

An Investigation into the Current Status and Determinants of Learning Engagement among Undergraduate Nursing Students: A Cross-Sectional Study

Qingsong Zhang^{1,2,3}, Shuxian Wang^{1,2,3*}, Yijuan Li^{1,2,3*}, Huiying Yang^{2,3,4}, Yiwen Hou^{2,3,4}

¹Outpatient Department, Affiliated Hospital of Youjiang Medical University for Nationalities, Baise, China

²Clinical Medical University of Youjiang Medical University for Nationalities, Baise, China

³Life Science and Clinical Medicine Research Center, Baise, China

⁴Youjiang Medical University for Nationalities, Baise, China

Email: Zhangqingsong2025@163.com, *Shuxian Wang2025@163.com, *Liyijuan2025@163.com

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Abstract

Objective: To investigate the current status of learning engagement among undergraduate nursing students and its related influencing factors, and to provide a basis for improving the quality of nursing education. **Methods:** 1) This study was designed as a cross-sectional study and used the convenience sampling method. A general information questionnaire and learning engagement behavior scale were used to investigate 240 undergraduate nursing students at Youjiang Medical University for Nationalities. 2) Data were processed using SPSS 26.0, and the status of learning engagement was described by frequency and percentage. Independent sample t-test was used for comparisons between two *groups*, one-way analysis of variance was used for comparisons between multiple groups, and multiple linear regression analysis was used for influencing factors. A P value < 0.05 was considered statistically significant. **Results:** The total score of **learning engagement** for undergraduate nursing students was (81.15 ± 18.39) , which was at a medium level. Multiple linear regression analysis showed that reasons for studying nursing, class ranking, and participation in research projects were independent influencing factors ($R^2 = 0.173$, adjusted $R = 0.121$, $F = 3.357$, $P < 0.001$). **Conclusion:** 1) This survey shows that the learning engagement of undergraduate nursing students is at a **medium level** and still needs to be improved. 2) Multiple linear regression analysis indicated that reasons for enrolling in nursing, class ranking, and participation in research projects were independent influencing factors of learning engagement. 3) Specifi-

*Corresponding author.

cally, those who chose nursing because of “good benefits” had higher learning engagement; The higher the academic ranking in the class, the higher the academic commitment; Those who did not participate in research projects had higher learning engagement than those who led projects.

Keywords

Undergraduate Nursing Students, Learning Engagement, Status Quo of Behavior, Influencing Factors, Boosting Strategies

1. Introduction

China is at a critical stage in the implementation of the “Healthy China 2030” strategy. In 2024, the “Guiding Opinions on Strengthening the Nursing Workforce and Optimizing Nursing Services” jointly issued by multiple departments including the National Health Commission of China explicitly stated that the size of the nursing workforce should be expanded and professional capabilities improved to meet the increasingly diverse and differentiated health needs of the people. At the same time, with the accelerating pace of aging and the rising demand for chronic disease care, the contradiction of insufficient supply of professional nursing talents has become increasingly prominent, and it is urgent to accelerate the cultivation of high-level nursing talents.

Learning engagement, as a key indicator for evaluating the quality of higher education and predicting academic outcomes, mainly includes three dimensions (Schaufeli et al., 2002): vitality, dedication and concentration, which can objectively reflect the daily learning state and psychological engagement level of undergraduate nursing students. Research shows that higher learning engagement can not only effectively improve students’ academic performance and critical thinking ability (Wu et al., 2021), but also reduce learning burnout, enhance professional identity, and thereby affect future clinical work performance and physical and mental health (Yang et al., 2024). In the field of nursing education, learning engagement is regarded as an important factor in ensuring teaching quality and promoting the professional growth of nursing students, and it is also an indispensable important link (Wang et al., 2023, Zhou et al., 2025) in stabilizing the teaching quality of higher education. Therefore, it is of great practical significance to systematically understand the current situation of learning engagement among nursing students and its key influencing factors.

