BMC Medical Education

RESEARCH

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From classroom to workforce: a discrete choice analysis of Iranian nursing students' job preferences

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Abstract

Aims This study evaluates both financial and non-financial preferences of nursing students to choose a hospital for work in future.

Background In Iran's healthcare system, the persistent shortage and uneven distribution of nurses have been significant challenges. Addressing such issues requires attention to nurses' preferences, which can be instrumental in designing effective interventions.

Methods In this cross-sectional study, 500 nursing students from Kermanshah University of Medical Sciences (KUMS) were surveyed using a convenience sampling method to determine their preferences for selecting the type of hospital in which they wish to work in the future. The study was conducted during the second half of 2023 using a discrete choice experiment (DCE) approach. To identify the most influential components on future nurses' preferences, conditional logistic regression analysis was employed.

Results The study revealed that an ideal and preferred hospital for nursing students is one that offers a high monthly salary, is located close to their homes, provides Rasmi contracts, has adequate facilities and equipment, has a low workload, and requires less than three years for career advancement. Additionally, the results indicated that the highest willingness to pay (WTP) was associated with the type of employment in the hospital, with nursing students willing to reduce their monthly salary by 27,303,610 IRR to change their employment status from Gharardadi to Rasmi.

Conclusions The study confirmed that both financial and non-financial factors significantly influence nursing students' choices regarding their future workplace. This research can serve as a valuable reference for future studies in this area. The findings can significantly aid in designing and implementing effective interventions aimed at retaining nurses in hospitals and attracting and keeping nursing staff in underserved areas.

Keywords Nursing students, Willingness to pay, Discrete choice analysis, Job preferences, Career choice

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Introduction

The productivity of human resources is a paramount concern for managers in contemporary organizations, and optimizing these resources is pivotal for attaining sustainable development, particularly within service-oriented entities [1]. Within the healthcare sector—crucial to any community—human resources are instrumental in delivering optimal health and medical services to the populace. It is incumbent upon the sector's strategists and decision-makers to guarantee the availability of an ample number of adept and proficient professionals in pertinent occupational roles when necessary. A sufficient number of such experts is crucial for ensuring that the health system operates effectively and efficiently, ultimately enabling the provision of high-quality healthcare services [2, 3].

On one hand, the scarcity of human resources in the healthcare sector constitutes a significant barrier to realizing the highest attainable standard of health service provision. This scarcity hinders the fulfillment of health objectives and the delivery of services that are both timely and of appropriate quality [4]. Conversely, an overabundance and surplus of these resources can lead to substantial challenges, particularly concerning the financial burdens placed on health service providers and, by extension, the health system as a whole [5]. Among the diverse professional groups within hospitals, nurses stand out as the most substantial cohort delivering health and medical care services, primarily due to their extensive, direct, and sustained interaction with patients. Consequently, strategic planning to ensure an adequate supply of nursing staff is of paramount importance [6, 7]. A disequilibrium between nurse supply and demand precipitates either a deficit or an excess of available nurses. The global nursing shortage encompasses both developed and developing nations, presenting a universal challenge [8]. In the absence of strategies focused on staff retention, the fundamental shortfall in nursing personnel is likely to persist and potentially deteriorate over time [9].

A conducive work environment is a significant determinant of nurses' willingness to engage in their profession, as the performance of nursing duties is influenced by the work setting, which can foster favorable results and ensure job security [10]. Health policymakers and nursing administrators can utilize insights derived from the attributes of the work environment to strategize for a vibrant workforce in the future [11]. The clinical work environment encompasses an array of information, the allocation of resources, the establishment of support systems, and the provision of opportunities for learning, as well as the enhancement and fortification of personnel skills. This comprehensive approach encourages nurses to commit to their roles with an enhanced sense of cooperation and satisfaction [12]. The diminution of healthcare personnel constitutes a critical issue within contemporary healthcare systems. Additionally, the unequal distribution of healthcare workers, favoring metropolitan areas over remote or non-metropolitan regions, has escalated into a grave concern, necessitating prioritized intervention [13, 14]. The World Health Organization has underscored the necessity for governments to enact focused strategies on recruitment and retention to address the health sector's human resource deficit effectively [15]. Although this is a worldwide problem, low- and middle-income nations have undertaken significant endeavors to devise optimal solutions for the recruitment and maintenance of healthcare staff in traditionally underserved areas [16, 17].

