

# Attitude of Nursing Students towards Internet Plus Nursing Service

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## Research article

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# Abstract

**Background:** In 2019, China completed the pilot project “Internet Plus Nursing Service.” The study aimed to investigate the attitude, willingness, and motivation of third-year undergraduate nursing students toward “Internet Plus Nursing Service,” providing a reference for the development of “Internet Plus Nursing Service” and related nursing education.

**Methods:** This cross-sectional study comprised 508 third-year undergraduate nursing students from a public University of Traditional Chinese Medicine, using a self-designed survey.

**Results:** Of these 508 nursing students, 314 (61.81%) expressed support for the implementation of “Internet Plus Nursing Service,” 150 (29.52%) remained neutral and 44 (8.66%) expressed disapproval. In regards to career choice, 279 (54.92%) were willing to choose “Internet Plus Nursing Service” as their future career choice, 51 (10.04%) were unwilling, and 178 (35.04%) were unsure. The top three motivations to choose “Internet Plus Nursing Service” as their future career choice were added income, high autonomy and flexibility, and good job prospects. On the contrary, the top three motivation not to choose were safety concern, lack of time and energy, unwilling elderly care. gender, whether an only child or not, home location, and degree of knowledge and skills required for elderly care were not significantly associated with the willingness of nursing students to participate in “Internet Plus Nursing Service” ( $P > 0.05$ ). Experience of community activities or a part-time job, elderly care experience, choice of nursing profession, satisfaction with nursing profession, willingness to engage in nursing work after graduation, and willingness to engage in elder care work were significantly associated with the willingness of nursing students to participate in “Internet Plus Nursing Service” ( $P < 0.05$ ).

**Conclusion:** Students had a positive attitude towards “Internet Plus Nursing Service” and were willing to choose “Internet Plus Nursing Service” as their future career choice. However, they lacked the willingness to engage in elder care after graduation. School education should strengthen the nursing education of elder care, develop a diversified nursing service model and professional training programs that meet social demands and professional needs, as well as address the opportunities and challenges of the Internet era.

## Background

In the last decade, the trend of aging population in China has become increasingly apparent. By the end of 2018, there were 249 million people aged 60 or over, accounting for 17.9% of the total population. Among them, the number of older persons with chronic diseases was about 150 million and the disabled or semi-disabled elderly population numbered approximately 44 million.<sup>1</sup> The impact of disease spectrum change, the aging process, and an elderly home care-based traditional concept has led to an increased demand for long-term care and home health care services.<sup>2</sup> Meeting this demand has been difficult due to the lack of nurses, and has therefore become an urgent problem within the current Chinese medical industry.<sup>3</sup> To address the challenge, the Chinese government implemented a pilot project of “Internet Plus

Nursing Service” in six provinces and cities from February to December, 2019. “Internet Plus Nursing Service” provides chronic disease management, rehabilitation nursing, health education, hospice care and other nursing services for older patients with mobility difficulties. It utilizes information technology systems, adopting an “online application and offline services” approach. “Internet Plus Nursing Service” focuses on serving medical institutions and requires nurses to be registered with a medical institution and have at least five years of clinical nursing experience. To ensure the quality of nursing services and the safety of nursing staff and patients, medical institutions connected with “Internet Plus Nursing Service” first assess the diseases, health needs and other conditions of patients, then send nurses with corresponding qualifications and technical capabilities to provide the relevant services. Through the effective connection between online and offline nursing, “Internet Plus Nursing Service” expands the model of integrated nursing services, enhances the coordination between the home, community, hospital, and nursing institution”, and highlights the important role of nursing staff in patient management, health education and disease prevention.

Although undergraduate nursing students are not the only important forces to cope with social aging and rebuild the image of the public health system, they are the main group that would work with “Internet Plus Nursing Service”.<sup>4</sup> Thus, their attitude, willingness and motivation towards “Internet Plus Nursing Service” are worthy of respect and in-depth research. This study aims to investigate the attitude of third-year undergraduate nursing students towards “Internet Plus Nursing Service” and the influencing factors, providing a reference for the long-term development of “Internet Plus Nursing Service” within nursing professional education.