There are still certain limitations in current domestic research on learning engagement for undergraduate nursing students, mainly reflected in the fact that studies mostly focus on a single variable and lack multi-dimensional and systematic analysis; At the same time, most of the existing research is limited to specific regions or schools, and it is difficult to fully reflect the overall situation of the country.

In response to these shortcomings, this study selected undergraduate nursing

students at Youjiang Medical University for Nationalities as the research sample, used the cross-sectional survey method, and combined with the learning engagement scale and demographic data for data analysis. The aim was to explore whether there were differences in learning engagement among variables such as gender, grade, major direction, and academic performance, and to identify the underlying mechanisms. The realization of the above research objectives can provide targeted teaching suggestions for nursing educators and scientific basis for school administrators to optimize talent cultivation programs.

2. Data and Methods

2.1. Research Subjects

Subjects of Study

This study was designed as a cross-sectional study and was conducted using the convenience sampling method. A total of 240 full-time undergraduate nursing students at Youjiang Medical University for Nationalities between November 2025 and May 2026 were selected as the subjects. The study was conducted in accordance with the ethical standards described in the Helctyl Declaration (World Medical Association, 2024). Informed consent was obtained from all participants and their privacy was protected when questionnaires were collected. All questionnaires were filled out anonymously and the collected data were used for the study only and not for any other purposes.

Inclusion criteria

- 1) Chinese nationality, all students are from Guangxi;
- 2) Between 18 and 28 years old;
- 3) Informed consent and voluntary participation in this researcher.

Exclusion criteria

- 1) Those with special learning experiences such as exchange students or returning from suspension;
- 2) Those who have been on long-term leave or are on leave;
- 3) Currently suffering from a serious mental or psychological illness.

Sample size estimation

According to the third edition (Xu et al., 2014) of Medical Statistics by Professor Sun Zhenqiu and the regression analysis model, the sample size should be 5 to 10 times the total number of independent variables. The study involved 13 variables, including 10 general data variables and three dimensions of the learning Engagement scale. Taking into account the possibility of missing or invalid responses in the actual collection, the sample size was increased by 20 percent on the original basis. According to the formula: $n = \text{total number of variables} \times 10 \times (1 + 20\%) = 13 \times 10 \times (1 + 20\%) = 156$, the final sample size included in this study was 240.

2.2. Study Design and Survey Methods

This study was designed as a cross-sectional study. It employed the convenience sampling method and questionnaire survey method, and anonymous question-

naires were distributed between November 2025 and May 2026. After obtaining the voluntary informed consent of the students, they were organized to complete the questionnaire on the spot and collected uniformly. Questionnaires with problems such as omissions and improper filling will be returned to the respondents immediately for correction and improvement. A total of 260 questionnaires were sent out in this survey, and 251 were actually returned, of which 240 were valid, with an effective return rate of 92.31%.

2.3. Research Tools

1) General Information Questionnaire: Design the General Information Questionnaire, which includes 13 demographic items such as gender, place of origin, monthly family income, reasons for studying nursing, intention to work, academic ranking in class, participation in student leadership, participation in nursing research, average time spent on social practice or part-time work per week, and clarity of current career planning.

2) Learning Engagement Questionnaire: This study uses the Utrecht Work Engagement Scale-student (UWES-S) (Li & Huang, 2010), which was translated and revised by Li Xiying in 2010 and developed by Schaufeli et al. (2002). The scale consists of 17 items, including three dimensions: motivation (6 items), energy (6 items), and concentration (5 items). Each item is scored on a Likert 7-point scale, with 1 to 7 representing “never, almost never, rarely, sometimes, often, very frequently, always.” The total score is calculated by adding up the scores of each question. The total score ranges from 17 to 119 points. The higher the total score, the higher the learning engagement of the undergraduate nursing student. In order to distinguish the grades of the learning Engagement scale, this study divided the average item scores of the learning engagement scale based on the Likert 7-level scale: <4 for low level, 4 - 5 for medium level, >5 for high level. That is, the total score of the learning engagement questionnaire was <68 as low level, 68 to 85 as medium level, and >85 as high level. Before the formal survey was conducted, 52 students who met the inclusion criteria were selected for a pre-test. The Cronbach’s α of the total scale was measured to be 0.914, and the coefficients of each dimension ranged from 0.768 to 0.851, indicating that the scale had good reliability and validity and could be used in this study. The learning engagement scale is shown in **Figure 1**.