In Iran, the simultaneous occurrence of nursing shortages and their inequitable distribution [18] presents a significant concern for administrators and constitutes a core challenge for the healthcare infrastructure. Despite the Iranian Ministry of Health and Medical Education's (MoHME) initiatives to expand the capacity and development of nursing institutions, substantial obstacles persist in the recruitment and retention of human resources [19, 20]. A critical issue contributing to nursing shortages in Iran is the migration of nurses abroad [21]. Other factors include low social status, work-related injuries, early retirement, and job abandonment. The loss of skilled professionals not only diminishes the quality of care provided to patients but also undermines efforts to improve health outcomes within the country. Consequently, comprehending the elements that affect nurses' motivation to stay employed is essential for guiding workforce strategy concerning the recruitment and retention of nursing staff [22]. Research conducted in Iran demonstrates that prioritizing rights and benefits, fostering a salubrious work setting, ensuring job security, and bolstering organizational backing are instrumental in diminishing nurses' propensity to resign and augmenting their professional contentment [9, 23, 24]. While the majority of these inquiries have concentrated on nurses' perceptions and reactions to their immediate work milieu, direct inquiries into nurses' genuine work environment preferences have not progressed beyond this preliminary phase.

In this study, job preference is conceptualized as an amalgamation of factors influencing an individual's propensity to favor one work setting over another. Job preferences are evaluated by examining the interplay between the attributes of the job and the personal inclinations of individuals concerning these attributes [25]. Furthermore, insights gleaned from job preference data empower employers to create more appealing work environments, thereby enhancing the recruitment of nurses and bolstering their retention within the organization [25].

Discrete choice experiments (DCEs) serve as effective policy instruments within health systems, facilitating the extraction of preferential data from healthcare personnel [26]. DCE assessments can discern which occupational attributes are deemed more or less significant by healthcare workers [27]. While a multitude of studies has utilized DCEs to evaluate nurses' preferences across various nations [19, 22, 25, 28, 29], only a pair of investigations—one in Korea (2016) and another in China (2019)—have specifically explored the preferences of nursing students regarding their choice of hospital [30, 31]. These studies commonly incorporate factors like workplace location, remuneration, accommodation, amenities and infrastructure, educational opportunities, managerial approach, hospital type, and prospects for advancement. In the present study, nursing students determine their preferred hospital employer by comparing the aforementioned characteristics.

Nursing students, poised to become future healthcare professionals, often lack detailed knowledge of the work environments available to nurses in hospitals. Their selection of hospitals is frequently based on geographical proximity to urban, suburban, or rural areas, rather than on critical factors that affect their professional setting. This imprecise prioritization could negatively impact the attraction and retention of nursing staff, particularly in areas with limited resources and support. No existing research in Iran has explored nursing students' hospital-type preferences. Consequently, this study aimed to investigate the hospital selection preferences of prospective nurses (current nursing students) through a DCE approach in 2023.

Method

Study setting

This cross-sectional study was conducted among nursing students at the Faculty of Nursing and Midwifery of Kermanshah University of Medical Sciences (KUMS) in Kermanshah province, located in western Iran, during the second half of 2023. In this province, similar to other provinces in Iran, healthcare services are overseen by the MoHME in partnership with KUMS.

Study population, sample size, sampling method and data collection

The study population included all first- to fourth-year undergraduate nursing students at KUMS. The sample size was calculated using the following formula [32]:

$$500 \leq \frac{nta}{c}$$

As per the above formula, the required sample size for the main effects is influenced the number of choice tasks (t), the total number of respondents (n), the number of alternatives (a), and the maximum number of levels for any attribute (c). In the current study, the sample size (n) was 500 nursing students, with 20 choice tasks (t), 2 alternatives (a), and 5 levels for the attributes (c). By substituting the numbers into the formula, the result was 4000, which exceeds the recommended minimum threshold of 500 for adequate sample size in DCE studies. The formula [32] also suggests that the minimum number of participants needed is 38, assuming each participant answers all scenarios. However, since the scenarios were divided into four versions, with each participant answering only one version, the minimum number of participants required is 152 (38×4).

Sampling was conducted using a convenience sampling method. Data collection was conducted face to face interview, based on the students' educational schedule, at the Nursing and Midwifery faculty, and in coordination with nursing instructors during classes. Due to the absence of the fourth-year students at the university, researchers visited the hospitals where these students were taking place to ensure they completed the questionnaires.

Survey design

This study employed a DCE to explore the preferences of nursing students regarding their future hospital employment choices at the KUMS. A schematic representation of all the steps conducted in the study is illustrated in Fig. 1. The DCE is a robust tool for evaluating individual decision-making processes [33]. This instrument can generate hypothetical scenarios where respondents choose between two alternatives, allowing researchers to determine the importance of various attributes based on these choices [34, 35]. Within the framework of the DCE, multiple choice sets are presented, each characterized by different attributes and levels [36]. Respondents are asked to indicate their preferred option for each choice set, typically encountering several such sets throughout the experiment [37].

