Original article

Turnover intention and associated factors among nursing students: A cross-sectional study

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Abstract

Background: The turnover intention among nursing students represents a critical concern with implications for the global nursing workforce shortage and healthcare service sustainability. Identifying associated factors is essential for informing evidence-based retention strategies.

Objectives: To determine the prevalence of turnover intention and examine its associated factors among nursing students in Central Vietnam.

Materials and Methods: A cross-sectional study was conducted among 280 nursing students in Central Vietnam. Data were collected via a structured self-administered questionnaire assessing intention to leave, personal interest, financial benefit consideration, career choice autonomy, family influence, and occupational risk perception. Spearman's correlation and multiple linear regression analyses were performed, with statistical significance set at $p < 0.05$.

Results: The mean turnover intention score was 9.57 ± 2.62 (range: 3–15). Regarding specific intentions, 40.4% frequently considered discontinuing their nursing career, 51.8% expressed a desire to pursue a healthcare career with no direct patient contact, and 51.8% reported not choosing nursing again if given the opportunity. Turnover intention was positively correlated with financial benefit perceptions ($r = 0.183$, $p < 0.01$) and occupational risk perception ($r = 0.219$, $p < 0.01$). Multiple linear regression identified financial benefit consideration ($\beta = 0{\cdot}185$, $p = 0{\cdot}007$), occupational risk perception ($\beta = 0{\cdot}236$, $p < 0{\cdot}001$), career choice autonomy ($\beta = -0{\cdot}225$, $p = 0{\cdot}001$), and family influence ($\beta = -0{\cdot}113$, $p = 0{\cdot}048$) as significant associated factors. The model explained 13.1% of the variance in turnover intention scores (Adjusted $R^2 = 0.115$, $p < 0.001$).

Conclusion: A substantial proportion of nursing students reported turnover intention. Targeted interventions addressing occupational risk concerns, financial reward perceptions, autonomous career decision-making, and family engagement may effectively reduce turnover intention and support long-term nursing workforce sustainability.

Keywords: *Nursing students; turnover intention; occupational risk perception; career choice autonomy; family influence; financial benefit consideration; Vietnam*.

1. INTRODUCTION

The global shortage of nurses poses serious and measurable threats to the sustainability of healthcare systems worldwide, placing increasing pressure on nursing education to support effective recruitment and retention [1]. A large-scale meta-analysis across 14 countries reported a global nurse turnover rate of approximately 16%, rising to nearly 19% in several Asian countries, underscoring widespread challenges to workforce stability [2]. Critically, this problem does not begin at the point of workforce entry. Nursing education programs worldwide have experienced persistently high dropout rates and early turnover intention, raising concerns about the long-term capacity of the nursing workforce [3-6]

Turnover intention refers to an individual's conscious consideration of leaving a profession in the future [7], was adopted as the primary outcome, given its relevance to workforce planning and its utility as a proxy for early career disengagement among enrolled students [4, 8, 9]. Although turnover intention has been more extensively studied in practicing nurses, a growing body of evidence supports its application to nursing students as a meaningful indicator of educational and professional withdrawal [6, 9]. Studies conducted in clinical workforce contexts have consistently identified workload, occupational stress, and job satisfaction as core drivers of turnover intention [10, 11]. However, these findings cannot be straightforwardly transposed to the student context,

where the mechanisms of disengagement differ fundamentally from those of employed nurses. A parallel gap exists regarding the motivational origins of professional disengagement during training. Although career motivations, including personal interest, family influence, and financial considerations have been identified as relevant to nursing students' career decisions [12, 13], and occupational risk perception during pandemic period has been shown to undermine professional commitment [7, 14], limited study has traced how these distal motivational antecedents translate into turnover intention. Taken together, these gaps underscore the need for an integrative theoretical model that simultaneously captures the motivational origins, educational stressors, and barrier mechanisms underlying turnover intention among undergraduate nursing students, evidence that is essential for designing targeted, pre-graduation retention interventions. In Vietnam, Tran et al. (2023) examined turnover intention among nursing students during the COVID-19 pandemic, identifying that academic stress, year of study, reason for choosing nursing, and preparation for nursing school were significantly associated with turnover intention [5]. However, the extent to which structural and career-related factors, including occupational risk perception, financial benefit consideration, career choice autonomy, and family influence, are independently associated with turnover intention in a post-pandemic context remains insufficiently examined.

