Research Paper

Investigation and influencing factors of the behavioral intention of nurses voluntarily participating in the care of older adults with disabilities

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ABSTRACT

Objectives: This study aimed to analyze nurses' intention and influencing factors to participate in voluntary care services for older adults with disabilities, and build a structural equation model to clarify the influence of behavioral attitude, subjective norms, and perceived behavioral control on the behavioral intention, to lay the foundation for establishing voluntary care teams for older adults with disabilities.

Methods: This cross-sectional study was conducted in 30 hospitals of different levels from August to November 2020. Participants were selected by convenience sampling. A self-designed questionnaire was used to survey nurses to investigate their intention to participate in voluntary care services for older adults with disabilities, including four dimensions: behavioral intention (three items), behavioral attitude (seven items), subjective norms (eight items), and perceived behavioral control (eight items), a total of 26 items. Logistic regression was used to analyze the influence of general information on behavioral intention. Smart PLS 3.0 software was used to build the structural equation model, and the influence of behavioral attitude, subjective norms, and perceived behavioral control on behavioral intention was analyzed.

Results: A total of 1,998 nurses were enrolled, 1,191 (59.6%) were willing to participate in volunteer care for older adults with disabilities, and the willingness of nurses to participate in volunteer care for older adults with disabilities was above the medium level. The scores of behavioral attitude, subjective norm, perceived behavioral control, and behavioral intention dimension were 26.31 ± 5.94, 30.93 ± 6.62, 27.58 ± 6.70, and 10.78 ± 2.50, respectively. Logistic regression analysis showed that the nurses who had urban household registration, held a management positions in the department, received free help from other volunteers, and was rewarded by hospitals or organizations for voluntary activities were more willing to participate ($P < 0.05$). The partial least squares analysis showed that behavioral attitudes ($\beta = 0.456$, $P < 0.001$), subjective norms ($\beta = 0.167$, $P < 0.01$), and perceived behavioral control ($\beta = 0.123$, $P < 0.01$) had a significant positive impact on behavioral intention. The more positive the attitude, the more support, the fewer the obstacles, and the greater the intention of the nurses to participate.

Conclusion: Mobilizing nurses to volunteer care for older adults with disabilities is feasible in the future. Therefore, policymakers and leaders need to improve relevant laws and regulations to ensure the safety of volunteers, reduce the external hindrance factors of volunteer activities, pay attention to the cultivation of nursing staff values, identify the internal needs of nursing staff and improve incentive measures, to improve the willingness of nursing staff to participate and transform it into practical action.

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What is known?

- The number of older adults with disabilities has increased, and medical care needs are not being met.
- Many nursing students and practitioners do not want to work full-time in geriatric care.

What is new?

- The volunteer mode of nurses serving as volunteers might effectively alleviate the current situation in which the needs of older adults with disabilities cannot be met.
- Nurses' intention to participate in voluntary care services for older adults with disabilities is above moderate, indicating that this approach is feasible in the future.
- The more positive the attitude, the more support, the fewer the obstacles, and the higher the participation intention to voluntary care services of nurses is.

1. Introduction

Population aging is a hot topic of global concern. It is predicted that by 2030, the population aged over 65 years in the United States will reach 69.4 million, accounting for 20% of the total population, while those over 85 years will be the fastest-growing group. By 2060, the number of older adults needing long-term care will reach 14–24 million [1,2]. Japan is a super-aging country, with 27.7% of its population aged 60 years or older in 2017 [3]. According to data released by the National Health Commission, there were approximately 40 million disabled or partially disabled older adults in China by the end of 2018, and the number of older adults with disabilities is expected to reach 97.5 million by 2050, gradually imposing a heavy burden on older adult care [4]. Moreover, older adults with disabilities have a high demand for healthcare [5]. They live in family-based, community-supported, and institutionally supported older adult care systems, with no additional care systems being established. In families, caregivers are under great emotional and financial pressure; in the community, the services provided are relatively homogeneous and unable to meet the diversified needs of older adults; in older adult care institutions, there is a serious shortage of nurses, a low number and quality of older adult care workers, a high turnover rate of registered nurses, and expensive services [6]. The conflict between the growing number of older adults with disabilities and the insufficient number of caregivers is becoming increasingly prominent. The time-bank model was introduced to solve the older adult care dilemma in China. However, this practice has drawbacks, such as monotonous incentive mechanisms, unclear exchange mechanisms, and high volunteer turnover [7].