Identifying and selecting attributes and its levels

To generate and refine the attributes and levels for the DCE, we employed a multifaceted approach, including a literature review and qualitative interviews. First, we conducted a comprehensive search in databases such as PubMed, Scopus, Google Scholar, and Web of Science, using keywords like "job preference", "nurses", "nursing students", and "discrete choice experiment". This initial literature review yielded a list of 18 potential attributes and their corresponding levels. Next, we carried out semi-structured and in-depth interviews with 10 final-year nursing students and 3 practicing nurses. The purpose of these interviews was to identify any additional relevant

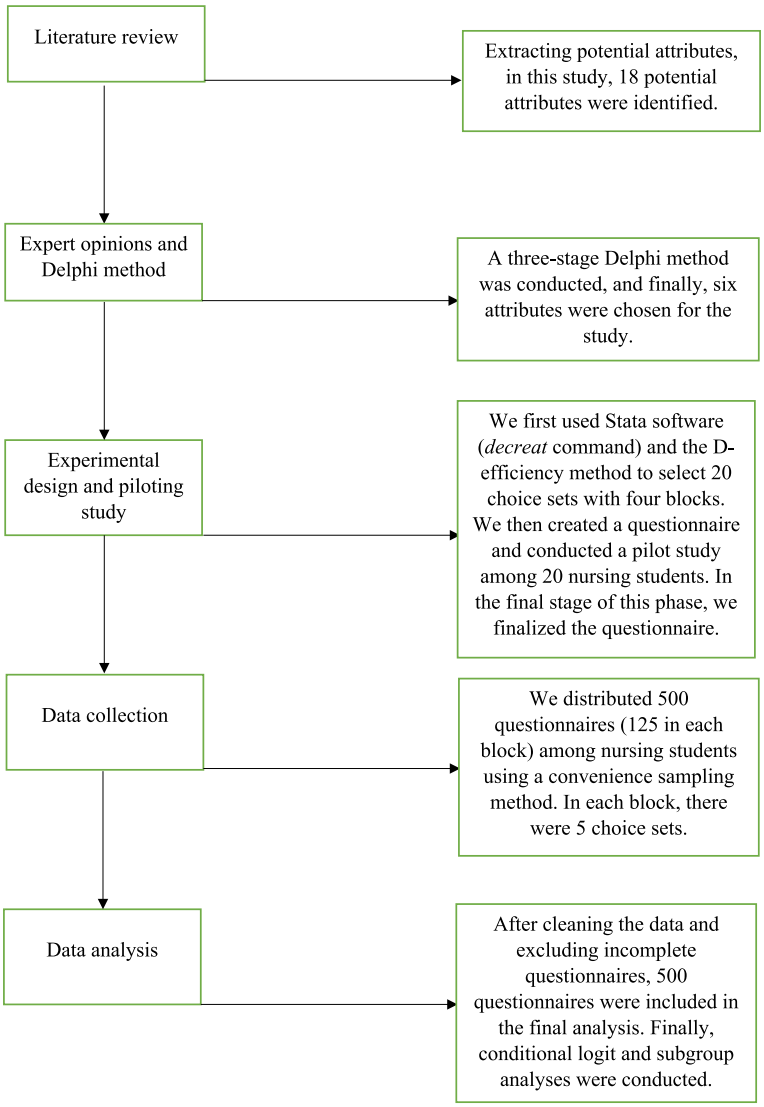

Fig. 1 A schematic overview of all steps in the study

attributes and to refine the accuracy and relevance of the attributes and their levels. The refined list of attributes was then presented to a panel of 20 individuals through the Delphi method, which consisted of three stages. This panel included 4 nursing service managers, 4 educational supervisors, 4 head nurses, 4 nurses, and 4 final-year nursing students. The scores for each attribute were then summarized to determine the overall score and rank. The process of selecting the levels for each attribute followed a similar approach. The panel of experts reviewed the proposed levels and provided feedback to ensure they were comprehensive and accurately represented the job preferences of nurses and nursing students. After this iterative refinement process, a final set of 6 attributes was included in the design of the DCE (Table 1).

Experimental design and piloting study

Considering one attribute with five levels and five attributes with three levels, there are 1215 ($5^1 * 3^5$) full factorial design. While a full factorial design can estimate all possible interactions between attributes, it is typically used when there is a limited number of attributes and levels, and the goal is to collect comprehensive information about all potential interactions.