Social Cognitive Career Theory (SCCT) offers an integrative framework for understanding how personal cognitions and contextual factors jointly shape career development that addresses interest formation, choice, and persistence [15, 16]. The theory posits that outcome expectations, together with contextual supports and barriers, shape individuals' intentions to pursue, remain in, or withdraw from a chosen profession [16]. Grounded on SCCT, the present study aims to examine how family influence, personal interest, financial benefit consideration, career choice autonomy, and occupational risk perception are jointly associated with turnover intention among undergraduate nursing students. The findings are intended to provide evidence to support educators and institutional leaders in designing targeted retention strategies.

2. MATERIALS AND METHODS

2.1. Study Area

This study was conducted at Hue University of Medicine and Pharmacy, Hue University (Hue UMP), a leading public medical institution established in 1957 in Hue City, Central Vietnam. In which, the Faculty of Nursing trains a high-quality nursing workforce to meet healthcare demands across the Central and Central Highlands regions. With over 8,500 full-time students, Hue UMP was selected as the study site given its status as one of the largest medical institutions for undergraduate nursing education in Central Vietnam, drawing a diverse student population from multiple provinces across the region.

2.2. Study Design

This study employed a cross-sectional design and was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology guidelines.

2.3. Sample size and sampling

The study was conducted at a university in Central Vietnam offering a four-year Bachelor of Nursing program, in which the first two years emphasize foundational nursing knowledge and laboratory-based skills training, while the third and fourth years focus on clinical practice. Clinical placement enables senior students to develop informed perceptions of the nursing profession, rendering them an appropriate population for examining turnover intention. Accordingly, third- and fourth-year nursing students with clinical experience were designated as the target population.

Sample size was determined using the formula for estimating a population mean:

$$n = \left(\frac{Z_{1-\frac{\alpha}{2}} \, x \, \delta}{d}\right)^2 = \left(\frac{1.96 \, x \, 2.5}{0.3}\right)^2 = 267$$

Referencing a standard deviation of σ = 2.5 derived from a comparable study utilizing the same measurement instrument [7]. Applying a 95% confidence level (Z = 1.96) and an allowable margin of error of d = 0.3 yielded a minimum required sample of 267 participants. To account for potential data loss, a 10% contingency was added to accommodate invalid responses, including incomplete questionnaires, unidirectional response patterns, or logically inconsistent answers, resulting in an adjusted target sample of 294 participants.

A census sampling strategy was employed, targeting all eligible third- and fourth-year nursing students enrolled during the first semester of the 2025 – 2026 academic year. The total eligible population comprised 320 students (third-year: n = 175; fourth-year: n = 145). Of these, 295 students

submitted responses, yielding an initial response rate of 92.2%. Following initial data screening, 15 questionnaires were excluded due to incomplete responses, unidirectional response patterns, or logically inconsistent answers. As a result, a final sample of 280 valid questionnaires was retained for data analysis (corresponding to an effective response rate of 87.5%), exceeding the minimum required sample of 267 and confirming adequate statistical power for the planned analyses.

2.4. Data Collection

Data were collected using a paper-based self-administered questionnaire distributed to students from October to November, 2025. Before data collection, researchers explained the purpose and content of the study and emphasized that participation was entirely voluntary. Data collection was conducted at a time that did not interfere with students' academic activities.

Data were collected using a self-administered questionnaire that was developed based on the study objectives and theoretical framework. The general information of students, including age, gender, ethnicity, academic year, academic performance, family economic condition, living area, and whether born in a family with a tradition of working in the healthcare profession.

Turnover Intention (TI) was assessed using a three-item Turnover Intention scale, which was developed and validated by Lin, Hu [7]. Each item was originally rated on a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). For presentation purposes, responses were collapsed into two categories: "agree/strongly agree" and "neutral/ disagree/strongly disagree." The total turnover intention score was calculated using the original five-point responses and ranged from 3 to 15, with higher scores indicating greater turnover intention. This scale has received permission to use, and the original English scales were translated and culturally adapted for use with Vietnamese nursing students following established guidelines for the translation and cultural adaptation of self-reported measures [17]. Two bilingual nursing lecturers independently translated each scale from English into Vietnamese, and the research team reviewed and synthesized the translations into a preliminary Vietnamese version. Two different bilingual nursing lecturers, who were not involved in the forward translation, then independently back-translated the Vietnamese version into English. The research team compared the back-translated versions with the original instruments and resolved any discrepancies in meaning or wording. The finalized Vietnamese versions were subsequently evaluated by an expert panel for content relevance, clarity, and cultural appropriateness. All items were rated as relevant (3 or 4) by all three experts, resulting in an I-CVI of 1.00 for all items and an S-CVI/Ave of 1.00. Internal consistency was acceptable (Cronbach's $\alpha = 0.70$).

Career Choice (CC) autonomy was assessed using the five-item Vietnamese Career Choice Autonomy Scale previously developed and validated by Giang with Cronbach's α of 0.92 [18]. Items were rated on 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). In this study, the scale demonstrated good internal consistency reliability (Cronbach's $\alpha = 0.80$).