In summary, the number of older adults with disabilities in China is increasing, and the demand for medical care is high. Existing models in China and overseas time-banking models cannot effectively solve the problem of professional medical care personnel shortage. Establishing a team of nurse volunteers to provide care for older adults with disabilities can fill this gap effectively. This study investigated nurses' intention to participate in voluntary care services for older adults with disabilities and its influencing factors based on the theory of planned behavior.

Ajzen [8] proposed the theory of planned behavior (Fig. 1) based on the rational behavior theory, which includes four dimensions: behavioral intention, behavioral attitude, subjective norms, and perceived behavioral control. The theory of planned behavior can predict and explain individual behavior, whereas behavioral

intention represents the premise of behavior. It is believed that the more positive the attitude towards a certain behavior, the greater the perceived social support and control over the behavior and the more likely an individual will adopt a certain behavior. Behavioral intention refers to the disposition of thoughts and the motivation to act before taking action. Currently, it is widely used in various fields, such as health education and volunteering [9,10]. Under the guidance of the theory of planned behavior, this study aimed to explore the influence of behavioral attitude, subjective norms, and perceived behavioral control on behavioral intention, construct a behavioral intention model for nurses participating in voluntary care services for older adults with disabilities, and analyze the relationship between the dimensions. The following hypotheses were proposed: 1) behavioral attitude has a direct positive impact on behavioral intention; 2) subjective norms have a direct positive impact on behavioral intention; 3) perceived behavioral control has a direct positive impact on behavioral intention.

This study aimed to investigate and analyze the behavioral intentions of nurses and their influencing factors to lay a theoretical foundation for the construction of nursing volunteer teams. The following questions guided this study: a) What is the intention of the nurse to participate in voluntary care services for older adults with disabilities? b) What factors influence the intention to participate?

2. Methods

2.1. Study design and participants

This study used a cross-sectional design. Nurses were recruited from all hospital levels in Suzhou, China, using a convenience sampling method. The final sample included 30 hospitals at all levels, including five tertiary hospitals, five secondary hospitals, and 20 primary community hospitals. The inclusion criteria for the study sample were: 1) informed consent and voluntary participation in the study and 2) on-the-job nurses with a nationally recognized nursing practice license. The exclusion criteria were: 1) nursing students; 2) nurses on leave or being sent for further study, and 3) nurses suffering from serious physical or mental illnesses. This study report follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).

2.2. Instruments

2.2.1. General information questionnaire

Relevant socio-demographic details were self-reported, including 1) sex, age, professional title, marital status, number of children, nurse level, etc. and 2) their engagement in volunteer activities.

2.2.2. Questionnaire on the behavioral intention of nurses voluntarily participating in the care of older adults with disabilities

