A Study on the Preferences of Undergraduate Nursing Students for Clinical Teaching: Based on Discrete Selection Experiments

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Abstract: *Objective:* To investigate the preference characteristics and relative importance of each core factor in the teaching program for undergraduate nursing students during clinical practice, and to provide empirical support for the creation of a student-centered, formalized clinical teaching system that meets the actual needs of nursing students. *Methods:* The quantitative research method of discrete choice experiment was adopted, and the questionnaire was designed based on the random utility theory. Through a systematic literature review, semi-structured interviews, and two rounds of Delphi expert consultations, six core attributes of the instructor, namely educational qualifications, teaching methods, frequency of individualized guidance, operational practice opportunities, feedback timeliness, and instructor title, and their corresponding levels were determined. The study period was from January 2024 to January 2025, and 158 undergraduate nursing students who chose to intern at Deyang People's Hospital were selected as the research subjects. A survey tool with 12 choice sets was created using Ngene software, and then statistical analysis was performed on the obtained data using the conditional Logit model to measure the impact of each attribute on the choice behavior of nursing students. *Results:* The results showed that the conditional Logit model fitted well (likelihood ratio chi-square = 85.32, $p < 0.001$). The analysis results indicated that the most important teaching attributes for undergraduate nursing students were, in order: the academic qualifications of the teaching instructor (master vs. Junior college, $\beta = 0.42$, $p < 0.01$), individualized guidance frequency (daily vs. Weekly, $\beta = 0.38$, $p < 0.01$), operational practice opportunities (more vs. less, $\beta = 0.31$, $p < 0.05$), and the timeliness of feedback (timely versus delayed, $\beta = 0.29$, $p < 0.05$). The influence of the title of the instructor was not statistically significant ($p > 0.05$). *Conclusion:* Undergraduate nursing students show a clear and systematic preference structure for clinical teaching, with a high expectation of frequent personalized guidance from highly educated teachers, as well as sufficient operational opportunities and timely teaching feedback.

Keywords: Undergraduate nursing students; Clinical teaching; Preference; Discrete selection experiments; Nursing education

1. Introduction

Clinical practice is an important part of nursing education and is tasked with transforming theoretical knowledge of nursing into practical skills. Undergraduate nursing students are a critical period for skill formation, as well as for the construction of professional identity and the cultivation of professional values. With the development of the nursing profession in China, the total number of nurses has exceeded 5 million. The National Nursing Development Plan (2021–2025) also proposes to improve the quality of nursing training, with a focus on improving the quality of nursing training [1]. However, there is still a disconnection between theory and practice in nursing education. Nursing students often have fewer practical opportunities, inconsistent teaching quality, and frustrated learning initiative during clinical internships, all of which affect the cultivation of core competencies of nursing students.

In the process of clinical teaching, the qualifications of the teaching staff, the teaching methods and the guidance strategies play a decisive role. Traditional studies have mostly focused on teaching models from the perspective of teachers, with little consideration given to the real needs and preferences of nursing students [2]. Understanding the characteristics of clinical teaching preferences of nursing students can construct student-centered teaching models. The discrete choice experiment method originated in economics and has been widely applied in the medical and health field in recent years. Simulating real decision-making scenarios to quantify individual preferences can reveal the relative importance of each attribute in decision-making.

In the field of nursing education, discrete choice experiments have been used in studies such as nurses' job choices and patients' medical decisions, but their application to the clinical teaching preferences of undergraduate nursing students is relatively rare. Undergraduate nursing students are at a critical stage of their career development, and their teaching preferences have unique phased characteristics [3]. Exploring the preference structure of undergraduate nursing students for clinical teaching can provide empirical evidence for institutions to formulate scientific and reasonable teaching programs, thereby improving the quality of clinical teaching and the satisfaction of nursing students. A discrete selection experiment was used to quantitatively analyze the preferences of undergraduate nursing students for various attributes of clinical teaching, thereby providing a basis for improving the teaching model.

2. Data and methods

2.1. General information

A cross-sectional survey design was adopted, with undergraduate nursing students doing internships at Deyang People's Hospital from January 2024 to January 2025 as the research subjects. A convenient sampling method was used to recruit 165 eligible nursing students. Finally, 158 valid questionnaires were obtained, with an effective recovery rate of 95.8%.

