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Article

Current Status and Influencing Factors of Nursing Students' Health Education Ability in Tertiary Vocational Colleges in Nanjing China

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Abstract: Objective: This study aims to survey the current health education ability of nursing students in Nanjing, China and explore influencing factors affecting their ability of health education. **Methods:** Using a cross-sectional descriptive design and convenience sampling, 282 tertiary vocational college nursing interns from 8 triple-A hospitals are investigated using by Health education ability self-assessment scale for nursing students. The collected data were analyzed using SPSS20.0. **Results:** The total healthy education ability score of nursing interns is 157.95 ± 21.90. None of the dimensions qualifies the "basic level" of health education ability. School GPA, nursing research courses, attendance in health education activities, passion for the nursing career, awareness of the importance of health education, receiving skills on health education are statistically significant influencing factors on healthy education abilities (t/F scores are 2.873, 3.025, 3.289, 9.506, 5.884, 2.043; $p < 0.05$). Based on multi-regression analysis, passion for the nursing career, nursing research courses and attendance in health education activities are the key influencing factors ($p < 0.05$). **Conclusion:** The overall health education abilities of nursing interns from tertiary vocational colleges are relatively low. These colleges should strengthen research abilities of nursing students and promote the teaching of health education skills and abilities.

Keywords: tertiary vocational nursing colleges; nursing intern; health education

1. Introduction

Health promotion is an important part of the Healthy China strategy. The level of citizen health literacy has become an important indicator of the "Healthy China 2030" planning Outline and the "Healthy China Action" [1]. In recent years, the state is paying more and more attention to health promotion. The level of health literacy of Chinese is constantly improving, but the distribution is still uneven between urban and rural areas. A study on the status of healthy lifestyle and behavioral literacy of urban and rural residents in Jiangsu Province shows that although the overall level of healthy lifestyle and behavioral literacy of citizens in Jiangsu Province has improved, their understanding of certain health knowledge areas is seriously insufficient [2]. Chen *et al.* [3] investigated the status quo of health literacy of residents in Gulou District of Nanjing, China and pointed out that future health promotion work should be carried out according to age, education level, occupation among other factors.

Nursing is closely related to the health of people. The professional goal of nursing has always been to "promote health, prevent disease, restore health, and alleviate suffering". Improvements of nursing service level help residents establish a healthy lifestyle and raise awareness of health care.

One of the four trends in the development of nursing in the 21st century is that nurses are becoming the main undertakers of health education and the key force to improve citizens' health literacy [4]. Vocational nurses account for a large proportion of hospital personnel and have the most contact with patients in China, but most of them lack the awareness, knowledge and skills to carry out health education. This is because most vocational nursing students do not systematically learn how to carry out health education for patients during school study and hospital internship, and their ability of health education is seriously insufficient, which indirectly affects the quality of health education information received by patients and cannot meet the patients' increasing demand for health education. This study aims to survey the status quo of health education ability of vocational nursing students in Nanjing during their internship and provide reference for how to improve the health education capacity of nursing students.

Literature Review

For several decades, the World Health Organization (WHO) has stated the need for a reorientation of healthcare services from a sole focus on illness and disease to one that encompasses both disease prevention and health promotion [5]. Some excellent examples of nurse-led health promotion initiatives can be found in the literature [6,7]. Health promotion became a trendy concept in the 1990s, which coincided with the emergence of curriculum reforms that incorporated health promotion as a fundamental principle in nursing education [8–13]. Many studies have conducted on preparation of nurse graduates in health promotion. Diebold *et al*. [14] described a process in which senior students developed a health promotion initiative to implement during a health fair, addressing a range of topics including nutrition, sexually transmitted diseases, mental health, birth control, high-risk behaviors, and breast and testicular self-examination. Hsiao *et al*. designed a health promotion module for nursing students in Taiwan. 65 nursing students completed pre- and post-test questionnaires during a 34-h health promotion course [15]. The course was designed to improve the health behaviors of students, so that they may begin to understand this concept for their patients. Ransom promotes the utilization of Orem's Self-Care Deficit Nursing Theory (SCDNT) (Orem, 2001) as the foundation for undergraduate nursing curriculum [16]. The utilization of this model within the curriculum guarantees an emphasis on self-care and health promotion, rather than the more traditional focus on diseases. Although many studies examined approaches to the teaching of health promotion internationally, there are few reports on the investigation of the health education ability of vocational nursing students. To the best of our knowledge, this is the first study investigating the current health education ability of vocational nursing students in China.