The behavioral intention questionnaire for nurses to participate in voluntary care services for older adults with disabilities, including four dimensions: behavioral intention (three items), behavioral attitude (seven items), subjective norms (eight items), and perceived behavioral control (eight items), a total of 26 items. Each item is rated on a 5-point Likert scale from "strongly disagree" to "strongly agree." The possible scores ranged from 3 to 15 for behavioral intention, 7 to 35 for behavioral attitude, and 8 to 40 for subjective norms and perceived behavioral control. The higher the mean score of the variable, the higher the behavioral intention, behavioral attitude, subjective norms, and perceived behavioral control scores are. To investigate nurses' willingness to participate more conveniently and intuitively, the five-point scale of behavioral
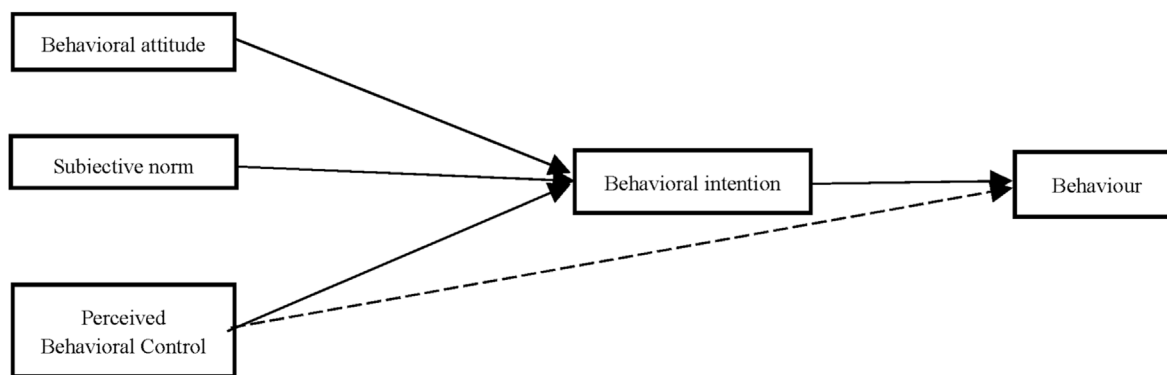
Fig. 1. Theory of planned behavior (Ajzen, 1991).

intention was converted into the two-point scale of "willing" and "unwilling" in the univariate analysis and logistic regression analysis of this study. However, the five-point scale was still used in the later construction of the structural equation model. The Cronbach's α coefficient of the total questionnaire was 0.977, and the content validity index (CVI) values for each item in the questionnaire ranged from 0.88 to 1.00, while scale-level CVI (S-CVI) reached 0.971, indicating that this questionnaire had good reliability and validity [11].

2.3. Ethical considerations

This study was approved by the Ethics Committee of the First Affiliated Hospital of Soochow University, Suzhou, China (No. 2020-002). The survey process was explained to participants before the survey. Participants were given information sheets detailing the study objectives, procedures, inclusion and exclusion criteria, and survey duration. All participants provided written informed consent and were assured anonymity and confidentiality. They were also informed that participation was voluntary and that they could withdraw at any time during the survey.

2.4. Data collection

Data were collected between August and November 2020. Before the survey, the researchers contacted the management of each hospital to provide details about the study and ethical approval. A combination of paper and online electronic questionnaires was used. Uniform instructions were used to explain the study's purpose, significance, and confidentiality principles to the participants. Informed consent was obtained before data could be collected. The online questionnaire was explained, including the research introduction, inclusion criteria, and questionnaire links, and was completed anonymously. Each mobile terminal setting can be entered only once. Reverse and compulsory questions were used to ensure the quality and integrity of the questionnaire. After retrieving the questionnaire, the researcher downloaded it and eliminated invalid questionnaires, such as those with the same answer for all options. Each questionnaire took 5–10 min to complete.

2.5. Statistical analysis

Statistical analyses were performed using SPSS 23.0 and smart partial least squares (PLS) 3.0. Descriptive statistics were used to calculate the frequency and percentage of data. The chi-square and rank sum tests were used to compare the behavioral intention of nurses with different characteristics. Logistic regression models were used to analyze influencing factors, and Pearson's correlation analysis was used to determine the correlation between various questionnaire dimensions. Smart PLS software (version 3.0) was used for structural equation model analysis. Structural equation modeling (SEM) is necessary to validate the relationship between tools and test structures. It can also identify, estimate, and validate causal models. SEM can be divided into two types: one based on covariance, such as Linear Structural Relationships (LISREL) and Analysis of Moment Structure (AMOS), and the other based on variance, the most representative of which is PLS path modeling [12]. PLS combines principal component and multiple regression analysis and can be used for theoretical validation and development. Although less widely used than the first type, PLS is unique in that it requires fewer samples, does not require data to conform to a normal distribution, can process both reflective and formative indicators, is not affected by multiple collinearities, and has strong predictive power. It is also widely used in management, economics, health behavior, and other fields, and some scholars have applied it to extend and test the theory of planned behavior [13]. Each endogenous latent variable had a path coefficient (R^2) that tested the fit of the model. When R^2 was >0.67, the model had strong explanatory power; when R^2 was approximately 0.33, the model had moderate explanatory power; and when R^2 was <0.19, the explanatory power was weak.