2.4. Statistical Analysis Methods

Data were processed using SPSS 26.0. Measurement data were expressed as mean $\pm$ standard deviation, while count data were expressed as frequency and percentage. The Kolmogorov-Smirnov test was used to test the normality of each group of measurement data before the analysis. The results showed that the total learning engagement and the scores of each dimension were normally distributed ($P > 0.05$), meeting the conditions for subsequent parametric tests (independent sample t-test, one-way *analysis of variance*, *Pearson correlation analysis*). Independent sample t-tests were used for comparisons between two groups, and one-way

analysis of variance was used for comparisons between multiple groups, with $P < 0.05$ being considered statistically significant.

Items and Screenshots of the Learning Engagement Scale Please rate the following statement according to your actual experience, using the 7-point Likert scale below: 1 = Never, 2 = Rarely, 3 = Seldom, 4 = Sometimes, 5 = Often, 6 = Very Frequently, 7 = Always.									
Dimensions	Serial Numbe	Title	AlwaysNo	AlmostNone	Very little	Sometimes	Often	10Frequent	Always
Motivation	1	I am energetic when I study	1	2	3	4	5	6	7
	2	I feel that learning is valuable and meaningful	1	2	3	4	5	6	7
	3	When I study, I feel that time flies	1	2	3	4	5	6	7
	4	I'm interested in learning	1	2	3	4	5	6	7
	5	Learning can stimulate my thirst for knowledge	1	2	3	4	5	6	7
	6	When I focus on my studies, I experience joy	1	2	3	4	5	6	7
Energy	7	I am energetic when studying or in class	1	2	3	4	5	6	7
	8	As soon as I get up in the morning, I am filled with the energy to study	1	2	3	4	5	6	7
	9	I am satisfied with my learning	1	2	3	4	5	6	7
	10	I can keep learning for a long time, full of energy	1	2	3	4	5	6	7
	11	During the learning process, even when mentally exhausted,	1	2	3	4	5	6	7
	12	Even if the learning process is not going well, I can still Stay energetic and keep going	1	2	3	4	5	6	7
Focus	13	When I was studying, I was so focused that I forgot everything around me	1	2	3	4	5	6	7
	14	When I study, I concentrate	1	2	3	4	5	6	7
	15	When it comes to learning, I enjoy exploring new problems	1	2	3	4	5	6	7
	16	When I study, I reach a state of self-forgetfulness	1	2	3	4	5	6	7
	17	When I study, I can focus my attention.	1	2	3	4	5	6	7

Figure 1. Input scale for the learning process.

3. Study Results

3.1. General Information of Undergraduate Nursing Students

A total of 240 research subjects were included. The general data analysis is shown in Table 1.

Table 1. General information analysis of undergraduate nursing students (n = 240).

Variables	Grouping	Frequency (n)	Percentage (%)
Gender	male	107	44.6
	female	133	55.4
Place of origin	City	183	76.3
	Towns and townships	19	7.9
	Rural areas	38	15.8
Per capita monthly household income	<3000	28	11.7
	3000 - 5000	69	28.7
	>5000	143	59.6