The sample size was calculated using the thumb rule for discrete selection experiments. Based on the number of attribute levels obtained from the pre-experiment ($c = 3$), the number of selection sets for each version of the questionnaire ($t = 12$), and the number of options for each selection set ($a = 2$), at least 63 samples are required for each version of the questionnaire. Given that two types of questionnaires were used for allocation in this study, a 20% invalid questionnaire ratio was reserved, the final minimum sample size was determined to be 158 people.

There were 12 males (7.6%) and 146 females (92.4%) in the study, and the gender ratio was in line with the actual distribution of the nursing profession. The age ranged from 19 to 23 years, with an average age of (21.4 ± 1.2 years). All nursing students are from full-time undergraduate nursing institutions, including partner institutions

such as Southwest Medical University, Chengdu University of Traditional Chinese Medicine, and North Sichuan Medical College. All the nursing students in the internship arrangement have completed more than eight months of clinical rotations, including major clinical departments such as internal medicine, surgery, obstetrics and gynecology, and pediatrics.

2.2. Methods

This study used discrete choice experiments, a quantitative research method, to explore the preference structure of nursing students by simulating clinical teaching scenarios. The main steps of the research method are as follows:

Through systematic literature review, semi-structured interviews, and two rounds of Delphi expert consultations, six core teaching attributes and the levels of each attribute were determined.

Generate the selection set using efficient fractional factor design. Experiment with Ngene1.2 software to ensure that the selection set is orthogonal and balanced. A total of 12 selection sets were obtained and randomly divided into two questionnaires, each containing 6 selection sets. Each selection set had two mentoring options and one "no choice" to simulate a real decision-making environment and prevent bias caused by forced selection.

When the questionnaire was implemented, uniformly trained investigators explained the purpose of the study and the filling requirements to the nursing students. Before the formal start, sample questions are provided to ensure that participants understand the selection task. It takes about 15 to 20 minutes to complete the questionnaire, and all questionnaires are filled out and collected on the spot.

2.3. Observation indicators

The primary indicator of this study was the degree of preference of nursing students for various aspects of clinical teaching, quantified by the regression coefficients (β values) of each attribute in the conditional Logit model. A positive regression coefficient indicates a positive direction of preference, meaning the larger the coefficient, the stronger the preference. At the same time, calculate the relative importance of each attribute, that is, the proportion of that attribute in the decision-making of nursing students.

Secondary observation indicators include demographic characteristics of nursing students, such as gender, age, and school, to analyze differences in preferences among different groups. Quality indicators of questionnaire completion, such as completion time and option consistency, were also recorded to ensure the reliability of the data.

2.4. Statistical processing

Data entry was performed using EpiData 3.1, and conditional Logit model analysis was conducted using Stata 17.0. A difference was considered statistically significant when $p < 0.05$ [4].

3. Results

3.1. Basic characteristics of the research subjects

A total of 158 undergraduate nursing students were included in this study, and their basic information is shown in **Table 1**. The majority of the students were female, with an average age of 21.4 ± 1.2 years, ranging from 19 to 23 years. In terms of the distribution of institutions, Southwest Medical University had the largest number of students, accounting for 39.2%, followed by Chengdu University of Traditional Chinese Medicine, accounting for 30.4%, and then North Sichuan Medical College, accounting for 24.1%. All the nursing students completed a clinical rotation of no less than eight months.

Table 1. Distribution of basic characteristics of the study subjects (n = 158)

Characteristics	Classification	Number of people (n)	Composition ratio (%)
Gender	male	12	7.6
	female	146	92.4
Age (years)	≤ 20	45	28.5
	21–22	78	49.4
	≥ 23	35	22.1
Institution of Study	Southwest Medical University	62	39.2
	Chengdu University of Traditional Chinese Medicine	48	30.4
	North Sichuan Medical College	38	24.1
	Other institutions	10	6.3

3.2. Analysis of clinical teaching preferences for undergraduate nursing students

The results of the preference analysis based on the conditional Logit model are presented in **Table 2**. The regression coefficients of the other five attributes, except for the title of the instructor, were statistically significant ($p < 0.05$), indicating that these factors had a significant impact on the choice preferences of undergraduate nursing students.