3. Results

3.1. Demographics of the participants

A total of 2,100 nurses participated in the study, and 1,988 completed questionnaires were retrieved, with an effective response rate of 95.14%. The socio-demographic characteristics of the nurses and their participation in volunteer work are presented in Table 1. Of the participants, 96.9% ($n = 1,937$) were female, 17.4% ($n = 347$) worked in primary hospitals, 51.6% ($n = 1,031$) in secondary hospitals, 31% ($n = 620$) in tertiary hospitals, 50.1% ($n = 1,001$) had participated in volunteer activities.

3.2. The score of the questionnaire on the behavioral intention of nurses voluntarily participating in the care of older adults with disabilities

59.6% of nurses were willing to participate in volunteer care for older adults with disabilities, and the willingness of nurses was above the medium level. The mean total score of the questionnaire including behavioral intention, behavioral attitude, subjective norms, and perceived behavioral control score were 10.78 ± 2.50, 26.31 ± 5.94, 30.93 ± 6.62, 27.58 ± 6.70, respectively.

Table 1
Comparison of the willingness of nurses with different characteristics to voluntarily participate in caring for older adults with disabilities ($n = 1,998$).

Variables	n (%)	Willing, n (%)	Unwilling, n (%)	χ^2/Z	P
Sex					
Male	61 (3.1)	31 (50.8)	30 (49.2)	−1.14[a]	0.254
Female	1,937 (96.9)	1,160 (59.9)	777 (40.1)		
Age					
18−24	254 (12.7)	149 (58.7)	105 (41.3)	23.59[b]	<0.001
25−30	704 (35.2)	375 (53.3)	329 (46.7)		
31−40	789 (39.5)	505 (64.0)	284 (36.0)		
41−50	211 (10.6)	141 (66.8)	70 (33.2)		
≥ 51	40 (2.0)	21 (52.5)	19 (47.5)		
Household registration					
Urban	1,252 (62.7)	773 (61.7)	479 (38.3)	6.33[b]	0.012
Rural	746 (37.3)	418 (56.0)	328 (44.0)		
Only child					
No	1,005 (50.3)	622 (61.9)	383 (38.1)	4.37[b]	0.037
Yes	993 (49.7)	569 (57.3)	424 (42.7)		
Religious belief					
No	1,855 (92.8)	1,110 (59.8)	745 (40.2)	−0.62[a]	0.535
Yes	143 (7.2)	81 (56.6)	62 (43.4)		
Marital status					
Unmarried	497 (24.9)	275 (55.3)	222 (44.7)	1.02[a]	0.795
Married	1,455 (72.8)	890 (61.2)	565 (38.8)		
Divorced	40 (2.0)	22 (55.0)	18 (45.0)		
Widowed	6 (0.3)	4 (66.7)	2 (33.3)		
Number of children					
0	641 (32.1)	357 (55.7)	284 (44.3)	8.18[b]	0.042
1	903 (45.2)	543 (60.1)	360 (39.9)		
2	450 (22.5)	288 (64.0)	162 (36.0)		
≥ 3	4 (0.2)	3 (75.0)	1 (25.0)		
Are there any older adults in your family?					
No	258 (12.9)	145 (56.2)	113 (43.8)	−1.30[a]	0.193
Yes	1,740 (87.1)	1,046 (60.1)	694 (39.9)		
How is your relationship with the older adults in your family?					
Very distant	10 (0.5)	5 (50.0)	5 (50.0)	48.36[b]	<0.001
Distant	8 (0.4)	4 (50.0)	4 (50.0)		
General	342 (17.1)	148 (43.3)	194 (56.7)		
Close	1,083 (54.2)	671 (62.0)	412 (38.0)		
Very close	555 (27.8)	372 (67.0)	183 (32.9)		
Grade of hospital					
Primary	347 (17.4)	196 (56.5)	151 (43.5)	3.39[a]	0.183
Secondary	1,031 (51.6)	640 (62.1)	391 (37.9)		
Tertiary	620 (31.0)	355 (57.3)	265 (42.7)		
Department					
Medical	556 (27.8)	320 (57.6)	236 (42.4)	28.13[b]	0.009
Surgical	287 (14.4)	186 (64.8)	101 (35.2)		
Gynecology and obstetrics	179 (9.0)	114 (63.7)	65 (36.3)		
Pediatrics	58 (2.9)	27 (46.6)	31 (53.4)		
Emergency	148 (7.4)	72 (48.6)	76 (51.4)		
ICU	50 (2.5)	33 (66.0)	17 (34.0)		
Psychiatry	45 (2.3)	31 (68.9)	14 (31.1)		
Outpatient	148 (7.4)	78 (52.7)	70 (47.3)		
Rehabilitation	94 (4.7)	62 (66.0)	32 (34.0)		
Operating room	83 (4.2)	54 (65.1)	29 (34.9)		
Departments of community hospital	317 (15.9)	191 (60.3)	126 (39.7)		
Nursing department	11 (0.6)	8 (72.7)	3 (27.3)		
Transfusion center	11 (0.6)	6 (54.5)	5 (45.5)		
Others	11 (0.6)	9 (81.8)	2 (18.2)		
Professional title					
Junior	1,218 (61.0)	685 (56.2)	533 (43.8)	27.30[b]	<0.001
Intermediate	636 (31.8)	393 (61.8)	243 (38.2)		
Senior	144 (7.2)	113 (78.5)	31 (21.5)		
Professional qualification					
N0	207 (10.4)	111 (53.6)	96 (46.4)	31.93[b]	<0.001
N1	449 (22.5)	255 (56.8)	194 (43.2)		
N2	706 (35.3)	399 (56.5)	307 (43.5)		
N3	492 (24.6)	313 (63.6)	179 (36.4)		
≥ N4	144 (7.2)	113 (78.5)	31 (21.5)		
Years of nursing experience					
≤ 5	528 (26.4)	301 (57.0)	227 (43.0)	17.20[b]	0.002
6−10	621 (31.1)	341 (54.9)	280 (45.1)		
11−15	444 (22.2)	281 (63.3)	163 (36.7)		
16−20	191 (9.6)	129 (67.5)	62 (32.5)		