2. Theoretical Background

This study adopts the Health Promotion Model as its theoretical framework [17,18]. Health Promotion Model provides a structure to explain the relationship among characteristics and experiences, behavior-specific cognitions and effects, as well as behavioral outcomes. As Figure 1 shows, this study was performed to establish the theoretical framework of student nurses' health education capacity. Passion for nursing career and awareness of importance of health education are the key parts of this framework. However, at present, there are no mature, objective, and standard scales for measuring them.

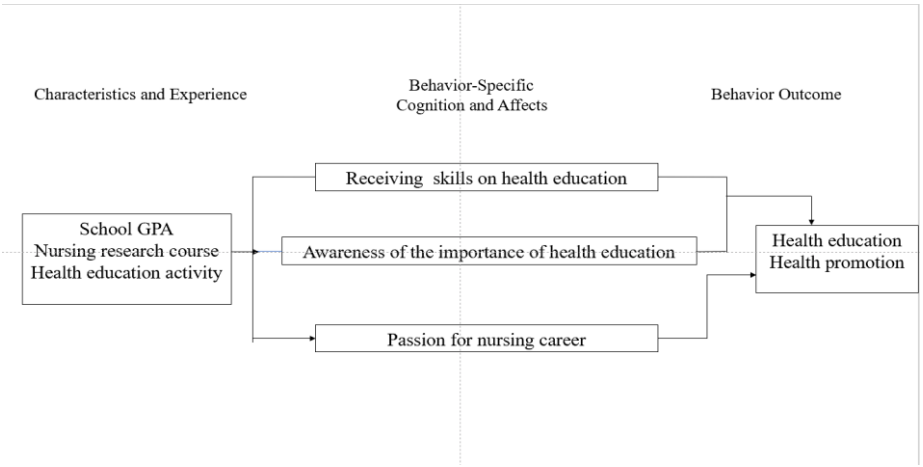

Figure 1. The theoretical framework of this study.

3. Method

3.1. Study Design

This is a cross-sectional descriptive design to investigate the levels of the current health education capacity of nursing students in Nanjing, China and explore the influencing factors.

3.2. Participants and Setting

A convenience sample of 282 nursing students was recruited from eight tertiary hospitals in Nanjing. Because Nanjing is one of the most developed cities in China, the research outcomes derived from this sample are considered representative. The inclusion criteria for interns are: (1) voluntary participation, (2) having completed theoretical courses in school and entering clinical practice for more than 6 months, and (3) having a college degree.

3.3. Sample Size

We used a set of questionnaires including a total of 24 variables: a demographic questionnaire (20 items), the self-rated abilities for health education capacity (four dimensions). According to Kendall's simple sample size calculation method, the sample size was obtained using the number of variables multiplied by 10, that is, including approximately 240 intern nurses. Finally, according to the potential loss rate of 20%, we recruited 300 participants from eight different tertiary hospitals in Nanjing.

3.4. Instruments

This study was based on a questionnaire survey. The following two questionnaire tools were utilized.

(1) A demographic questionnaire was used to collect individual information, including school GPA, attitude towards nursing career, awareness of the importance of health education, health education training for nursing interns during their time in school and hospital.

(2) The Chinese version of the self-rated abilities for health education capacity was developed by Professor Fu's research team from School of Nursing in Hangzhou Normal University and reported Cronbach's α for the scale ranging from 0.92 to 0.94. It was used to assess to the health education capacity. The scale includes 40-items that can be classified into four dimensions: assessing health education (thirteen items), planning health education (eight items), implementing health education (nine items) and evaluating health education (ten items). Each item is scored on a Likert 5-point scale, ranging from "completely agree" to "completely disagree," with scores ranging from 5 to 1. The content validity ratio (CVI) for all items is 0.86.