From these items, using an orthogonal method and D-efficiency method, 20 choice sets were ultimately selected [38]. Additionally, various methods exist to assess the internal validity of DCEs [39]. In the design of this experiment, the dominant profile within each set was utilized to assess internal validity (internal consistency). Consequently, each block included six choice set rather than the original five. Within each block, the sixth

Table 1 Attributes and levels of the discrete choice experiment questionnaires

Attributes	Level
Monthly Salary	• 20% decrease in current salary
	• 10% decrease in current salary
	• Current salary
	• 10% increase in current salary
	• 20% increase in current salary
Commute time	• 15 min
	• 30 min
	• 45 min
Workplace facilities	• Poor
	• Average
	• Good
Workload	• Low
	• Moderate
	• Heavy
Type of employment contract[A]	• Rasmi
	• Paymani
	• Gharardadi
Time required for promotion to a higher position	• 1 to 3 years
	• 3 to 5 years
	• More than 5 years

According to the expert panel, the current average monthly salary for a nurse working at a hospital was determined to be 120,000,000 Iranian Rials (IRR). During the data collection period, the official exchange rate of the dollar was set at 42,000 Iranian rials per dollar (https://www.cbiir/ExRates/rates_enaspx)

[A] Rasmi is a type of job contract usually made between the government and its workers, and it lasts permanently. This means it is longer than the other two types of contracts. Peymani is a contract that is in between Rasmi and Gharardadi regarding how long it lasts. On the other hand, Gharardadi is a temporary contract that can be very short, sometimes lasting only three months

Table 2 Example of a choice set: block 1

Attributes	Choice A	Choice B
Salary	Current salary	10% decrease in current salary
Commute time	30 min	15 min
Workplace facilities	Poor	Average
Workload	Moderate	Heavy
Type of employment	Rasmi	Paymani
Time required for promotion to a higher position	More than 5 years	3 to 5 years
Which choice do you prefer?	☐ **Yes**	☐ **No**

Rasmi is a type of job contract usually made between the government and its workers, and it lasts permanently. This means it is longer than the other two types of contracts. Peymani is a contract that is in between Rasmi and Gharardadi regarding how long it lasts. On the other hand, Gharardadi is a temporary contract that can be very short, sometimes lasting only three months

choice set was employed to evaluate internal validity. In this sixth choice set, all attributes in Hospital B were presented as the best option; therefore, if a student nurse opted for Hospital A, it indicated that they had not completed the questionnaire with sufficient attention. Participants who failed the internal validity assessment were removed from the data analysis, and the dominant choice set was excluded from consideration in the analysis.

The minimum choice set in this study was determined based on the following formula [40]:

$$S \geq \frac{k}{j-1}$$

Where k is the total number of parameters (equal to 14 in this study), j is the number of alternatives (equal to 2 in this study), and S represents the minimum choice set. Therefore, the minimum choice set should be at least 14 cases. In this study, 20 choice sets were defined. We utilized Stata's *dcreate* command to generate 20 choice sets [38]. The *dcreate* command employs the modified Fedorov algorithm to produce efficient designs for DCEs. As an example, one of them is shown below in Table 2.

A total of 20 choice sets (hypothetical hospitals) with statistically independent attributes were created in four blocks. Participants were required to respond to one of the four versions randomly. A pilot study was conducted on the developed questionnaires, involving 20 participants (5 nursing students per block) from the nursing student population. Following this preliminary investigation, adjustments were made to the questionnaire, resulting in the final version, which was then distributed for data collection.

Data analysis

The DCE is grounded in the theoretical framework of random utility theory [41]. According to this theory, an individual will select a particular choice option if and only if the utility derived from that option is higher than the utility of the alternative options. For instance, if a nursing student chooses a more developed work hospital over a less developed one, it suggests that the more developed hospital provides greater utility. In our study, we compared various alternatives to the hospital choosing using a conditional logit regression model as follow. Unlike simple logistic regression, discrete choice modeling employs a linear model to predict choices based on the attributes of the alternatives, rather than solely on subject characteristics.

$$U_i = \beta_1 salalry_i + \beta_2 contract_i + \beta_3 facility_i + \beta_4 commute_i + \beta_5 workload_i + \beta_6 timepromotion_i + \epsilon_i$$

where $U_i$is the dependent variable in the model. U represents a subjective variable that cannot be directly calculated but can be compared across alternatives. β_1 is the coefficient related to the monthly salary; β_2 is the coefficient related to the type of contract; β_3 is the coefficient related to the facilities and amenities of the hospital; β_4 is the coefficient related to the time required to reach the hospital; β_5 is the coefficient related to the workload; β_6 is the coefficient related to the time required for promotion and Finally, ϵ_i represents the error term in the model.

Willingness to pay (WTP)

Willingness to pay (WTP) refers to the amount an individual is prepared to spend for a change in an attribute associated with monetary value. It measures the readiness to accept an increase or decrease in compensation for a preferable option and/or to avoid a less desirable one. In our analysis, we calculated WTP by taking the ratio of the coefficient of a specific attribute to the salary attribute, assessing this under two hypothetical scenarios. This approach helped determine how much a person values a particular level of the same attribute. Positive results indicate the extent to which participants are willing to pay or sacrifice for a particular attribute level, while negative results reflect the minimum compensation participants expect for that same attribute level. During the data collection period, the official exchange rate of the dollar was set at 42,000 Iranian rials per dollar (https://www.cbiir/ExRates/rates_enaspx).