Continued

	Good benefits	51	21.3
	Be optimistic about professional development	104	43.3
Reasons for studying nursing	Easy job hunting	41	17.1
	Opinions from parents/others	24	10
	Stable job	9	3.8
	Others	11	4.6
Whether there is a willingness to work in nursing	Willing	104	43.3
	Unwilling	105	43.8
	Uncertain	31	12.9
Grade in class position	Top	124	51.7
	Medium	106	44.2
	Back	10	4.2
Have you ever held a student leadership position	Yes, currently	38	15.8
(Including classes, organizations, clubs, etc.)	Yes, former	158	65.8
	no	44	18.3
Whether participating in research related to nursing	Have led projects at the university level or above	24	10
Or the situation of an innovation project	Participate as a key member	55	22.9
	Not involved, but interested	110	45.8
	Not involved, and not interested	51	21.3
On average each week for part-time work	0 hours (not participating)	103	42.9
Or the duration of social practice is approximately	1 to 8 hours	106	44.2
	9 - 16 hours	26	10.8
	17 hours and more	5	2.1
The current clarity of career planning	Very clear, with definite short-term and long-term goals	53	22.1
	Relatively clear, with a general direction	78	32.5
	Generally, in the process of exploring	60	25
	Rather vague and uncertain	34	14.2
	Very vague, no idea	15	6.3

3.2. Undergraduate Nursing Students' Learning Engagement

The total learning engagement of 240 undergraduate nursing students was (81.15 $\pm$ 18.39) points, which was at a medium level. The specific scores for each dimension are shown in **Table 2**. To more objectively reflect the actual level of each dimension on the scale, the average score of each dimension item was further cal-

culated (the median of the scale was 4 points), and the results showed that the average score of the items in the three dimensions was in the medium range. Among them, the motivation dimension had the highest average score (5.20 ± 1.20), and the energy dimension had the lowest average score (4.48 ± 1.27).

Table 2. Total score of learning engagement for undergraduate nursing students and scores of each dimension (points, $\bar{x} \pm s$).

Dimensions	Dimension total score	Average dimension score	At the level
Motivation	31.18 ± 7.24	5.20 ± 1.20	Medium level
Energy	26.87 ± 7.63	4.48 ± 1.27	Medium level
Focus	23.10 ± 6.01	4.62 ± 1.20	Medium level
Learning engagement	81.15 ± 18.39	4.77 ± 1.08	Moderate level

3.3. Analysis of Factors Influencing Learning Engagement among Undergraduate Nursing Students

3.3.1. Univariate Analysis of Learning Engagement for Undergraduate Nursing Students

The normality test showed that the total learning engagement scores of different groups followed a normal distribution ($P > 0.05$). Univariate analysis was used to screen the general data, and the results showed that the differences in learning engagement scores were statistically significant ($P < 0.05$) in terms of average monthly household income per capita, reasons for enrolling in nursing, willingness to work in nursing, academic ranking in class, participation in nursing research or innovation projects, average weekly time spent on part-time or social practice, and clarity of current career planning. The specific results are shown in **Table 3**.

Table 3. Univariate analysis of learning engagement for undergraduate nursing students ($n = 240$).

Project	Number of people (names)	Learning engagement score ($\bar{x} \pm S$)	Statistic values	P value
Monthly per capita household income			3.505	0.032
<3000	28	72.61 ± 9.60		
3000 - 5000	69	81.97 ± 19.92		
>5000	143	82.43 ± 18.59		
Reasons for studying nursing			2.925	0.014
Good benefits	51	84.82 ± 21.35		
Be optimistic about professional development	104	82.14 ± 18.49		
Easy job hunting	41	83.12 ± 17.71		
Opinions from parents/others	24	71.08 ± 9.83		
Stable job	9	80.33 ± 7.30		
Others	11	70.00 ± 17.13		