Personal Interests (PI) was assessed by five-items Vietnamese Personal Interests Scale which developed and validated in previous study with Cronbach's $\alpha = 0.86$ [18]. The scale items were rate by 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). In this study, the scale demonstrated good internal consistency reliability (Cronbach's $\alpha = 0.82$).

Family Factors (FF) was assessed by four-items Vietnamese Family Influence Factor Scale which developed and validated in previous study with Cronbach's $\alpha = 0.82$ [18]. The scale items were rate by 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). In this study, the scale demonstrated acceptable internal consistency reliability (Cronbach's $\alpha = 0.71$).

Financial Benefit (FB) was assessed by three-items Vietnamese Financial Benefit Consideration Scale which developed and validated (Cronbach's $\alpha = 0.80$) in previous study [18]. The scale items were rate by 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). In this study, the scale demonstrated good internal consistency reliability (Cronbach's $\alpha = 0.87$).

Nursing Occupational Risk Perception (ORP) was measured using a scale developed by the authors, informed by the Occupational Risk Perception Scale proposed by Aksoy and Gürdoğan Paslı [19]. The original instrument comprised 17 items rated on 5-point Likert scale (1 = No idea perceived risk to 5 = high perceived risk). To adapt the scale to the Vietnamese nursing education and clinical practice context, a two-stage modification process was undertaken. In the first stage, two experienced nursing lecturers with expertise in occupational

health and nursing education independently reviewed all 17 items for relevance, clarity, and applicability to undergraduate nursing students in Vietnam. Items were evaluated using a four-point relevance rating scale (1 = not relevant to 4 = highly relevant), with items receiving a rating of 3 or 4 from both experts retained for inclusion. This process yielded a reduced pool of seven items most contextually appropriate for the Vietnamese nursing student population. In the second stage, content validity of the seven-item scale was independently evaluated by a separate panel of three nursing lecturers. Item-level content validity indices (I-CVI) and the scale-level content validity index (S-CVI) were computed following established procedures. All seven items achieved I-CVI = 1.00, yielding an S-CVI of 1.00, indicating excellent content validity. The revised scale was subsequently piloted with 30 nursing students, demonstrating acceptable internal consistency (Cronbach's $\alpha = 0.76$). In the main study, internal consistency was further strengthened (Cronbach's $\alpha = 0.83$), confirming the reliability of the adapted instrument.

2.5. Data Analysis

Data were analyzed using IBM SPSS Statistics version 20. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize participant characteristics and turnover intention, family influence, personal interest, financial benefit consideration, career choice autonomy, and occupational risk perception scores. The Kolmogorov–Smirnov test was employed to assess the normality of continuous variables. As the turnover intention scores did not follow a normal distribution, non-parametric tests were applied to examine group differences: the Mann–Whitney U test for two-group comparisons and the Kruskal–Wallis test for comparisons across more than two groups. Spearman's correlation analysis was performed to examine relationships between study constructs. Multiple linear regression analysis was used to identify factors associated with intention to leave the nursing profession.

Variables considered for the multivariable linear regression model were selected using a combination of theoretical relevance and statistical evidence. Variables identified a priori as important determinants of turnover intention based on the theoretical framework (Social Cognitive Career Theory) and previous literature were considered for inclusion irrespective of their significance in the bivariate analyses. Additional demographic and academic characteristics showing potential associations with turnover intention in the bivariate analyses ($p < 0.20$) were considered as candidate covariates. This approach was used to avoid excluding theoretically or clinically relevant variables solely based on unadjusted statistical significance. Multicollinearity among candidate factors was assessed before fitting the final multivariable model, and statistical significance in the adjusted model was set at $p < 0.05$.

Prior to interpreting results, standard regression assumptions were systematically assessed. Normality of residuals was assessed using P-P plots. Independence of errors was confirmed using the Durbin–Watson statistic ($d = 1.859$), indicating no autocorrelation of residuals. Multicollinearity was evaluated using tolerance values and variance inflation factors (VIF), with all tolerance values exceeding 0.10 and VIF values remaining below 2.0, confirming the absence of multicollinearity. Although turnover intention scores were non-normally distributed, multiple linear regression was considered appropriate as the normality assumption applies to model residuals rather than the outcome variable itself. Model fit was evaluated using the F-statistic, R^2, and Adjusted R^2, with statistical significance set at $p < 0.05$.