P-values below 0.05 were considered significant. All calculations were conducted using STATA SE software version 17. To determine WTP, we utilized the *wtp* command in STATA.

Results

The study sample consisted of 500 nursing students with an average age of 22.48 years. Most of these students were unmarried and resided in urban areas. About 70% of the participants described their household's financial situation as middle-class or average. The detailed demographic characteristics of the study participants are presented in Table 3.

Table 3 Characteristics of the respondents ($n = 500$)

Characteristics	*n*	%
Age (Mean ± SD)	22.48 ± 2.78	
Gender		
Male	264	52.80
Female	236	47.20
Marital status		
Single	468	93.60
Married	32	6.40
Living area		
Urban	486	97.20
Rural	14	2.80
Academic year		
First-year	145	29.00
Second- year	123	24.60
Third-year	114	22.80
Fourth-year	118	23.60
Household Economic Status		
Very poor	13	2.60
Poor	140	28.00
Middle	314	62.80
Good	21	4.20
Very good	12	2.40

SD is the standard deviation

Findings of the preferences of job attributes of nursing students

Table 4 presents the results of the conditional logit model analysis. This model provides the parameter estimates and standard errors for the utility coefficients associated with the various attributes examined. Based on this model, different levels of the studied attributes influence utility, or preference, for nursing students. Of the six attributes included in the study, statistically significant levels were found for at least one attribute, which indicates that all the examined attributes are crucial factors in the job preferences of nursing students. The statistical significance of the coefficients suggests that each attribute level has a meaningful impact on the respondents' choices between the presented scenarios. When selecting a hospital to work at, nursing students consider not only the salary but also various non-monetary factors. They place particular emphasis on the type of employment contract, strongly favoring hospitals that offer contracts with Rasmi type. Additionally, nursing students highly value hospitals with commute time and workload. These non-economic job attributes appear to be just as important, if not more so, than the wage level when it comes to the job preferences of nursing students (Fig. 2). Figure 3 presents the ranking of job attributes based on the preferences expressed by the study participants. The attributes in the figure are arranged from the least preferred to the most preferred.

The ranked attributes from the perspective of nursing students regarding the choice of hospital type, categorized by gender, academic year, and household economic status, are illustrated in Appendix 1. As shown in Figure A (Appendix), a low workload is significantly more important for women compared to men, indicating that women place greater emphasis on this aspect. Additionally, women prioritize the time required to commute to work more than men

Table 4 The conditional logit analysis results related to the job attributes of the nursing students in Iran

Job attributes and their levels	Coefficient	SE	z	*P*-value	CI (95%)
Workplace facilities					
Poor	Ref.				
Average	−0.420	0.129	−3.25	0.001	−0.673 to −0.167
Good	0.284	0.132	2.14	0.032	0.544 to 0.025
Type of employment contract [A]					
Gharardadi	Ref.				
Paymani	0.103	0.127	0.80	0.422	−0.148 to 0.352
Rasmi	0.934	0.133	7.01	< 0.001	0.673 to 1.195
Workload					
Heavy	Ref.				
Moderate	0.486	0.121	4.02	< 0.001	0.249 to 0.723
Low	0.327	0.066	4.90	< 0.001	0.196 to 0.458
Time required for promotion to a higher position					
More than 5 years	Ref.				
1–3 years	0.433	0.142	3.03	0.002	0.153 to 0.713
3–5 years	−0.078	0.082	−0.97	0.334	−0.238 to 0.081
Commute time					
45 min	Ref.				
15 min	0.481	0.147	3.26	0.001	0.192 to 0.769
30 min	0.222	0.071	3.12	0.002	0.082 to 0.361
Monthly salary (1,000,000 IRR)[A]					
9.6	Ref.				
10.8	0.337	0.108	3.09	0.002	0.123 to 0.551
12	0.821	0.103	7.95	< 0.001	0.618 to 1.023
13.2	1.273	0.117	10.85	< 0.001	1.042 to 1.503
14.4	1.885	0.158	11.92	< 0.001	1.574 to 2.194
Number of respondents	500				
Number of observations	5,000				
Log-likelihood	−1252.83				
LR chi-square	960.06				
Prob > chi-square	< 0.001				
Pseudo R^2	0.277				
AIC	2533.6				
BIC	2624.9				

A: Note: During the data collection period, the official exchange rate of the dollar was set at 42,000 Iranian rials per dollar (https://www.cbiir/ExRates/rates_enaspx)