## **Methods**

### **Participants**

From March to April 2019, this study used cluster sampling, which included 510 third-year undergraduate nursing students from 11 classes at a nursing school in the University of Traditional Chinese Medicine, Northern China, which offers a four-year undergraduate nursing education program, including three years of theoretical study and one year of clinical practice. The study participants were full-time students willing to participate in the study and competent in providing informed consent. Participants who were seriously ill during data collection were excluded.

### **Preparation before Survey**

To ensure that nursing students fully understood “Internet Plus Nursing Service”, they were instructed to study the subject in class, including its concept, generation background, management system, service model, service specifications and operating mechanism. They also consulted literature on the topic of “Internet Plus Nursing Service” prior to completing a paper related to the topic.

### **Survey Tools**

The self-designed survey was divided into two parts. The first part contained the basic information of nursing students, including gender, whether only child or not, home location. The second part investigated nursing students' attitudes, willingness, and motivations for "Internet Plus Nursing Service". Semi-structured interviews were conducted with 20 third-year nursing students, and 10 nursing teachers, as well as five nurses and three nursing managers from hospitals contracted to provide "Internet Plus Nursing Service", and combined with literature to form a pre-survey. After the completion of the pre-survey (n=20), the final survey was formed through two rounds of examination and revision by four experts. The survey asked students a total of nine questions: (1) whether they had experience with community activities or a part-time job, (2) whether they had experience with elder care, (3) their willingness to choose a nursing profession; (4) their satisfaction with the nursing profession; (5) their willingness to engage in nursing care after graduation, (6) their willingness to engage in nursing for elderly patients after graduation, (7) the knowledge and skills required for elder care; (8) whether they would accept "Internet Plus Nursing Service" as a future career choice, and (9) their motivation of accepting/not accepting "Internet Plus Nursing Service" as their career choice. Questions 1-6 and 8 were single-choice questions, while 7 and 9 were fill-in-the-blank questions requiring no less than four items to be filled in to ensure the completeness of the investigation. According to the assessment of experts, the questionnaire has good content validity and the *Cronbach's* alpha was 0.712, which is considered acceptable.

## **Data Collection**

The survey link was generated from "Questionnaire Star," which is a Chinese online survey platform. The nursing students independently and anonymously completed the survey without the impacts of other factors to ensure the expression of their true willingness. The survey was considered valid if every question was answered.

## **Statistical Analysis**

The researchers downloaded the raw data through "Questionnaire Star," and analysed the data using "Questionnaire Star" software and SPSS version 22.0 software. The statistical description of nursing students' general data and answers for each item were expressed in the form of mean, standard deviation (SD), frequency, and percentage. The willingness of nursing students with different characteristics to "Internet Plus Nursing Service" was compared using chi-square test. Pearson's chi-square test was used to make comparison among groups. The data that failed to meet the conditions of Pearson's chi-square test were processed with Fisher exact test with  $\alpha=0.05$  as the test standard.

# **Results**

## **Related Data of Nursing Students Participating in the Survey**

A total of 510 nursing students completed the surveys through the "Questionnaire Star" platform. Two unqualified surveys with ambiguous expressions were excluded. Finally, 508 valid surveys were collected and analysed. The percentage of valid survey collection was 99.61%. The mean age of 508 nursing

students was  $21.25 \pm 0.91$  years. The related data of nursing students who participated in the survey are shown in Table 1.

### **Attitude of Nursing Students towards “Internet Plus Nursing Service” Project**

Of these 508 nursing students, 314 (61.81%) expressed support for the implementation of “Internet Plus Nursing Service,” 150 (29.52%) remained neutral and 44 (8.66%) expressed disapproval.

### **Willingness and Motivation of Nursing Students on “Internet Plus Nursing Service”**

Of these 508 nursing students, 279 (54.92%) were willing to choose “Internet Plus Nursing Service” as their future career choice, 51 (10.04%) were unwilling, and 178 were unsure. The motivation of nursing students’ willingness or unwillingness to choose “Internet Plus Nursing Service” as their future career choice or not is shown in Tables 2 and 3.

### **Comparison of the Willingness of Nursing Students with Different Characteristics to Participate in “Internet Plus Nursing Service”**

Gender, whether an only child or not, home location, and degree of knowledge and skills required for elderly care were not significantly associated with the willingness of nursing students to participate in “Internet Plus Nursing Service” ( $P > 0.05$ ). Experience of community activities or part-time job, experience of elderly care, choice of nursing profession, satisfaction with nursing profession, willingness to engage in nursing work after graduation and willingness to engage in elder care work were significantly associated with the willingness of nursing students to participate in “Internet Plus Nursing Service” ( $P < 0.05$ ); data for this are shown in Table 4.