2.6. Ethical considerations

The study was approved by the Institutional Ethics Committee of Hue University of Medicine and Pharmacy, Hue University (Approval No. H2025/431, May 23, 2025). All participants were informed that participation was entirely voluntary and that refusal to participate or withdrawal from the study would have no effect on their academic standing, grades, clinical evaluations, or relationships with faculty members. No academic incentives or penalties were associated with participation. To protect confidentiality, questionnaires did not contain personally identifying information, and study findings were reported only in aggregate form. Particular caution was taken when reporting characteristics of small subgroups to minimize the risk of deductive identification. Written informed consent was obtained before participation.

3. RESULTS

Table 1. General characteristics of participants (n = 280)

Characteristics	Frequency (n)	Percentage (%)	Turnover intention (TI)	
			Mean (SD)	Rs/U/Z (p-value)
Age (years)-Mean ± SD	20.45 ± 0.69 (Min 19- Max 23)		9.57 ± 2.62	**0.157*** (0.009)**
Gender				
Woman	270	96.4	9.61 (2.56)	-0.83* (0.404)
Man	10	3.6	8.50 (4.00)	
Ethnic				
Kinh	273	97.5	10.00 (2.51)	-0.47* (0.637)
Others	7	2.5	9.56 (2.63)	
Academic year				
3rd-year student	172	61.4	9.29 (2.53)	**-2.51* (0.012)**
4th-year student	108	38.6	10.01 (2.71)	
Academic performance				
Excellent/Very good	43	15.4	10.37 (3.03)	**7.174** (0.028)**
Good	155	55.4	9.40 (2.57)	
Average and below	82	29.2	9.47 (2.45)	
Family economic condition				
Poor/nearly poor	24	8.6	10.20 (2.93)	1.401** (0.496)
Average	236	84.3	9.50 (2.56)	
Above average	20	7.1	9.60 (2.99)	
Living area				-0.153* (0.878)
Rural	132	47.1	9.50 (2.82)	
Urban	148	52.9	9.64 (2.44)	
Healthcare family tradition				
Yes	106	37.9	9.61 (2.50)	-0.074* (0.941)
No	174	62.1	9.55 (2.70)	

Mean ± SD: mean ± standard deviation; **U*: Mann–Whitney test; **Z: Kruskal–Wallis test;*** Rs: Spearman.

A total of 280 nursing students participated in the study, with a mean age of 20.45 years (SD = 0.69; range: 19 – 23 years). The majority of participants were female (96.4%) and of Kinh ethnicity (97.5%). Most participants were in their third academic year (61.4%), while the remaining were in their fourth year (38.6%). More than half of the students reported good academic performance (55.4%). Most participants reported an average family economic condition (84.3%) and resided in urban areas (52.9%). In addition, 37.9% of students reported having a healthcare family tradition.

Turnover intention was significantly associated with age (Rs = 0.157, p = 0.009), academic year (U = -2.51, p = 0.012), and academic performance (Z = 7.174, p = 0.028). Specifically, fourth-year students reported higher turnover intention scores than third-year students (10.01 vs. 9.29), while students with excellent or very good academic performance reported the highest turnover intention scores (10.37 ± 3.03). No significant differences in turnover intention were observed according to gender, ethnicity, family economic condition, living area, or healthcare family tradition (all p > 0.05).

Table 2. Responses to the turnover intention of the participants (n = 280)

Items	Strongly agree/Agree (n (%))	Strongly disagree/ Disagree/Neutral (n (%))
I often think of not going into the nursing profession in the future	113 (40.4)	167 (59.6)
It is very possible that I will look for a career in the healthcare industry that has zero contact with patients in the future	145 (51.8)	135 (48.2)
If I could choose again, I would choose not to be in the nursing course	145 (51.8)	135 (48.2)
Total Mean (SD)	**9.57 (2.62)** (Min 3- Max 15)	

The mean turnover intention score among nursing students was 9.57 ± 2.62 (range: 3 – 15). Overall, 40.4% of participants reported frequently thinking about leaving the nursing profession, while 51.8% preferred a healthcare career with no direct patient contact and indicated that they would not choose nursing again if given another opportunity. These findings indicate a substantial level of turnover intention among the study participants.