3.5. Data Collection and Analysis

We recruited participants strictly according to the inclusion criteria described in Section 3.2. Before the formal survey, 30 nursing interns were selected for a pre-survey, and feedback was used to modify and improve the questionnaire. During the formal survey, the researcher explained the purpose, content, and significance of the survey face-to-face, obtained the participant's permission, and then asked the participant to fill out the questionnaire anonymously. The survey took approximately 10 min to complete. The questionnaire was distributed on-site and immediately collected, and on-site checks were conducted to ensure that no items were missed.

EpiData (version 3.0) was used to build a database. The collected data were analyzed using SPSS (version 20.0). The measurement data were expressed as mean ± standard deviation (X ± SD). The Student *t*-test and analysis of variance were used to compare the health education ability scores of nursing interns in higher vocational colleges under different factors, and the variables with statistical significance were selected as independent variables. The total score of health education ability of nursing interns was used as the dependent variable for multiple stepwise regression. $p < 0.05$ was considered statistically significant.

3.6. Ethical Considerations

The researchers explained to the participants the research's purpose, contents, and significance face-to-face. How to correctly complete the questionnaires was also told. Researchers also informed them that their participation was completely anonymous and voluntary. Data collecting were only going to be used in this study and would never be delivered to a third party without the participants' permission.

4. Results

4.1. Participant Characteristics

Researchers distributed the questionnaires among 300 nursing interns and received 282 effective responses (a 95.0% response rate). The interns were aged between 19 and 23, with 96.1% of them having an internship period for more than 9 months. In terms of academic performance, 265 interns (94%) had a median or above grade point average. In terms of career attitude, 197 interns (69.9%) were very enthusiastic and passionate about the nursing profession. In terms of cognition of the importance of health education, 280 interns (99.3%) believed that health education was very important and important. In terms of health education training during their school years, 155 interns (55%) had attended a course on "Nursing Research", and 260 interns (92.2%) had attended a course on "Health Statistics". The top three items that need to be improved in nursing health education teaching are: improving teaching methods (59.2%), improving course settings (51.1%), and clarifying teaching goals (33.0%). 191 interns (67.7%) had participated in health education activities during their school years. During their internship at the hospital, 92.9% of the interns had received hospital training or lectures on knowledge, content, and skills of health education. 97.5% and 91.5% of the internship supervisors had explained health education-related knowledge and skills to the interns. The top three factors that the interns believed would affect their ability to implement health education for patients were their grasp of disease knowledge (87.6%), communication skills (71.3%), and the need for patient/family member health education (51.8%).

4.2. Scores of Health Education Ability

The total score of health education ability of nursing interns was 157.95 ± 21.90 points. The average scores of each dimension item were: assessment (3.97 ± 0.55) points, planning (3.97 ± 0.58) points, implementation (3.93 ± 0.59) points, and evaluation (3.92 ± 0.60) points. The assessment and planning dimensions were the highest, while the evaluation dimension was the lowest. None of the four dimensions reached the "basic compliance" level.

4.3. The Top and the Bottom 5 Items in the Health Education Competency Score

Table 1 shows the scores of the top and the bottom 5 items in the health education competency. Item 1 (Establishing a cooperative relationship with patients/families is beneficial for the evaluation of the patient's current status) in the evaluation dimension, and item 19 (I can obtain the support and recognition of my supervisor for health education activities) in the planning dimension have the highest scores. Among the bottom 5 items in the health education competency score, item 36 (Statistical method application) in the evaluation dimension, and item 27 (Organizing health education activities) in the implementation dimension both have the lowest scores.

Table 1. Scores of the top and the bottom 5 items in the health education competency among the 282 survey participants.