## **Discussion**

### **More than fifty percent of nursing students hold a positive attitude toward “Internet Plus Nursing Service”**

The nursing students participating in this survey are from generations that have grown up with the Internet, and who are not only familiar with but prefer “Internet plus.” More than half of nursing students expressed support for the implementation of the “Internet Plus Nursing Service” project, and they were willing to choose it as their future career choice. These nursing students believed that “Internet Plus Nursing Service” could break the limitations of hospital services and extend the nursing service to the family; thereby meeting the patient’s needs for home health care and alleviating the problem of nursing shortages in the hospitals. Moreover, nurses could increase their income by making use of “Internet Plus Nursing Service” in their spare time, thereby enhancing their personal value.<sup>5-7</sup> Nursing students recognized that “Internet Plus Nursing Service” is full of opportunities. In addition, nursing students expressed that satisfying the service needs of patients was the motive for their career choice, which highlighted the professional spirit and responsibility of young nurses, and aligned with the vision of “Internet Plus Nursing Service”, making use of Internet technology to effectively expand, extend, and

operate a variety of medical resources. However, about one-third of nursing students still held a neutral or unsupportive attitude toward “Internet Plus Nursing Service.” The home and school education they received made them identify with nursing within hospital. Therefore, in their views, medical institutions are important components of their professional safety. Their inherent cognition makes them sceptical about “practice outside the hospital” and their capacities to be qualified for nursing work outside the medical institutions. That school education must remain sensitive and concerned about the changes in social development and enhance the cognition of nursing students on “Internet Plus Nursing Service.”

In addition, nursing students with the experience of community activities or part-time jobs were more willing to accept the concept of “Internet Plus Nursing Service.” Team occupational activities are beneficial for developing the emotional intelligence of nursing students and facilitating the formation of a positive professional identity. Additionally, associations and part-time experiences shape their willingness to serve others. Therefore, nursing education should create a supportive environment for nursing students when nursing service ushers in the era of “Internet Plus”. Furthermore, it should encourage nursing students to actively participate in community activities as well as extracurricular practice activities, and consciously cultivate their professional ethics, attitudes, and style, along with other qualities such as communication skills, cultural sensitivity, interdisciplinary cooperation capacity, responsibility, professional dedication, team awareness, and professional integrity. It should also encourage them to keep good psychological as well as physical qualities and enhance their ability to cope with stress and frustration.<sup>8-10</sup>

### **Pay Attention to the Professional Loyalty and Career Planning**

The survey shows *that 61.42% of the nursing students did not* willingly choose the nursing profession. For those students, the choice was based on their parents' wishes or influenced by their college major. In addition, nearly half of the students were unclear whether they would engage in nursing care after graduation. Nursing *students'* identification degree to nursing profession was not high. They also felt confused about being a clinical nurse in the future. Thus, we should pay attention to the professional loyalty of nursing students firstly prior to investigating whether nursing students could accept “Internet Plus Nursing Service.”<sup>11</sup> School education should pay attention to the emotions and attitudes of nursing students beginning at enrolment, thereby helping these students make good career choices based on correct understanding of themselves and the relevant environment. Projects such as alumni association and career development forum could help nursing students face their career choices rationally to avoid wasting of human resource.<sup>12,13</sup>

### **Strengthen the Nursing Education of Elderly Care and Arouse the Interest of Nursing Students in Elderly Care**

The key service focus of “Internet Plus Nursing Service” is the elderly or disabled/semi-disabled elderly population. Considering the physiological and psychological specificity of the above population, professional geriatric nurses are urgently needed to meet their health needs.<sup>14</sup> The survey suggested that

nursing students did not master the knowledge and skills required for elderly care sufficiently, and they lacked confidence in caring for the disabled/semi-disabled elderly population. Additionally, they lacked the willingness to engage in elderly care after graduation.