Table 1 (continued)

Variables	n (%)	Willing, n (%)	Unwilling, n (%)	χ^2/Z	P
≥ 21	214 (10.7)	139 (65.0)	75 (35.0)		
Monthly income (CNY)					
≤ 4,000	174 (8.7)	98 (56.3)	76 (43.7)	12.68[b]	0.005
4,001−6,000	619 (31.0)	337 (54.4)	282 (45.6)		
6,001−8,000	695 (34.8)	433 (62.3)	262 (37.7)		
≥ 8,001	510 (25.5)	323 (63.3)	187 (36.7)		
Number of night shifts per month					
0	498 (24.9)	294 (59.0)	204 (41.0)	13.29[b]	0.004
1−4	855 (42.8)	545 (63.7)	310 (36.3)		
5−9	567 (28.4)	307 (54.1)	260 (45.9)		
≥ 10	78 (3.9)	45 (57.7)	33 (42.3)		
Holding a management position					
No	1,292 (64.7)	708 (54.8)	584 (45.2)	35.15[b]	<0.001
Yes	706 (35.3)	483 (68.4)	223 (31.6)		
Work pressure in the past 6 months					
Very high	260 (13.0)	127 (48.8)	133 (51.2)	21.68[b]	<0.001
Relatively high	811 (40.6)	475 (58.6)	336 (41.4)		
General	860 (43.0)	540 (62.8)	320 (37.2)		
Lower	54 (2.7)	40 (74.1)	14 (25.9)		
Very low	13 (0.7)	9 (69.2)	4 (30.8)		
Physical condition in the past 6 months					
Very poor	82 (4.1)	33 (40.2)	49 (59.8)	69.99[b]	<0.001
Relatively poor	402 (20.1)	209 (52.0)	193 (48.0)		
Moderate	1,111 (55.6)	642 (57.8)	469 (42.2)		
Relatively good	347 (17.4)	265 (76.4)	82 (23.6)		
Very good	56 (2.8)	42 (75.0)	14 (25.0)		
Have you received any training in elderly care?					
No	1,360 (68.1)	746 (54.9)	614 (45.1)	40.02[b]	<0.001
Yes	638 (31.9)	445 (69.7)	193 (30.3)		
Have you received any unpaid help from other volunteers?					
No	1,368 (68.5)	719 (52.6)	649 (47.4)	89.58[b]	<0.001
Yes	630 (31.5)	472 (74.9)	158 (25.1)		
Have you ever been involved in volunteer activities?					
No	1,001 (50.1)	489 (48.9)	512 (51.1)	96.54[b]	<0.001
Yes	997 (49.9)	702 (70.4)	295 (29.6)		
How often do you volunteer?					
1 time/year	194 (9.7)	134 (69.1)	60 (30.9)	107.91[a]	0.015
2 times/year	280 (14.0)	212 (75.7)	68 (24.3)		
1 time/month	128 (6.4)	108 (84.4)	20 (15.6)		
1 time/week	14 (0.7)	14 (100.0)	0 (0.0)		
>1 time/week	20 (1.0)	12 (60.0)	8 (40.0)		
No fixed frequency	1,362 (68.2)	926 (68.0)	436 (32.0)		
Have you ever volunteered to help older adults with disabilities?					
No	1,475 (73.8)	990 (67.1)	485 (32.9)	109.09[a]	<0.001
Yes	523 (26.2)	417 (79.7)	106 (20.3)		
Have you ever received recognition (or awards) from a hospital or charity organization for your volunteer work?					
No	1,727 (86.5)	1,180 (68.3)	547 (31.7)	107.90[a]	<0.001
Yes	271 (13.5)	227 (83.7)	44 (16.3)		