Item	The Lowest Score	The Highest Score	Mean Score	Standard Deviation
Top 5				
Item1 Establish a cooperative relationship with patients/families	1	5	4.20	0.634
Item 19 Obtain support and recognition	1	5	4.10	0.635
Item 8 Identify partners	1	5	4.07	0.673
Item 21 Create a comfortable environment	1	5	4.05	0.665
Item32 Adopt the method of patient demonstration	1	5	4.05	0.644
Bottom 5				
Item 36 Application of statistical methods	1	5	3.62	0.886
Item 27 Organize health education activities	1	5	3.79	0.806
Item12 Application of research methods and tools	1	5	3.83	0.745
Item15 Identify health education resources	1	5	3.85	0.705
Item34 Use a questionnaire to evaluate the results of health education	1	5	3.85	0.794

4.4. Comparison of Total Score of Health Education Ability of Interns with Different General Information

As shown in Table 2, factors such as the school GPA, whether the school offered a nursing research course, whether student nurses participated in health education activities, student nurses' level of enthusiasm for nursing, their perception of the importance of health education and whether the clinical teachers at the internship hospital imparted health education skills have significant impacts on the health education ability of vocational nursing interns ($p < 0.05$).

Table 2. Comparison of health education ability scores of nursing students under different factors.

Item	Number of People	Total Score of Health Education Ability	t/F	*p*
School GPA				
Excellent	40	165.20 ± 20.32	2.873	0.023
Good	144	156.55 ± 19.92		
Average	81	155.67 ± 24.19		
Pass	17	166.31 ± 25.40		
Offer Nursing research course				
Yes	155	162.77 ± 21.22	3.025	0.003
No	127	153.56 ± 23.75		
Offer Health statistics course				
Yes	260	158.17 ± 21.95	0.407	0.684
No	22	156.00 ± 19.53		
Participate in health education activities				
Yes	191	161.60 ± 20.51	3.289	0.001
No	91	151.30 ± 18.86		
Passion for the nursing career				
Very passionate about it.	34	175.35 ± 19.93	9.506	<0.001
Love it	163	156.75 ± 20.86		
Not sure	70	153.90 ± 20.44		
Not interested	15	150.40 ± 26.43		
Cognition of the importance of health education				
Extremely important	202	160.57 ± 22.47	5.884	0.003
Important	78	150.90 ± 18.26		
Average	2	167.50 ± 45.96		
Clinical teachers impart health education knowledge				
Yes	275	158.39 ± 21.73	1.704	0.089
No	7	141.60 ± 28.06		
Clinical teachers impart health education skill				
Yes	258	159.14 ± 21.69	2.043	0.042
No	19	148.63 ± 21.01		

Represents P-value < 0.05.

4.5. Multivariate Regression of Influencing Factors on the Health Education Ability of Nursing Students

Using the total score of health education ability of nursing students as the dependent variable, and the factors that affect the score of health education ability after univariate analysis as the independent variables, multivariate regression analysis was conducted. The results showed that the internship nursing students' passion for the nursing career, nursing research course and attendance in health education activities were the main factors affecting their health education ability (as shown in Table 3, $R = 0.350$, $R^2 = 0.122$, $F = 12.899$, $p < 0.01$).

Table 3. Analysis of significant variables using multiple linear regression.

Variable	β	SE	β	T	*p*
Constant	128.275	6.514		19.693	0.000
Passion for the nursing career	5.533	1.745	0.184	3.170	0.002
Nursing research course	6.981	2.622	0.159	2.663	0.008
Attendance in health education activities	7.381	2.788	0.158	2.647	0.009

$R = 0.350$, $R^2 = 0.122$, $F = 12.899$, $p < 0.01$.

5. Discussion

The 2020 National Health and Health Conference and the "Healthy China 2030 Plan" both emphasized the importance of strengthening health education information services to provide scientific, applicable, and behavioral guidance-oriented health education information to the people. As important members of health education service work, nurses play a significant role in improving the health literacy of the public. The results of this study showed that the health education ability of nursing students in vocational colleges in Nanjing was relatively low, which is consistent with the results of related studies. The five lowest-scoring items mainly reflected the ability of nursing students to organize health education activities and apply research methods in nursing health education. Multiple regression analysis showed that offering a "Nursing Research" course was one of the key factors affecting the health education ability of nursing students in vocational colleges. The "Nursing Research" course is mainly offered to nursing undergraduate and graduate students, explaining literature search methods, quantitative and qualitative research methods, and emphasizing the cultivation of students' awareness of scientific research and critical thinking training. The mastery of the content of the "Nursing Research" course directly affects the quality of health education activities carried out by nursing students. However, few nursing colleges at the vocational level offer a dedicated "Nursing Research" course. This is related to the fact that vocational nursing colleges place more emphasis on cultivating applied skilled talents. In addition, this course is difficult, and challenging for students at the vocational level.