SE Standard error, *CI* confidence interval, *Ref* reference, *IRR* Iranian rial, *AIC* Akaike information criterion, *BIC* Bayesian information criterion

[A] Rasmi is a type of job contract usually made between the government and its workers, and it lasts permanently. This means it is longer than the other two types of contracts. Peymani is a contract that is in between Rasmi and Gharardadi regarding how long it lasts. On the other hand, Gharardadi is a temporary contract that can be very short, sometimes lasting only three months

do, preferring shorter travel times. Conversely, men attach greater importance to formal employment and a monthly income of 144,000,000 IRR compared to women. In relation to academic year (Figure B - Appendix), our study indicates that first-year students place more importance on a low workload in hospitals compared to other students, while fourth-year students prioritize formal and contractual employment more than their peers. Based on household economic status (Figure C - Appendix), the results indicate that individuals from poorer economic backgrounds place greater importance on formal and contractual employment compared to others. Individuals from middle-income backgrounds generally fall between those from poor and wealthy backgrounds across various factors. Wealthy individuals tend to prioritize higher income, shorter commuting times, and better facilities and amenities in hospitals more than others.

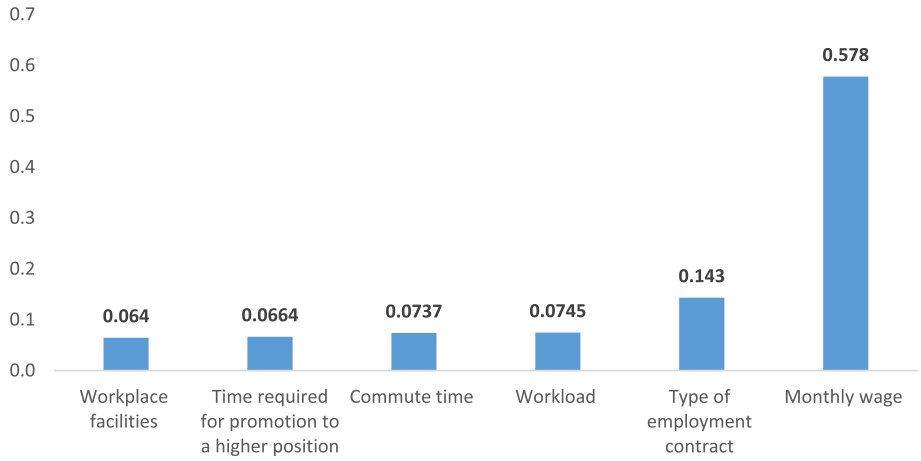

Fig. 2 Relative importance of attribute levels in the study

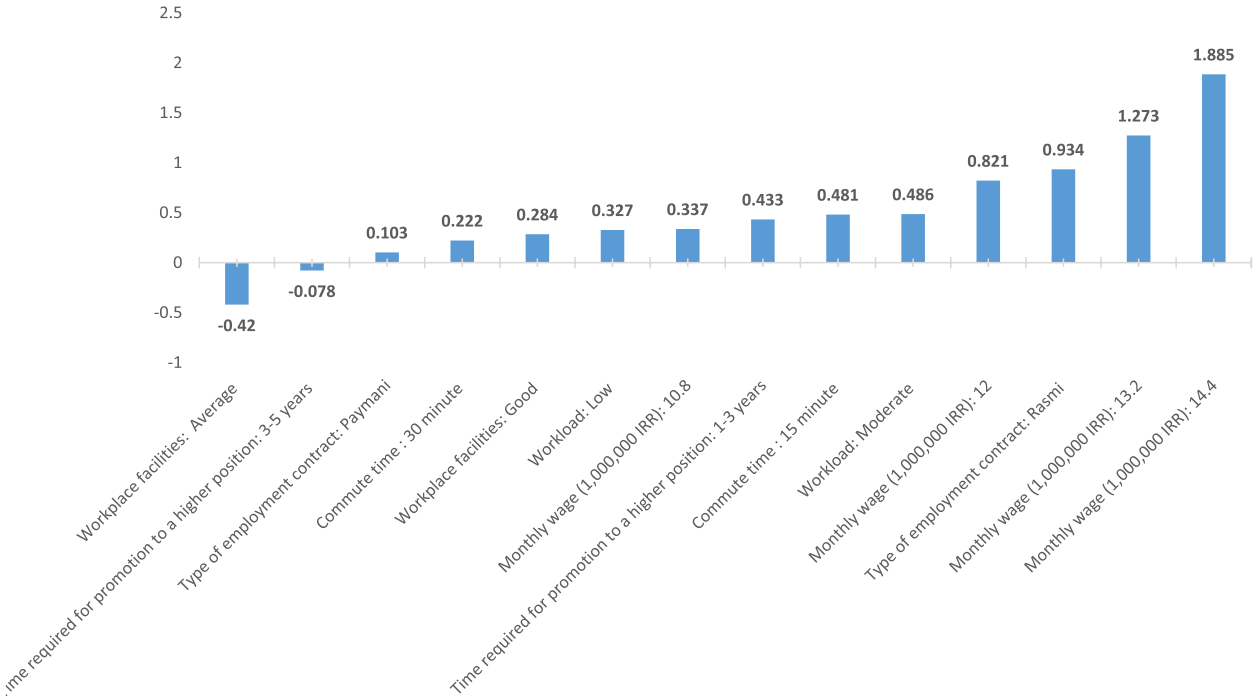

Fig. 3 Preferences rank of attributes used in the study. Note: During the data collection period, the official exchange rate of the dollar was set at 42,000 Iranian rials per dollar (https://www.cbiir/ExRates/rates_enaspx). In terms of type of employment, Rasmi is a type of job contract usually made between the government and its workers, and it lasts permanently. This means it is longer than the other two types of contracts. Peymani is a contract that is in between Rasmi and Gharardadi regarding how long it lasts. On the other hand, Gharardadi is a temporary contract that can be very short, sometimes lasting only three months

Willingness to pay for job attributes