Continued

Whether there is a willingness to work in nursing		6.205	0.002
Willing	104	78.33 ± 17.04	
Unwilling	105	85.67 ± 19.09	
Uncertain	31	75.32 ± 17.35	
Grade in class position		5.163	0.006
Top (top 30%)	124	84.60 ± 16.93	
Medium (middle 40%)	106	77.96 ± 19.92	
Back (back 30%)	10	72.10 ± 7.82	
Whether to participate in research related to nursing Or innovation projects		2.745	0.044
Have led projects at the university level or above	24	74.17 ± 28.15	
Participated as a key member	55	78.31 ± 18.28	
Not involved, but interested	110	82.01 ± 15.55	
Not involved, and not interested	51	85.65 ± 17.63	
The average weekly time spent on part-time or social practice		3.285	0.022
0 hours (not participating)	103	78.95 ± 18.55	
1 - 8 hours	106	81.16 ± 18.25	
9 - 16 hours	26	91.04 ± 16.09	
17 hours and more	5	74.80 ± 16.63	
Clarity of current career planning		3.372	0.01
Very clear and definite	53	75.13 ± 22.09	
Short-term and long-term goals			
Relatively clear, with a general direction	78	84.12 ± 16.16	
Generally, in the process of exploring	60	78.72 ± 16.29	
Rather vague and uncertain	34	84.24 ± 17.60	
Very vague, no idea	15	89.73 ± 19.14	

Note: Only the statistically significant variables are listed. The rest of the variables have no statistically significant differences ($P > 0.05$), and the table is omitted.

3.3.2. Correlation Analysis of Learning Engagement for Undergraduate Nursing Students

Since the independent variables screened out by single-factor analysis contain unordered categorical variables (such as reasons for studying nursing, willingness to engage in nursing work, and participation in nursing-related research or innovation projects), Pearson correlation analysis is not suitable to be directly adopted. Therefore, Pearson correlation analysis was conducted only on continuous or hierarchical variables (monthly income per capita in the family, academic ranking in the class, average time spent on part-time jobs or social practice per week, clar-

ity of current career planning) to initially determine their linear relationship with total learning engagement and to provide a reference for collinearity diagnosis in subsequent regression models (Table 4).

The results showed that there was a significant positive correlation ($P < 0.05$) between average monthly income per household, class ranking, average weekly time spent on part-time jobs or social practice, and current career planning clarity. The absolute values of the correlation coefficients among the variables were all below 0.4, not reaching the collinearity threshold of 0.7, which met the inclusion criteria for multiple linear regression (Table 4).

For unordered categorical variables, the univariate analysis results show: The differences in reasons for studying nursing ($P = 0.014$), willingness to work in nursing ($P = 0.002$), participation in research or innovation projects related to nursing ($P = 0.044$) and total learning engagement were statistically significant and will subsequently be included as independent variables (set as dummy variables) in the regression model.

Table 4. Correlation analysis of learning engagement for undergraduate nursing students ($n = 240$).

Variables	Total score	Average monthly income per household	Rank in the class	Average weekly part-time or duration of social practice	Clarity of current career planning
Total score	1				
Average monthly income per household	0.138*	1			
Grade in class position	0.204**	0.181**	1		
Average weekly part-time or Duration of social practice	0.129*	-0.178**	0.037	1	
Clarity of current career planning	0.150*	-0.034	-0.006	0.066	1

Note: * $P < 0.05$, ** $P < 0.01$.

3.3.3. The Results of the Multiple Linear Regression Analysis on the Learning Engagement of Undergraduate Nursing Students Are Presented

The total score of learning engagement was set as the dependent variable, and seven variables that reached a significant level in the univariate analysis (per capita monthly income of the family, reasons for attending the major, willingness to engage in nursing, academic ranking in the class, participation in research projects, average part-time time per week, clarity of career planning) were simultaneously included in the multiple linear regression analysis (Table 6).

The results showed that reasons for studying nursing (particularly “parental/other person opinions” and “other” reasons), class ranking, and whether to lead a research project were independent influencing factors of learning engagement ($P < 0.05$) (Table 6). Specifically, those who chose nursing due to “good

benefits” had higher learning engagement. The higher the class position, the higher the learning engagement. Those who did not participate in research projects had higher learning engagement than those who led projects. The regression effects were not significant ($P > 0.05$) in terms of average monthly income per household, average part-time time per week, clarity of career planning, and willingness to engage in nursing work. The methods for assigning independent variables are shown in **Table 5**, and the regression results are shown in **Table 6**.