Note:

[a] Mann-Whitney U.

[b] Chi-Square tests. Nurse level: N0 level refers to nurses with less than 1 year of clinical work, who can complete the clinical care of mild patients under the guidance of superior nurses; N1 level refers to at least 1 year of clinical work, with 2−3 years of experience, can independently complete the clinical nursing work of mild patients; N2 level refers to nurses who have worked in N1 position for more than 2 years, usually with 4−5 years of experience, have the ability to take care of serious patients, and can participate in the rescue of critically ill patients; N3 level refers to nurses with 6−8 years of experience, who can undertake the nursing of critically ill patients, organize and implement the rescue of critically ill patients, nursing rounds, and participate in the discussion of difficult cases; N4 level refers to those who have 9−10 years or more experience, have the ability to care for critically ill patients and the whole hospital's specialist consultation, and can independently and accurately evaluate, judge and deal with difficult and complex nursing problems of their own profession.

3.3. The influence of socio-demographic variables on the behavioral intention of nurses

The univariate analysis showed that there were statistically significant age differences, type of household registration, whether they were an only child, and whether they had participated in volunteer activities for older adults with disabilities ($P < 0.05$), Table 1. The logistic regression analysis of the variables that were statistically significant in the univariate analysis showed that nurses who held a management position in a department were more motivated to participate in volunteer activities than those who did not ($OR = 1.498$, 95% CI: 1.065−2.107, $P = 0.020$). Furthermore, those who received unpaid help from others had higher participation rates than those who did not receive help

($OR = 1.745$, 95% CI: 1.240−2.456, $P = 0.001$). Nurses rewarded by hospitals or organizations for volunteer activities were more motivated to participate than those who did not ($OR = 1.762$, 95%CI: 1.039−2.988, $P = 0.035$). Nurses with urban household registrations were more motivated to participate than those with rural household registrations ($OR = 0.694$, 95% CI: 0.501−0.960, $P = 0.027$) (Table 2).

3.4. Structural equation modeling of nurse participation in voluntary care services for older adults with disabilities

The Path coefficient (R^2) for the behavioral intention in this study was 0.497, indicating that the model had moderate explanatory power. Structural equation model analysis revealed that

Table 2

Logistic regression of factors of the behavioral intention among nurses.