The study also calculated the Willingness to Pay (WTP) to evaluate how respondents weigh different attribute levels against each other. WTP represents the highest amount an individual would be willing to pay for a specific attribute (positive sign in Table 5). This concept can also be understood as Willingness to Accept (WTA), which indicates how much of their monthly income respondents would be ready to give up to exchange one level of an attribute for another (negative sign in Table 5). Table 5 presents the findings of the willingness to pay (WTP) for selecting a future workplace among nursing students. According to the table, while controlling for other variables, the average participant is willing to give

Table 5 Willingness to pay (WTP) for choosing a hospital to work in the future among nursing students in Iran

Job attributes and their levels	WTP (IRR)[A]	95% confidence interval
Workplace facilities		
Poor	1	1
Average	8661574.2	3181319.4 to 14141829.0
Good	−5503168.4	−10,527,786 to −478550.9
Type of employment contract [B]		
Gharardadi	1	1
Paymani	−5313298.1	−10,370,624 to −255971.7
Rasmi	−27303610.0	−33813816.0 to −20793405.0
Workload		
Heavy	1	1
Moderate	−10490972.0	−15,371,343 to −5610601.5
Low	−8632855.9	−12,123,639 to −5142072.4
Time required for promotion to a higher position		
More than 5 years	1	1
1–3 years	−8772551.4	−13,888,553 to −3656549.7
3–5 years	2208051.1	−1934502.5 to 6350604.8
Commute time		
45 min	1	1
15 min	−9964074.8	−15145062.0 to −4783087.9
30 min	−5236477.0	−8905309.1 to −1567644.9

WTP is the willingness to pay

[A] During the data collection period, the official exchange rate of the dollar was set at 42,000 Iranian rials per dollar (https://www.cbiir/ExRates/rates_enaspx)

[B] Rasmi is a type of job contract usually made between the government and its workers, and it lasts permanently

This means it is longer than the other two types of contracts. Peymani is a contract that is in between Rasmi and Gharardadi regarding how long it lasts. On the other hand, Gharardadi is a temporary contract that can be very short, sometimes lasting only three months

up 27,303,610 IRR (95% CI: −33813816 to −20793405 IRR) from their monthly salary to change their contract type from Gharardadi to Rasmi. Furthermore, the study revealed that the WTP for a 15-minute commute was 9,964,075 IRR (95% CI: −15145062 to −4783087.9 IRR), while the WTP for a 30-minute commute was 5,236,477 IRR (95% CI: −8905309.1 to −1567644.9 IRR) compared to a 45-minute commute while controlling for other factors.