Table 5. Independent variable assignment.

Independent variable	Assignment method
Per capita monthly income of the family	Less than 3000 yuan = 1; 3000 - 5000 = 2; More than 5000 yuan = 3
Reasons for enrolling in nursing	With “good benefits” as the reference, set five dummy variables: promising career development, easy job hunting, parents’/others’ opinions, job stability, others
Whether there is a willingness to work in nursing	With “willing” as the reference, set two dummy variables: unwilling and uncertain
Grade in class position	Back (back 30%) = 1; Medium (middle 40%) = 2; Top (top 30%) = 3
Whether participating in research or innovation projects related to nursing	With “not participated and not interested” as the reference, set three dummy variables: led a university-level or higher project, participated as a key member, not participated but interested
The average weekly time spent on part-time jobs or social practice	0 hours (not participating) = 1; 1 - 8 hours = 2; 9 - 16 hours = 3; 17 hours and more = 4
Clarity of current career planning	Very vague = 1; Rather vague = 2; Generally = 3; Relatively clear = 4; Very clear = 5 (considered continuous variable)

Table 6. Multiple linear regression analysis of learning engagement of nursing undergraduates (n = 240).

Independent variable	Regression coefficient (B)	Standard error (sx)	Standard regression system (β)	t value	P value
Constant	62.496	8.088	—	7.727	<0.001
Monthly per capita household income	1.138	1.831	0.043	0.622	0.535
Reasons for studying nursing (Promising career prospects)	-3.841	3.021	-0.104	-1.271	0.205
Reasons for studying nursing (Good job prospects)	-2.509	3.705	-0.051	-0.677	0.499
Reasons for studying nursing (Parental/other person’s opinion)	-11.425	4.626	-0.187	-2.47	0.014
Reasons for enrolling in nursing (stable job)	-4.244	6.322	-0.044	-0.671	0.503
Reasons for studying nursing (Others)	-14.597	5.915	-0.166	-2.468	0.014

Continued

Are you willing to work in nursing (not willing)?	3.050	2.644	0.082	1.153	0.25
Whether there is a willingness to engage in nursing work (uncertain)	-3.110	3.990	-0.057	-0.779	0.437
Grade in class position	5.551	2.023	0.174	2.743	0.007
Have you participated in any research or innovation projects related to nursing (having presided over projects at the university level or above)?	-9.591	4.554	-0.157	-2.106	0.036
Have participated in research or innovation projects related to nursing (as a key member)	-5.575	3.596	-0.128	-1.550	0.122
Whether participating in research or innovation projects related to nursing (not participating but interested)	-2.271	3.161	-0.062	-0.718	0.473
On average per week for part-time or Time for social practice	2.359	1.590	0.095	1.483	0.139
Clarity of current career planning	1.778	1.070	0.113	1.661	0.098

* Note: $R^2 = 0.173$, adjusted $R = 0.121$, $F = 3.357$, $P < 0.001^*$. The reference groups were: Reasons for enrollment = good welfare benefits; Intention = willing; Research participation = no participation and no interest.

4. Discussion

4.1. General Information Analysis of Undergraduate Nursing Students

A total of 240 undergraduate nursing students were included in this study, including 107 male students (44.6%) and 133 female students (55.4%). The proportion of male students in this survey was significantly higher than that in previous nursing programs, which were predominantly female. In terms of place of origin, urban students accounted for 76.3%; The proportion of families with a per capita monthly income of more than 5000 yuan is 59.6 percent. 51.7 percent of students ranked in the top 30 percent of their class, 32.1 percent said they liked nursing, 43.3 percent intended to work in nursing, and 33.3 percent intended to continue their studies. In terms of practical experience, 81.6% have served as student leaders, 32.9% have participated in or led research projects, and 44.2% have spent 1 to 8 hours of part-time work or social practice per week. Students with well-defined career plans accounted for 54.6 percent. Overall, the academic engagement behavior of undergraduate nursing students is influenced by various factors such as family capital, professional identity, academic performance, research participation, and the clarity of career planning. The demographic and academic background differences suggest that nursing educators should take into account the individual characteristics of students and adopt differentiated intervention strategies for different groups to achieve more precise teaching guidance (Table 1).