Elderly care education is also limited in the insufficient courses in the school of nursing. Poor practice results in fewer opportunities for nursing students to understand older persons at a close distance.<sup>15</sup> Many nursing students pay inadequate attention to the courses in elderly care due to the lack of corresponding professional examinations. Only a minority of undergraduate nursing students are willing to engage in elderly care.<sup>16</sup> The related knowledge and skills on elder care are included in the category of registered nurse examination in USA, elderly care practicing certificate is set, nurse's practice on elderly care is encouraged and student's study on elderly care course is strengthened in order to promote the development of elderly care.<sup>17</sup>

The nursing students with experience of elderly care were more willing to engage in elderly care than those without experience of elderly care. Thus, an elderly care education program that combines theory, experiment, and practice into nursing education needs to be developed. A practical training base of elderly care should be built for professional practice experience. The awareness of nursing students on nursing profession, life, and elderly should be strengthened to arouse their responsibility and nursing professional emotions and accurately meet the diversified and differentiated health needs of elderly patients. In a systemic evaluation on medical students' attitude intervention study towards the elderly.<sup>18,19</sup> Samra et al.<sup>20</sup> proposed to add empathy building into elderly care courses and encouraged students to have direct contact with the older patients to listen to their stories. Fisher and Walker<sup>21</sup> made the students feel the situation of their old age through simulation-based teaching, where the elderly were taken as themselves, thereby increasing the students' awareness of the elderly population and improving their attitudes towards older persons.

### **Safety and Salary of "Internet Plus Nursing Service" Key issues for Nursing Students**

This survey showed that safety concern was the main reason to block students from accepting "Internet Plus Nursing Service" as their career choice. The personal safety issue in the case of going to an unfamiliar environment to provide home nursing services is one part of the safety concern mentioned above. "Nobody knows what kind of person the patients and families behind the door belong to. It's full of unknown and risks." The nursing students were also worried about the medical security for themselves and patients in the case of providing out-of-hospital care service for high-risk population such as the elderly or disabled people. Any nursing procedure is not absolutely smooth and safe. Medical teams and equipment support could act as strong backing in a hospital if it encounters a tricky problem. However, how to deal with the possible thorny problem when provide out-of-hospital nursing service?" Nursing Students were interested in the added income from "Internet Plus Nursing Service," and they regarded it as a crucial problem as it fully reflected the personal value of nurses and met the requirement for high income. Most nursing students believed that "the nursing work was very hard. If the salary obtained was

not satisfactory after spending the rest time in part-time job, the participation enthusiasm of nurses would be affected.”

The government should pay attention to the concerns of nursing students and reinforce the service procedure and salary managements of “Internet Plus Nursing Service.” School education should also strengthen the practice of safety education for nursing students and training for professional knowledge and skills to enhance their abilities to withstand risks.<sup>22,23</sup>

## Conclusions

“Internet Plus Nursing Service” is the in-depth integration and application of “Internet plus” and Nursing fields, which enriches the connotation of nursing, expands the field of nurse practice, and achieves healthy aging from a scientific perspective. School education should develop a diversified nursing service model, formulate a training program for the nursing profession according to social and professional needs, and further improve the quality of personnel training that addresses social and economic development, thereby meeting the opportunities and challenges brought on by the Internet era.

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## Declarations

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Declarations:

### Authors' contributions

HZ was a major contributor in writing the manuscript. The questionnaire was designed by HZ, PZ and YNW. PZ and YNW helped acquire the data. HZ and PZ helped analyse the statistic and interpret the data. All authors read and approved the submitted version of the manuscript.

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### Ethics approval and consent to participate

Prior to obtain the data, students were briefed about the purpose of the study. Shanxi University of Chinese Medicine ethics committee approved this study, and all nursing students volunteered to participate in this survey and signed the informed consent.

### Consent for publication

Not applicable.

### Competing interests

The authors have no conflicts of interest to declare.

## Tables

Variable	n (%)	Variable	n (%)
Gender		Only child	
Female	463 [91.14]	Yes	89 [17.52]
Male	45 [8.86]	No	419 [82.48]
Home location		Experience of community activities or part-time job	
Countryside	413 [81.30]	Yes	257 [50.59]
Town	95 [18.70]	No	251 [49.41]
Experience of elderly care		Choice of nursing profession	
Yes	212 [41.73]	Voluntary	196 [38.58]
No	296 [58.27]	Non-voluntary	312 [61.42]
Willingness to engage in nursing care after graduation		Knowledge and skills required for elderly care	
Willing	255 [50.20]	Completely know	83 [16.34]