Table 3. Career choice autonomy, family influence in career choice, personal interests, financial benefit consideration, and occupational risk perception among nursing students (n = 280)

Sacles/Items	Actual range	Mean+SD
Career choice autonomy	**2 - 5**	4.08 ± 0.52
I have total freedom to choose my career	1 - 5	4.00 ± 0.81
I carefully consider career choices before taking a job	1 - 5	3.91 ± 0.71
In my opinion, career choice is one of the most important decisions	2 - 5	4.17 ± 0.65
In my opinion, career choice influence enormously my personal growth	2 - 5	4.19 ± 0.68
It is a must for me to fully understand the job before choosing it	2 – 5	4.15 ± 0.66
Family factors in career choice	**1 - 5**	3.09 ± 0.74
My family expect that my choice of occupation will reflect their wishes	1 - 5	2.99 ± 1.03
My family discussed career issues with me at an early age	1 - 5	2.71 ± 1.14
My family showed me how to be successful in choosing a career	1 - 5	3.20 ± 0.96
My family provided guidance on which careers would be best for me	1 - 5	3.49 ± 0.94
Financial benefit consideration	**1 - 5**	4.14 ± 0.68
Salary and bounces have the most significant influence in choosing my career path	1 - 5	4.14 ± 0.76
It is important for me to get a high salary job after graduation	1 - 5	4.18 ± 0.77
I consider financial benefits are the most significant motivator of career choice.	1 - 5	4.10 ± 0.78
Personal interests in career choice	**2 - 5**	3.98 ± 0.51
I would do better in the field that interests me	2 - 5	3.99 ± 0.60
I would choose careers that match my interests.	2 - 5	3.91 ± 0.71
I would get greater satisfaction and happiness when working in the fields of interests	2 - 5	4.12 ± 0.65
In my ideal job, it is important that I would make use of my interests	2 - 5	4.03 ± 0.70
I constantly looking for what make me happy in career choice	2 - 5	3.90 ± 0.74

Occupational risk perception in nursing	**1.71 - 5**	**4.03 ± 0.51**
Risks of excessive workload related to shortages of nurses.	1 - 5	3.96 ± 0.76
Risk of circadian rhythm disruption due to long working hours, night shifts, or shift work.	2 - 5	4.14 ± 0.64
Risk of occupational diseases and infectious diseases due to the nature of the nursing profession and work environment.	2 - 5	4.27 ± 0.63
Risk of mental health impact related to pressure from multiple sources (managers, patients, patients' families) and the high-pressure nature of the nursing profession.	2 - 5	4.21 ± 0.63
Risk of abuse (physical abuse, verbal abuse, etc.) from patients and their families.	1 - 5	3.78 ± 0.85
Risk of insufficient rest time (such as lunch breaks, breaks between shifts) due to the nature of patient care work.	1 - 5	4.04 ± 0.74
Risk of impact on work-life balance due to irregular working hours and rotating shifts in nursing.	1 - 5	3.81 ± 0.81

Table 3 summarizes the descriptive statistics of the study constructs. Financial benefit consideration had the highest mean score (4.14 ± 0.68), followed by career choice autonomy (4.08 ± 0.52), occupational risk perception (4.03 ± 0.51), personal interests in career choice (3.98 ± 0.51), and family factors in career choice (3.09 ± 0.74). Overall, participants reported high levels of career choice autonomy and financial benefit consideration. Within the occupational risk perception dimension, the perceived risks of infectious and occupational diseases (4.27 ± 0.63) and mental health impacts related to work pressure (4.21 ± 0.63) received the highest ratings, whereas the risk of abuse from patients and their family members received the lowest rating (3.78 ± 0.85).

Table 4. Correlation between study constructs

Variables	TI	PI	FB	CC	FF	ORP
Turnover intention	**1**					
Personal interests	0.055	**1**				
Financial benefit	**0.183****	**0.395****	**1**			
Career choice autonomy	-0.021	**0.499****	**0.540****	**1**		
Family influence	-0.073	**0.193****	0.037	0.068	**1**	
Occupational risk perception	**0.219****	**0.177****	**0.452****	**0.373****	-0.040	**1**

r_s: Spearman's ρ

* Correlation is significant at the level of 0.05.

** Correlation is significant at the level of 0.01.

TI: turnover intention; PI: personal interests; FB: financial benefit consideration; CC: career choice autonomy; FF: family influence; ORP: occupational risk perception.

Spearman's correlation analysis was conducted to examine the relationships among the study constructs (Table 4). Turnover intention was significantly and positively correlated with financial benefit consideration ($r_s = 0.183$, $p < 0.01$) and occupational risk perception ($r_s = 0.219$, $p < 0.01$), indicating that students with greater concerns about financial rewards and occupational risks tended to report higher turnover intention.

Among the predictor variables, several significant intercorrelations were observed. Personal interests were positively correlated with financial benefit perceptions ($r_s = 0.395$, $p < 0.01$), career choice autonomy ($r_s = 0.499$, $p < 0.01$), family influence ($r_s = 0.193$, $p < 0.01$), and occupational risk perception ($r_s = 0.177$, $p < 0.01$). Financial benefit perceptions were significantly correlated with career choice autonomy ($r_s = 0.54$, $p < 0.01$) and occupational risk perception ($r_s = 0.452$, $p < 0.01$). Career choice autonomy was also positively associated with occupational risk perception ($r_s = 0.373$, $p < 0.01$).