4.2. Analysis of Learning Engagement for Undergraduate Nursing Students

The results of this survey showed that the total learning engagement of undergraduate nursing students was (81.15 ± 18.39) , which was at a medium level and basically close to the research results of Ni Jingyi et al. (Ni et al., 2023), Liu Chang et al. (Liu et al., 2024), indicating that there is considerable room for improvement. Due to the fact that some students' perception of the nursing major is still superficial, such as "stable employment" and "good benefits", and they do not have a deep understanding of the nursing major, coupled with the extensive and diverse content of nursing courses and high practical requirements, it is easy to experience fatigue and anxiety during the learning process, which in turn affects the persistence (Liu et al., 2026) of learning (Table 2).

Among the dimensions, motivation scored the highest (5.20 ± 1.20) , while energy scored the lowest (4.48 ± 1.27) , indicating that although students recognize the value of learning, they tend to feel tired and lack sustained energy in the actual learning process. This suggests that educators should attach importance to ideological and moral education and guide students to transform external motivation into internal motivation. At the same time, attention should also be paid to their physical and mental health as well as their ability (Sun et al., 2022) to manage energy. The learning engagement of undergraduate nursing students is regulated by multiple aspects and requires different guidance methods. Based on this, it is recommended to add a psychological adjustment section, enhance communication and psychological counseling between teachers and students, and establish an academic support and reward system to enhance students' self-confidence and perseverance. On this basis, further enhance students' enthusiasm for learning and participation, and ultimately improve overall learning efficiency.

4.3. A Single-Factor Analysis of Learning Engagement for Undergraduate Nursing Students

The results of the univariate analysis showed that factors such as average monthly income per household, reasons for studying nursing, willingness to work in nursing, academic ranking in class, participation in research or innovation projects related to nursing, duration of part-time or social practice, and clarity of career planning all had significant effects on learning engagement ($P < 0.05$) (Table 3). Specifically, students with better family economic conditions, those who chose nursing out of intrinsic motivation or clear positive incentives, those who were willing to work in nursing, those with excellent academic performance, those who participated in 1 to 8 hours of social practice per week, and those with clear career planning had relatively higher levels of learning engagement. Interestingly, students who have led research projects score less on academic engagement than those who have never participated, which may suggest that undertaking research tasks takes up daily study energy. Overall, the learning engagement of undergraduate nursing students is influenced by multiple factors, and educators should

adopt differentiated guiding strategies based on the factors that can be intervened.

4.4. A Study on Predictive Factors of Learning Engagement of Undergraduate Nursing Students

After incorporating the seven variables that reached a significant level in the univariate analysis into the multiple linear regression model, the results showed that only the reasons for enrolling in the nursing major, class ranking, and participation in scientific research projects were independently significant ($P < 0.05$) (**Table 6**). The average monthly income per household, willingness to work in nursing, average weekly time spent on part-time or social practice, and current clarity of career planning were no longer statistically significant after controlling for other variables ($P > 0.05$). This suggests that the influence of these four variables on learning engagement may be indirect through other factors (such as professional identity or academic performance), rather than independent direct influencing factors.

