (0.49, 1.78)	0.847	0.92 (0.48, 1.76)	0.810
Once a month	0.71 (0.38, 1.32)	0.284	0.68 (0.36, 1.28)	0.236
Every other week	0.20 (0.59, 2.44)	0.596	1.16 (0.57, 2.35)	0.670
Once a week	2.08 (1.22, 3.55)	0.007	2.00 (1.17, 3.41)	0.011
More than once a week	2.24 (1.33, 3.76)	0.002	2.16 (1.28, 3.65)	0.004
Working on a scheduled day off/Vacation day				
Never (Reference)				
A few times a year	1.25 (0.51, 3.09)	0.618	1.28 (0.51, 3.17)	0.587
Once a month	1.01 (0.40, 2.52)	0.977	1.02 (0.40, 2.55)	0.962
Every other week	1.46 (0.64, 3.29)	0.360	1.45 (0.64, 3.29)	0.371
Once a week	1.73 (0.77, 3.86)	0.177	1.76 (0.78, 3.94)	0.168
More than once a week	1.78 (0.77, 4.14)	0.175	1.85 (0.79, 4.32)	0.151
Working while sick				
Never (Reference)				
A few times a year	1.11 (0.47, 2.65)	0.797	1.15 (0.48, 2.75)	0.743
Once a month	1.34 (0.54, 3.30)	0.519	1.33 (0.53, 3.30)	0.533
Every other week	2.00 (0.63, 6.35)	0.235	1.96 (0.61, 6.27)	0.255
Once a week	3.23 (1.04, 10.07)	0.042	3.27 (1.04, 10.24)	0.041
More than once a week	3.47 (1.33, 9.04)	0.011	3.48 (1.32, 9.15)	0.011
Mandatory overtime notice				
Never (Reference)				
Yes, with more than an 8-hour notice	0.96 (0.60, 1.54)	0.897	0.99 (0.61, 1.59)	0.976
Yes, with 2- to 8-hour notice	1.33 (0.76, 2.33)	0.316	1.38 (0.78, 2.43)	0.261
Yes, with less than a 2-hour notice	2.30 (1.10, 4.83)	0.027	2.44 (1.15, 5.16)	0.019

* Variables included in the adjusted model were age, work experience, educational attainment, and employment type (levels of significance: P < 0.05).

Discussion

The findings of the present study revealed a substantial prevalence of emigration intent among the sampled nurses (39.1%), along with clear associations with specific sociodemographic and occupational factors. Nurses who expressed an intention to emigrate were significantly younger, had less professional experience, and included a higher proportion of individuals with a bachelor's degree and those participating in governmental service plans. Furthermore, a clear association was identified between emigration intent and adverse work schedule characteristics, including long daily working hours (13 - 18 hours), quick returns, rotating shift patterns, frequent weekend work, working while sick (Presenteeism), and receiving short notice for mandatory overtime.

The present study showed that daily working hours exceeding 12 hours (13 - 18 hours) were significantly associated with nurses' emigration intent. Weekly working hours were also associated with emigration intent, although the magnitude of this association was modest (Approximately 1%). Thus, long daily shifts appear to play a more prominent role among work-time indicators. These findings are consistent with international evidence. Griffiths et al. (2014) demonstrated that shifts of 12 hours or longer are associated with higher levels of dissatisfaction, burnout, and turnover intention (35). Similarly, Vedaa et al. (2022) reported that quick returns and long workdays significantly increase job turnover (36). An African review by Adam et al. (2025) also found that long working hours create unsafe work environments, contribute to burnout, and increase nurse emigration (37). Collectively, this evidence suggests that long working hours and quick returns are common and influential factors driving nurse turnover and emigration across diverse healthcare contexts.

In this study, 39.1% of nurses reported an intention to emigrate, with weekend work identified as one of the associated factors. In comparison, a study conducted in Nigeria by Ajayi et al. (2025) found that more than 89% of nurses expressed a desire to emigrate (38). Although the prevalence reported in that study was considerably higher, both studies highlight unfavorable work schedules, such as excessive working hours and frequent weekend work, as important drivers of emigration intent. Despite differences in prevalence rates, the findings collectively underscore that unfavorable work schedules, including unsocial hours and mandatory weekend work, are consistent predictors of emigration intention across different socioeconomic contexts.