Table 5. Multiple linear regression with turnover intention as outcome (n = 280)

Outcome variable	B	SE	B	*p* – value	F/R^2 (Adjusted R^2)	p	Multicollinearity	
							Tolerance	VIF
Financial benefit	0.711	0.262	0.185	**0.007**	F=8.286 R^2 =0.131 (0.115)	< 0.001	0.685	1.461
Career choice autonomy	-1.127	0.330	-0.225	**0.001**			0.726	1.378
Family influence	-0.398	0.200	-0.113	**0.048**			0.982	1.019
Occupational risk perception	1.208	0.314	0.236	**< 0.001**			0.837	1.194
Age	0.362	0.217	0.095	0.097			0.969	1.032

Multiple linear regression analysis was conducted to identify independent factors associated with turnover intention among nursing students (Table 5). The final model was statistically significant (F = 8.286, p < 0.001) and accounted for 13.1% of the variance in turnover intention (Adjusted R^2 = 0.115). While statistically significant, this relatively modest proportion of explained variance suggests that turnover intention is a multidimensional phenomenon influenced by a broad range of factors beyond those examined in the present study.

Multicollinearity diagnostics confirmed the absence of collinearity issues, with all tolerance values exceeding 0.10 and VIF values remaining below 2.0. Four variables emerged as statistically significant associated factors of turnover intention. Financial benefit perceptions (β = 0.185, p = 0.007) were positively associated with turnover intention, indicating that students who prioritized financial incentives as primary career motivators were more likely to report intentions to leave the nursing profession. Occupational risk perception (β = 0.236, p < 0.001) was similarly positively associated with turnover intention, suggesting that heightened concerns about occupational risks in nursing were associated with greater turnover intention. Conversely, career choice autonomy (β = −0.225, p = 0.001) and family influence (β = −0.113, p = 0.048) were each negatively associated with turnover intention, demonstrating that students who exercised greater autonomy in their career decision-making and received stronger family support for pursuing nursing reported significantly lower intentions to leave the profession. Age was included as a covariate but did not reach statistical significance (β = 0.095, p = 0.097) and was therefore not interpreted as a substantive predictor in the final model.

4. DISCUSSION

Nursing turnover intention among students is increasingly recognized as an early warning indicator of future workforce attrition, with implications that extend beyond individual career decisions to threaten the stability of healthcare systems globally [2]. In this study, the mean turnover intention score among nursing students at Hue University of Medicine and Pharmacy was 9.57 (SD = 2.62) on a scale of 3 to 15, reflecting a moderate but concerning level of professional disengagement. This figure is slightly higher than the 9.19 (SD = 2.49) reported by Tran et al. (2023) among nursing students in Central Vietnam during the COVID-19 pandemic [5], the 9.2 (SD = 2.5) was reported by Lin et al. (2021) among Chinese nursing students amid acute pandemic conditions [7]. Notably, a Korean study among third- and fourth-year Generation Z nursing students found that only 17.6% expressed turnover intention within two years of employment, a strikingly lower proportion compared to the present Vietnamese context, suggesting that national healthcare systems, professional compensation structures, and cultural expectations shape the magnitude of this problem in distinct ways [4].

At the item level, the proportions observed were substantially elevated compared to both Vietnamese and international benchmarks. While Tran et al. (2023) reported that 31.1% thought of not going into nursing, 32.5% sought patient-free healthcare careers, and 32.2% would not study nursing again [5], the corresponding figures in this study were 40.4%, 51.8%, and 51.8%, respectively. However, these differences should be interpreted cautiously because the studies were conducted at different time points and may differ in participant characteristics and contextual conditions. Therefore, the present

findings should not be interpreted as evidence of increasing professional disengagement over time. Rather, they indicate that intention to leave the nursing profession remains an important concern among nursing students and warrants further investigation of the educational, occupational, and psychosocial factors that may contribute to this intention. A scoping review highlighted that attrition from nursing is increasingly driven not by academic failure alone, but by students' rational recalibration of career prospects in light of growing professional alternatives [6]. Globally, nursing graduates are increasingly pursuing roles in health education, pharmaceutical industries, aesthetic healthcare, medical device sectors, and international employment, options that offer better remuneration and improved work-life balance [11]. This structural pull is particularly relevant in Vietnam, where tuition fees for nursing programs are high, but graduates face low salaries and limited incentive schemes, creating a visible cost-benefit imbalance that deepens as students progress through clinical training [20].