4.4.1. Reasons for Enrolling in Nursing

Compared with students who enrolled in nursing for “good benefits”, students who enrolled for “parental/other person opinions” or “other” reasons had significantly lower learning engagement scores ($B = -11.425$ to -14.597 , $P < 0.05$), consistent with previous (Liu et al., 2021) studies (**Table 6**). This suggests that a clear and specific expectation of career returns can indeed serve as a powerful initial traction that drives students to engage in learning. However, the stability of extrinsic motivation is usually not as strong as that of intrinsic motivation. Professional identity is the psychological foundation of learning engagement, and a lack of intrinsic motivation can lead to burnout and passive coping. Research indicates that professional identity can influence learning burnout through learning engagement, and students with lower professional identity are more likely to experience academic burnout in addition to insufficient learning engagement. Therefore, colleges and universities should focus on guiding students’ professional thinking at the beginning of their enrollment (Wei & Li, 2024), especially those who rely solely on external motivation or passively choose their majors, and guide them to gradually shift from the initial idea of “for welfare benefits” to a deeper level of “recognition of professional value”. The specific approaches include organizing relevant lectures, inviting outstanding nurses to share their professional experiences, or arranging for students to experience the working scenarios in hospitals, etc., so that they can gradually accept and recognize the nursing profession they are learning, while gradually turning external pressure into their own motivation for learning.

4.4.2. Class Grades and Rankings

According to the results of this survey, students who rank high in academic performance score significantly higher in terms of learning engagement than those with average or lower grades (**Table 6**). The regression analysis further showed

that the higher the academic ranking, the higher the level of learning engagement ($B = 5.551$, $P = 0.007$), which is consistent with the findings of Long et al. (Long 2020), indicating a mutually reinforcing positive cycle between academic performance and learning engagement. Good academic performance helps to continuously strengthen students' own academic self-efficacy, which is precisely the core intrinsic driving force that affects learning engagement. Qi Weiye and Fu Jufang's study of 236 undergraduate nursing students found that academic self-efficacy not only directly promotes academic engagement but also has an indirect effect through the mediating path of "solution-focused thinking", and this indirect effect accounts for 31.25% (Qi & Fu, 2021) of the overall effect. In other words, students with high academic rankings, having accumulated a strong sense of academic self-efficacy through long-term positive feedback, are more willing to spend time and effort to maintain and improve their grades, thus forming a virtuous cycle of "high engagement - good grades - higher engagement". Students with lower grades may gradually weaken their sense of self-efficacy in repeated negative feedback, and their willingness to engage will also decline, creating a negative cycle that requires intervention. Therefore, attention should be paid to students with academic difficulties by establishing academic early warning and assistance mechanisms, promoting peer learning, providing personalized tutoring, etc. Academic support should be given as early as possible, supplemented by psychological counseling to help students relieve stress.

4.4.3. Participation in Research Projects

The study found that students who led research projects at the university level or above had lower learning engagement scores than those who did not participate in research projects, and regression analysis also showed a significant negative correlation with learning engagement ($B = -9.591$, $P = 0.036$) (Table 6). This finding suggests that independently leading research projects can impose a significant burden on daily study: research tasks are difficult, time-consuming, and require a high level of academic ability. Some students feel overly stressed during the research process, which takes up time and energy (Wang, 2021) for regular course study. While encouraging students to participate in research activities, universities should provide corresponding guidance and support resources, establish a three-level guidance system of "mentors - postgraduates - undergraduates", and allocate research tasks reasonably based on students' academic foundations, so that research does not become a burden for students. In addition, research activities should be included in the comprehensive quality assessment to organically integrate research with daily teaching. At the same time, students should be guided to combine the research process with in-class learning, so that they can gain more pleasure from it and thereby stimulate their intrinsic motivation for learning.

5. Conclusions

- 1) The survey shows that the learning engagement of undergraduate nursing students is at a medium level and still needs to be improved.

2) Multiple linear regression analysis indicated that reasons for enrolling in nursing, class ranking, and participation in research projects were independent influencing factors of learning engagement.

3) Specifically, those who chose nursing because of “good benefits” had higher learning engagement; The higher the academic position in the class, the higher the academic engagement; Those who did not participate in research projects had higher learning engagement than those who led projects.

6. Limitations of This Study

This study was a single-center cross-sectional study with a small sample size. The conclusions drawn from it have certain limitations. In the future, more multi-center studies should be conducted to increase the sample size, in order to obtain more convincing evidence.

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Conflicts of Interest

None of the authors have a conflict of interest.

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