Table 2. Results of the conditional Logit model analysis of clinical teaching preferences for undergraduate nursing students

Attributes	Level	β value	SE	p-value	Attributes
Teaching qualifications	Associate degree (see)	-	-	-	Teaching qualifications
	Undergraduate	0.18	0.09	0.08	
	Master's	0.42	0.11	< 0.01	
Teaching methods	On-the-job learning (see)	-	-	-	Teaching methods
	Group teaching	0.11	0.08	0.21	
	One-on-one	0.25	0.13	0.06	
Personalized guidance frequency	Once a week (reference)	-	-	-	Personalized guidance frequency
	2–3 times a week	0.22	0.10	< 0.05	
	Every day	0.38	0.09	< 0.01	
Hands-on practice opportunities	Less (for reference	-	-	-	Hands-on practice opportunities
	General	0.15	0.07	0.09	
	more	0.31	0.12	< 0.05	
Feedback timeliness	Delay (see)	-	-	-	Feedback timeliness
	General	0.13	0.08	0.15	
	Timely	0.29	0.10	< 0.05	
Teaching teacher title	Nurse (reference)	-	-	-	Teaching teacher title
	Nurse	0.09	0.06	0.32	
	Head Nurse	0.20	0.11	0.07	

Note: Model likelihood chi-square = 85.32, $p < 0.001$

From the regression coefficients of each attribute, the educational attainment of the instructor had the greatest impact on the preference of nursing students ($\beta = 0.42$, $p < 0.01$), and nursing students were significantly more inclined to choose the frequency of individualized guidance by instructors with a master's degree ($\beta = 0.38$, $p < 0.01$), operational practice opportunities ($\beta = 0.31$), The second and third most important factors, $p < 0.05$, are that nursing students hope to receive personalized guidance every day and have more practical operation opportunities.

Feedback timeliness ($\beta = 0.29$, $p < 0.05$) also showed a significant impact, as nursing students hoped that their instructors could provide feedback in a timely manner. In terms of teaching methods, nursing students showed a tendency to prefer one-on-one teaching, but the significance level was at the critical value ($\beta = 0.25$, $p = 0.06$).

4. Discussion

This study uses discrete selection experiments to reveal the preference characteristics of undergraduate nursing students for clinical teaching, providing data support for the improvement of clinical teaching. It can be seen from the findings that nursing students have preferences for the academic qualifications of their instructors, individualized guidance, practical opportunities, and timely feedback, which can provide specific directions for the development of teaching work [5].

The academic qualifications of the instructors ($\beta = 0.42$, $p < 0.01$) are the attributes that nursing students value most. Nursing students' preference for instructors with a master's degree or higher reflects their desire for high-level theoretical knowledge guidance and research capabilities. Highly educated teachers can provide nursing students with a more systematic knowledge system and a cutting-edge academic perspective, helping them develop the concept of evidence-based nursing. This result is the same as the conclusion of the Master of Professional degree in nursing research, indicating that medical institutions should take academic qualifications into account when selecting teaching staff and create a variety of teaching teams.

The frequency of individualized instruction ($\beta = 0.38$, $p < 0.01$) was the second favorite of nursing students. Nursing students clearly prefer daily guidance to 2–3 times a week or once a week, indicating that the frequency of personalized guidance is very important for learning outcomes [6]. Due to the high pressure of clinical work, it is difficult for teaching staff to provide sufficient personalized guidance. It is recommended that medical institutions reasonably adjust the workload of teachers to ensure the implementation of personalized guidance.

The operational practice opportunities ($\beta = 0.31$, $p < 0.05$) reflect the demand of nursing students for more operational practice opportunities, which is contrary to the current phenomenon of "seeing more and doing less" in most medical institutions. More operations are the most frequently chosen option by nursing students, twice as many as general operations, indicating that operational practice for nursing students should be increased through simulation training, phased authorization, etc.

Feedback timeliness ($\beta = 0.29$, $p < 0.05$) is the fourth factor, that is, the degree of importance nursing students attach to timely feedback. Timely feedback can correct mistakes, consolidate skills, and boost confidence in learning. Research has found that nursing students value the timeliness of feedback more than the frequency of feedback. It is recommended that instructors provide feedback promptly to improve the quality of teaching.

5. Conclusion

The practical significance of this study lies in pointing out the direction for the reform of clinical teaching, which

should establish teaching teams mainly composed of highly educated teachers and supplemented by teachers of all levels; Standardized individualized guidance plans should be developed to ensure the frequency and quality of guidance; A complete practical training system should be established to ensure the operation time of nursing students; An effective feedback mechanism should be established to achieve mutual learning between teaching and learning. The quality of clinical teaching has improved, and the professional identity and career confidence of nursing students have been enhanced.

Funding

Disclosure statement

The authors declare no conflict of interest.

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