Regarding demographic characteristics, age, year of study, and academic performance were significantly associated with turnover intention. Older students showed higher turnover intention (r = 0.157, $p = 0.009$), and fourth-year students reported significantly higher turnover intention than third-year students (10.01 vs. 9.29, $p = 0.012$), consistent with evidence that professional disengagement tends to deepen as students accumulate clinical experience and become more aware of nursing's structural challenges, including heavy workloads, low salaries, and limited career incentives [21]. Notably, students with excellent or very good academic performance reported the highest turnover intention scores (mean = 10.37) compared to those with average or below-average performance (mean = 9.47, $p = 0.028$). This counterintuitive finding may reflect the broader career opportunities available to high-achieving nursing students, such as academic lecturer positions, research roles, and pharmaceutical or international employment pathways, which offer more attractive remuneration and working conditions relative to clinical nursing [6, 11].

Although academic achievement is generally considered an indicator of successful progression in nursing education, this finding suggests that academic success does not necessarily translate into stronger commitment to the nursing profession. One possible explanation is that high-achieving students may have higher career expectations and perceive a wider range of alternative educational or occupational opportunities. Previous qualitative evidence has shown that academically high-achieving students may perceive nursing as offering insufficient opportunities to fully utilize their academic potential and may be discouraged by its perceived professional status [22]. Furthermore, satisfaction with future career opportunities has been associated with nursing students' career intentions, suggesting that perceptions of limited advancement or professional development may encourage students to reconsider their future within nursing [23]. Thus, retaining academically strong students may require not only academic support but also clearer career-development pathways, professional recognition, and opportunities for specialization, leadership, and advanced practice.

Nursing attrition is increasingly driven by profession mismatch and unmet expectations, particularly among students with stronger academic capabilities who perceive viable alternatives, suggesting that retaining top-performing students requires targeted career development strategies that enhance the perceived value and prestige of clinical nursing as a long-term profession [24].

Multiple linear regression confirmed four independent associated factors, collectively explaining 13.1% of the variance in turnover intention (Adjusted $R^2 = 0.115$, $p < 0.001$), suggesting that turnover intention is a multidimensional phenomenon influenced by factors beyond those examined in this study. This relatively modest explanatory power further emphasizes the multidimensional nature of students' decisions about whether to remain in the nursing profession. Beyond financial considerations, career choice autonomy, family influence, and occupational risk perception, other individual, educational, and workplace-related factors may also play important roles. In particular, psychological distress and emotional exhaustion, negative experiences during clinical placements, inadequate supervision and support, and exposure to understaffing and excessive workloads may adversely shape students' perceptions of future nursing work and their willingness to enter or remain in clinical practice [25, 26]. Recent evidence also suggests that professional identity, professional self-image, perceived workplace resources, and the social recognition of nursing are closely related to nursing students' career intentions [27]. Moreover, students may reconsider nursing when they perceive limited opportunities for career advancement, professional

development, or alternative career pathways with more favorable working conditions and rewards [6, 11]. Therefore, the unexplained variance observed in the present model likely reflects a broader range of psychological, clinical-learning, professional, and structural influences that were not captured by the variables assessed. Future studies should incorporate these factors and consider longitudinal or more comprehensive theoretical models to better explain how nursing students' turnover intentions develop over time.

Occupational risk perception was the strongest independent factor associated with turnover intention ($\beta = 0.236$, $p < 0.001$), indicating that students who perceived nursing as a high-risk occupation were more likely to intend to leave. This finding is consistent with Li et al. (2023), who demonstrated that higher risk perception among nursing students during clinical training induced stress that led to behaviors of estrangement and escape from the profession [28]. Nursing education programs should include structured risk literacy early (infection prevention, workplace safety, violence prevention, and coping resources), delivered in ways that are transparent yet efficacy-building. Related evidence shows that heightened risk-related perceptions among nursing students can affect professional commitment and related outcomes, indicating the importance of addressing risk appraisals alongside clinical preparation [28]. Therefore, retention-focused educational investment, including resourcing student support services and ensuring safe clinical learning environments to mitigate academic and risk-related factors, is necessary. These findings suggest that nursing education programs may benefit from incorporating structured risk literacy content, including infection prevention, workplace safety, and coping resources, delivered in ways that are transparent yet efficacy-building, alongside ensuring safe clinical learning environments.

Financial benefit was also significantly positively associated with turnover intention ($\beta = 0.185$, $p = 0.007$), meaning students who placed greater importance on financial rewards showed higher turnover intention, a finding reflecting the well-documented gap between nursing's workload demands and its financial returns in Vietnam [5, 29]. Globally, effort-reward imbalance is among the most consistently reported job-related correlates of turnover intention across multiple countries, and this dynamic appears to manifest even at the student stage in the Vietnamese context, where low graduate salaries are widely known before entering the workforce [13]. Nurse educators may support students by providing realistic information regarding income trajectories, career advancement pathways, and specialization opportunities associated with enhanced earning potential, helping students integrate financial expectations with a sustainable professional identity. At the policy level, scholarships, competitive salary structures, and strengthened post-graduation employment opportunities may help foster more positive outcome expectations toward the profession.