With regard to shift type, nurses working rotating or combined shifts demonstrated a higher propensity to emigrate. Previous studies have shown that rotating shifts are associated with poorer sleep quality, higher stress levels, and increased emotional exhaustion among nurses. These factors contribute to job dissatisfaction and burnout, which are often precursors to emigration intent (39,40). The present findings are

consistent with those of Salehi et al. (2023) in Iran, who reported that rotating shifts were associated with a poorer work environment and higher emigration intent (14). In terms of age, the current study also found that younger nurses were more likely to intend to emigrate. Similarly, Yürümezoğlu et al. (2024) in Turkey reported that long and unpredictable working hours contribute to job fatigue, prompting younger nurses to seek emigration in pursuit of shorter and more flexible work schedules (15).

The present study identified a significant association between working while sick and emigration intent. Although this factor has been less frequently examined in the literature, Qingsen He et al. (2025) reported that presenteeism is associated with burnout and turnover intention among nurses (41). Presenteeism refers to situations in which employees attend work despite illness, physical or psychological discomfort, work pressure, or other adverse conditions, yet are unable to perform optimally or maintain their usual level of productivity (42).

Additionally, the study demonstrated that short notice for mandatory overtime (< 2 hours) was significantly associated with emigration intent. Although this variable has received limited attention in international research, this finding is comparable to those reported by Yürümezoğlu et al. (2024), who identified a lack of control over work schedules and unpredictability as key drivers of emigration intent (15).

Although not directly examined in this study, working on official holidays may disrupt work-life balance (43,44). However, in the present study, working on official holidays showed no significant association with emigration intent. This finding may be attributable to the normalization of holiday work within the Iranian healthcare context or to its relatively uniform distribution among nurses.

Overall, a review of recent literature confirms the decisive role of work schedules in nurse emigration. A systematic review by Toyin-Thomas et al. (2023) showed that long working hours are a primary reason for emigration from low- and middle-income countries, while flexible working hours act as a key pull factor (16). Therefore, the present study reinforces and extends previous findings. The similarity of our results with studies from Europe, the Middle East, Africa, and Asia indicates the global nature of pressures arising from work patterns. However, the stronger associations observed in Iran are likely attributable to local factors such as the severe nursing shortage, high patient-to-nurse ratios, and a lack of legal protections, which intensify these burdens.

Among the limitations of this study, it should be noted that work schedule data were self-reported over a six-month period, which introduces the potential for recall bias. Furthermore, emigration intent was measured using a single dichotomous question, which precluded a more detailed analysis of its complex dimensions (e.g., intensity, timing, or planning). The study's focus on medical and surgical nurses in four university hospitals also limits the generalizability of the findings to other specialties or regions. Finally, some potential contextual factors influencing individual decision-making, such as personal economic conditions or direct access to overseas job opportunities, may not have been fully captured or controlled for in this cross-sectional design.

Conclusion

This study concludes that specific adverse work schedule characteristics are significant predictors of nurses' emigration intent. These factors include long daily working hours, quick returns, rotating shifts, and a lack of control over mandatory overtime.

Modifying these detrimental work patterns represents a crucial and actionable policy lever for retaining the nursing workforce. Recommendations include the development of structured personnel planning guidelines for nurse managers to ensure that schedules minimize quick returns, excessively long shifts, and frequent rotations. In addition, training nurse managers on the impact of scheduling practices on outcomes such as emigration intention is essential. Implementing predictable and flexible scheduling while addressing these organizational stressors can effectively enhance staff retention and reduce emigration intent.

Future research should focus on developing and evaluating interventions, including digital tools or applications for nurse managers, that facilitate effective work schedule design. Such studies should consider specific scheduling characteristics and their impact on outcomes such as staff turnover and emigration intention.

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Ethical statement

This study was approved by the Research Ethics Committee of Mashhad University of Medical Sciences (ethics code: IR.MUMS.NURSE.REC.1403.076). Written informed consent was obtained from all participants prior to their inclusion in the study. All participants were assured of the confidentiality of their personal and professional information, and participation was entirely voluntary. All ethical guidelines were strictly followed throughout the study in accordance with the Declaration of Helsinki.

Conflicts of interest

The authors declare no conflicts of interest.

Author contributions

M. A. K.: Conception of the study idea, Data collection, and Preparation of the manuscript; F. H. N. (Corresponding author): Study conceptualization, Supervision, and Revision of the manuscript; R. A.: Statistical expertise and Data analysis; H. H. M.: Contribution to the study methodology design; A. A.: Assistance with instrument validation. All authors reviewed and approved the final version of the manuscript.

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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