Unwilling	29 [5.71]	Partially know	314 [61.81]
Unclear	224 [44.09]	Not know	111 [21.85]
Satisfaction with nursing profession		Willingness to engage in elderly nursing care after graduation	
Very dissatisfied	20 [3.94]	Willing	263 [51.77]
Dissatisfied	75 [14.76]	Unwilling	88 [17.32]
Basically satisfied	401 [78.94]	Unclear	157 [30.91]
Very satisfied	12 [2.36]		

Table 1  
Demographic Characteristics and Measured Variables of the Participants (*n=508*)

Variable	n	%
Added income	401	87.75
High autonomy and flexibility	367	80.31
Good job prospects	322	70.46
Meeting the needs of the service object	282	61.71
Self-improvement	274	59.96

Table 2  
The motivation of nursing students' willingness to choose "Internet plus

Variable	n	%
Safety concern	192	83.84
<i>Lack of time and energy</i>	167	72.93
Unwilling elderly care	135	58.95
Unwilling nursing	87	37.99
Worrying about not qualified for this	73	31.88

Table 3  
The motivation of nursing students' unwillingness to choose "Internet plus Nursing Service" as their future career choice [n = 229]

Variable	n( %)	Willing n( %)	Unwilling n( %)	Unclear( %)	X <sup>2</sup>	P
Gender					2.092	0.337
Female	463 [91.14]	255 (55.08)	49 (10.58)	159 (34.34)		
Male	45 [8.86]	24 (53.33)	2 (4.44)	19 (42.22)		
Only child					1.306	0.520
Yes	89 [17.52]	51 (57.30)	6 (6.74)	32 (35.96)		
No	419 [82.48]	228 (54.42)	45 (10.74)	146 (34.84)		
Home location					1.614	0.446
Countryside	413 [81.30]	224 (54.24)	39 (9.44)	150 (36.32)		
Town	95 [18.70]	54 (56.84)	12 (12.63)	29 (30.53)		
Experience of					106.256	0.000

community activities or part-time job					
Yes	257 [50.59]	199 (77.43)	5 (1.95)	53 (20.62)	
No	251 [49.41]	83 (33.07)	41 (16.33)	127 (50.60)	
Experience of elderly care					14.132    0.001
Yes	212 [41.73]	137 (64.62)	15 (7.08)	60 (28.30)	
No	296 [58.27]	142 (47.97)	36 (12.16)	118 (39.86)	
Knowledge and skills required for elderly care					20.665    0.300
Completely know	83 [16.34]	35 [42.17]	5 (6.02)	43 (51.81)	
Partially know	314 [61.81]	81 [25.80]	85 (27.07)	148 (47.13)	
Not know	111 [21.85]	38 [34.23]	28	45	

			(25.23)	(40.54)		
Choice of nursing profession					25.347	0.000
Voluntary	196 [38.58]	127 (64.80)	20 (10.20)	49 (25.00)		
Non-voluntary	312 [61.42]	165 (52.88)	57 (18.27)	90 (28.85)		
Satisfaction with nursing profession					36.775	0.000
Very dissatisfied	20 [3.94]	7 [35.00]	1 (5.00)	12 (60.00)		
Dissatisfied	75 [14.76]	21 [28.00]	20 (26.67)	34 (45.33)		
Basically satisfied	401 [78.94]	231 [57.61]	35 (8.73)	135 (33.67)		
Very satisfied	12 [2.36]	10 [83.33]	0 [0]	2 (16.67)		
Willingness to engage in nursing care after graduation					72.909	0.000

Willing	255 [50.20]	180 (70.59)	22 (8.63)	53 (20.78)		
Unwilling	29 [5.71]	8 (27.59)	10 (34.48)	11 (37.93)		
Unclear	224 [44.09]	91 (40.63)	19 (8.48)	114 (50.89)		
Willingness to engage in elderly nursing care after graduation					52.010	0.000
Willing	263 [51.77]	188 (71.48)	12 (4.56)	63 (23.95)		
Unwilling	88 [17.32]	37 (42.05)	24 (27.27)	27 (30.68)		
Unclear	157 [30.91]	54 (34.39)	15 (9.55)	88 (56.05)		

Table 4

Comparison of the willingness of nursing students with different characteristics to participate in "Internet plus Nursing Service" [n = 508]