"Nursing Health Promotion and Health Education" is a newly emerging applied basic discipline in China with multiple interdisciplinary overlaps, covering preventive medicine, social medicine, education, and health behavior studies. Some nursing undergraduate colleges have used the "Health Education" course as a substitute for the more difficult "Nursing Research" course by incorporating "nursing health promotion and health education research methods" in the curriculum through case studies and field research to enhance the health education ability of nursing students. This course can be used for teaching at the vocational level to replace the more difficult "Nursing Research" course. Currently, most vocational nursing colleges have not yet offered courses related to "Health Promotion" nor "Health Education". There is a lack of systematic learning on how to provide health education to patients, resulting in significant deficiencies in health education abilities. Therefore, in the future, vocational nursing colleges should actively offer "Health Education" related courses. Through courses that include teaching basic concepts of health promotion and nursing, as well as methods for carrying out health promotion research and planning health education programs, students will be able to understand the relationship between health promotion and nursing care. Students will also be able to select appropriate health promotion models based on the health needs of different populations, work independently or collaborate with others in carrying out health promotion work in the field of nursing care, and improve their health education abilities.

The degree of love for nursing is an important factor influencing the health education ability of vocational nursing students. In this survey, 197 nursing students who were very passionate about or passionate about nursing accounted for 69.9% of the participants. Good nursing professional values can drive nursing students to love their jobs in the clinical internship process, play their personal subjective initiative, improve their willingness to implement health education activities for patients, and thereby provide high-quality health education for patients. The development of professional values is undertaken throughout the whole nursing career. The cultivation of students' professional values in school has an important impact on the formation of their initial professional values. Vocational nursing colleges and universities can help nursing students establish positive professional ideals and career concepts in the first semester through nursing courses such as "Introduction to Nursing". At the same time, as role models, nursing teachers can demonstrate professional values to students through personal behavior. In addition, research has shown that providing clinical practice opportunities for nursing students during their studies in nursing professional courses can increase their

professional emotional experience and enrich their professional values. By actively guiding vocational nursing students to establish positive professional values, we can improve their health education ability and provide high-quality nursing services to the people.

Results of the multiple linear regression analysis showed that participating in health education activities is an important factor affecting patients' health education abilities. The survey indicates that the ability of nursing students to organize health education activities ranks in the bottom five factors. The nursing teaching models in foreign countries differ from those in China. Nursing students enter clinical internships during their theoretical studies in the early grades, and classroom teaching and clinical practice are alternated. Classroom learning and hospital/community internship are closely integrated in nursing education. For example, in American nursing course design, theoretical and practical class hours are equal, and nursing students use high-fidelity simulators to carry out health education according to clinical cases, comprehensively improving their health education abilities. Therefore, in the process of deepening career teaching reform, nursing colleges and universities should aim to improve nursing students' health education abilities by combining theoretical teaching with practical training, increasing the time of health education activities for nursing students in professional courses, providing more health education practice opportunities for nursing students in cooperation with hospitals, strengthening health education skills in clinical internships, and taking comprehensive measures to improve the overall quality of nursing students.

6. Conclusion and Future Work

The overall health education ability of nursing students in Nanjing vocational colleges is relatively low. The degree of passion for nursing career, the "Nursing Research" course, and participation in health education activities are important factors affecting the health education ability of nursing students in Nanjing vocational colleges. Vocational nursing colleges should enhance the health education ability of nursing students through comprehensive approaches such as offering elective courses of "Health Promotion", guiding the establishment of positive professional values, and increasing health education practice activities, so as to improve their comprehensive quality.

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Author Contributions

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Informed Consent Statement

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Data Availability Statement

Not applicable.

Conflicts of Interest

The authors declare no conflict of interest.

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