Career choice autonomy emerged as a significant negative factor associated with turnover intention ($\beta = -0.225$, $p = 0.001$), suggesting that students who perceived greater freedom in choosing nursing tended to report lower turnover intention. This underscores the critical role of self-determined career entry in sustaining professional commitment, as supported by Social Cognitive Career Theory, which posits that autonomous career decisions foster stronger outcome expectations and professional identity [15, 16]. Additionally, Tran HTT (2023) found significantly different turnover intention levels among students who chose nursing based on personal interest rather than external influence [5]. In collectivist Asian societies, including Vietnam, career decisions are heavily shaped by family expectations rather than individual interest, and students who enter nursing without genuine personal motivation remain vulnerable to disengagement when clinical realities prove challenging [13]. Educators should build autonomy-supportive learning environments through mentorship, supportive communication, and career identity development. Targeted intervention, including pre-admission and early-program career guidance, should be employed to buffer students' intrinsic interest in the nursing profession.

Family influence was negatively associated with turnover intention ($\beta = -0.113$, $p = 0.048$). In the present study, family influence primarily reflected family expectations, career-related discussions, and guidance in career decision-making. Previous studies have similarly shown that parental influence and authority can play an important role in nursing students' career choices, particularly in contexts where students rely on family advice and expectations when making career decisions [30, 31]. Family support for a nursing career has also been associated with greater willingness to pursue nursing education and stronger career-related engagement [31]. Thus, greater family involvement and guidance

may help reinforce students' commitment to their chosen career. However, because the current scale includes both family expectations and career guidance, the findings cannot distinguish supportive involvement from controlling parental influence. Future studies should assess these dimensions separately to clarify how different forms of family influence relate to nursing students' intentions to remain in the profession.

In conclusion, these findings highlight that turnover intention among Vietnamese nursing students is shaped by an interplay of perceived risk, financial expectations, and the degree to which career entry was experienced as personally meaningful and socially supported.

Limitations

This study has several limitations worth noting. The cross-sectional design prevents causal inference, and longitudinal studies are needed to track how turnover intention evolves as students enter the workforce. As the study was conducted at a single university in Central Vietnam, findings may not be generalizable to nursing students at other institutions across the country. Self-administered questionnaires introduce the possibility of social desirability bias, potentially leading to underreporting of true turnover intentions. Additionally, restricting the sample to third- and fourth-year students, while theoretically justified, limits insight into earlier-year students' professional perspectives. Finally, the regression model explained only 13.1% of the variance in turnover intention (Adjusted $R^2 = 0.115$), indicating that a substantial proportion of variance remains attributable to unmeasured factors. Future studies should explore additional variables such as professional identity, burnout, mentorship quality, peer influence, organizational support, and mental health status, which were not captured in the present study but may contribute meaningfully to nursing students' turnover intention.

5. CONCLUSION

This study found a moderate but concerning level of turnover intention among third- and fourth-year nursing students at Hue University of Medicine and Pharmacy, with more than half indicating that they would not choose nursing again and expressing a preference for healthcare careers without direct patient contact. Occupational risk perception and financial benefit consideration were positively associated with turnover intention, whereas career choice autonomy and family influence were negatively associated with turnover intention in the multivariable analysis. In addition, age, academic year, and academic performance were significantly associated with turnover intention in bivariate analyses.

These findings suggest that nursing students' intention to leave the profession is associated with multiple career-related and contextual factors. Nursing education programs may therefore consider strengthening career guidance, supporting informed and autonomous career decision-making, and addressing students' concerns regarding occupational risks and future career conditions. Further longitudinal and multicenter studies are needed to examine additional factors influencing nursing students' career intentions.

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Ethics approval and consent to participate

All participants were fully informed about the purpose, objectives, and procedures of the study and were invited to participate voluntarily. Prior to data collection, informed consent was obtained from each participant. Confidentiality and anonymity were strictly maintained, and all data collected were used solely for research purposes. This study was approved by the Institutional Ethics Committee of Hue University Medicine and Pharmacy, Hue University (Approval No. H2025/431, dated May 23, 2025).

Competing interests

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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Data Availability Statement

The data used in this study are part of a larger dataset collected for a broader research project on career intentions among nursing students in Central Vietnam. Data are available from the corresponding author upon reasonable request.

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