Discussion

This study represents the first attempt to conduct a DCE study among nursing students in Iran to explore their preferences regarding job attributes. Using DCE is advantageous as it allows for evaluating the respondents' stated preferences and willingness to choose rather than relying solely on their actual choices [42]. Choosing a job or a hospital to work as a nurse is a complex decision-making process, influenced by multiple factors and constrained by available resources (such as time, knowledge, budget, and geography), which requires individuals to make trade-offs to achieve the optimal outcome. The DCE methodology allows researchers to identify the relative strength of the factors that influence this decision-making process and examine the trade-offs made between these factors. Given the limited number of studies that have applied this approach in nursing students' research at the local and national levels in Iran, this study contributes valuable knowledge to the literature on examining nurses' job preferences in the future. The study's findings emphasize the importance of six attributes closely linked to the job preferences of nursing students, highlighting the crucial role these attributes play in shaping their career preferences. Our research findings demonstrate that the economic factor and monthly wage have the most substantial impact on job preferences among nursing students, which aligns with similar studies on job preferences conducted in various locations and across different healthcare workforce populations. Our research findings demonstrate that the economic factor and monthly wage have the most substantial impact on job preferences among nursing students, which aligns with similar studies on job preferences conducted in various locations and across different healthcare workforce populations [19, 22, 43–45]. The consistent emphasis on salary as a vital driver of job choice suggests that economic considerations remain a top priority for individuals when making career decisions in the healthcare field. Findings from other discrete choice experiment studies focused on nurses, conducted in countries such as Australia, Peru, Malawi, and Laos, have also emphasized the significance of higher earnings as a key factor in job preferences [46–49]. In contrast to the results of the present study, a separate investigation of medical faculty students in Ghana by Kruk et al. [50] yielded different results. Their study revealed that Ghanaian students valued accommodation and sufficient infrastructure the most, while the wage level was deemed the least important factor. It is important to note that the features of the healthcare system, as well as the culture, expectations, and needs of the population, can vary significantly across different countries and regions. As a result, the job preferences and priorities of healthcare workers regarding their working conditions may also show considerable variability when examined in studies conducted in different settings. The present study also found that non-economic factors such as type of employment, commute time, and workload play a significant role in nursing students' decisions when selecting a hospital to work at in the future. This finding is consistent with the conclusions drawn by Haddadfar et al. [19] in their research, which determined that a healthcare worker's job preference is heavily

influenced by both financial and non-financial considerations. They also concluded that apart from the higher salary and working in a city, the most desirable job for the participants would feature a Rasmi employment contract, a manageable workload, adequate facilities in the workplace, an appropriate work schedule, and the prospect of promotion within 1 to 3 years in the assigned role. According to our study on WTP, the highest monetary amount that nursing students were willing to sacrifice was observed for changing their employment contract type from Gharardadi to Rasmi. In this case, nursing students were willing to give up 27,303,610 IRR to transition from a Gharardadi contract to a Rasmi contract. This WTP value significantly exceeded other observed WTP values, indicating that this attribute has the utmost importance in nursing students' decision-making process within the scope of our study. Other attributes with high WTP were commute time and workload. Consistent with the results of the present study, previous research conducted in Iran [19] found that workload significantly influenced the career decisions of nurses. The results show that participants were willing to handle a heavy workload in exchange for a substantial increase in their monthly salary.

This study has some limitations that should be considered when interpreting the findings. Firstly, we assessed the preferences of the nursing students at a medical university in the west of Iran; thus, the result may not be generalizable to all Iranian nursing students. Furthermore, although factors like educational opportunities and work schedules could have been potentially relevant for inclusion in the study, they were not included due to limitations on the number of attributes that could be examined and the potential complexity they would introduce to the questionnaire design.

Conclusion

This DCE study provides strong evidence to policymakers in Iran regarding the job preferences of nursing students, particularly about their desired working conditions. The results emphasize that both financial and non-financial factors significantly influence the choices made by nursing students when considering a hospital to work. This study can be a valuable reference for future research in this field. However, the scope of subsequent studies could be expanded to include other healthcare professionals beyond just nursing students. Additionally, expanding the geographical coverage and increasing the sample size could provide a more comprehensive understanding of job preferences among future healthcare workers in Iran.

Abbreviations

DCE	discrete choice experiment
WTP	willingness to pay
WTA	willingness to accept
MoHME	Ministry of Health and Medical Education
KUMS	Kermanshah University of Medical Sciences
IRR	Iranian Rials

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12909-024-06612-7.

Supplementary Material 1.

Supplementary Material 2.

Acknowledgements

This work was performed in partial fulfillment of the requirements for Master of Science of Khadijeh Khosravi in faculty of Nursing and Midwifery of Kermanshah University of Medical Sciences, Kermanshah, Iran.

Authors' contributions

Author Contributions: Conceptualization, S.R, Kh. M., Kh. Kh., A. J. ; methodology, S.R, Kh. M and Kh., Kh.; formal analysis, S.R and Kh.M.,; writing—original draft preparation, S.R, Kh.M., A.J.,; writing—review and editing, S.r., and Kh. M.; All authors have read and agreed to the published version of the manuscript.

Funding

This study did not receive any specific funding from public, commercial, or non-profit organizations.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

The research protocol was reviewed and approved by the Research Deputy of Kermanshah University of Medical Sciences, with the approval number IR.KUMS.REC.1402.387. The study was conducted in full compliance with the ethical principles outlined in the Declaration of Helsinki. Before data collection began, the researchers verbally explained the study's purpose to each potential participant. Informed consent was obtained from all students prior to their participation in the study. Participants were informed of their right to withdraw from the study at any time without consequence.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 23 October 2024 Accepted: 26 December 2024
Published online: 03 January 2025

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