Variables	β	SE	P	OR	95%CI	
					Lower	Upper
Rural household registration	−0.366	0.166	0.027	0.694	0.501	0.960
Holding a management position	0.404	0.174	0.020	1.498	1.065	2.107
Have received training in elderly care	0.378	0.168	0.025	1.460	1.050	2.029
Have received unpaid help from other volunteers	0.557	0.174	0.001	1.745	1.240	2.456
Have received recognition/rewards for volunteer activities	0.567	0.269	0.035	1.762	1.039	2.988

behavioral attitude ($\beta = 0.456$, $P < 0.001$), subjective norms ($\beta = 0.167$, $P < 0.001$), and perceived behavioral control ($\beta = 0.123$, $P < 0.01$) had a significant positive effect on behavioral intention. Therefore, the three hypotheses proposed in this study were valid (Table 3 and Fig. 2).

4. Discussion

4.1. There are still barriers between nursing and volunteering

In this study, nurses' intention to participate in voluntary care services for older adults with disabilities was above moderate; however, there was still a large gap compared to other types of volunteers. Studies have shown that 79.6% of young-old (seniors between the ages of 60 and 69) were willing to participate in the "time bank" [14], and 74.6% of college students were willing to participate in volunteer services for older adults [15], indicating a relatively high level of intention. In contrast, nurses' intentions to participate were relatively low. The reasons for this may be as follows. a) China has a large population, and healthcare requires considerable time and energy. Some nurses also need to provide care for their children and parents. Considering these factors, it is difficult for nurses to spend time and energy serving others. b) Unsafe practice environments and lack of legal protection are causes of concern for nurses [16]. Despite China's support for the development of the Internet-based model, the effects of the initial development and research on the many platforms currently available in the market have revealed a lack of policies to protect the safety of nurses [17].

4.2. Nurses with different characteristics had different participation intentions

The participation rate of nurses holding a management position was higher than that of nurses not holding a position. This may be because the former had a higher sense of professional benefit than the latter. The sense of professional benefit is a pleasant emotional experience for nurses, as they feel the benefits of their profession at work [18]. Their professional identity and satisfaction can motivate them to actively participate in voluntary care services for older adults with disabilities actively.

Nurses who were praised or rewarded by hospitals or organizations for volunteering had a stronger intention to participate than those who were not, which is consistent with the findings of Yu's

study [19]. A possible reason for this may be that volunteers want to be recognized and feel valued. In addition, a study have shown a positive correlation between motivation and volunteering [20]. Therefore, positive incentives can motivate nurses to participate in voluntary care services.

Nurses with urban household registration had a stronger intention to participate than those with rural household registration. A possible reason is an unbalanced development between urban and rural areas. Volunteerism is more developed and mature in urban areas, less widespread and promoted in rural areas, and more training and education opportunities, as well as volunteer activities, are available in urban areas; therefore, the cultivation of volunteerism is more sustained and deeply rooted, and nurses in urban areas are more willing to provide voluntary care services for older adults with disabilities.

4.3. Behavioral attitude, subjective norm, and perceived behavioral control have positive effects on the behavioral intention of nurses

In this study, behavioral attitude, subjective norms, and perceived behavioral control explained behavioral intention at a moderate level of 49.7%, indicating that it is feasible to apply the theory of planned behavior to explain the intention of nurses to volunteer in care services for older adults with disabilities.

A study by Kim et al. on caregivers' willingness to participate in caring for patients with severe acute respiratory syndrome [21] showed that attitudes influenced caregivers' participation, noting that positive attitudes had a positive facilitating effect. Therefore, it is important to pay attention to the positive guidance of nurses' attitudes, promote volunteerism, and publicize volunteer activities so that nurses can establish the right values and sense of social responsibility.

Subjective norms impacted nurses' intention to participate in voluntary care services for older adults with disabilities. A study by Parash [22] that included a survey of college students showed that subjective norms had a positive impact on student's intention to participate in blood donation, and it is important to focus on the power of family, friends, leaders, fellow volunteers, and volunteer activity organizers. The higher the level of social support, the higher the willingness to participate. Therefore, nurses should constantly improve their level of social support when participating in voluntary care services for older adults with disabilities to increase their intention to participate, which, in turn, triggers voluntary behavior.

Table 3

Behavioral attitude, subjective norm and perceived behavioral control have positive effects on behavioral intention.

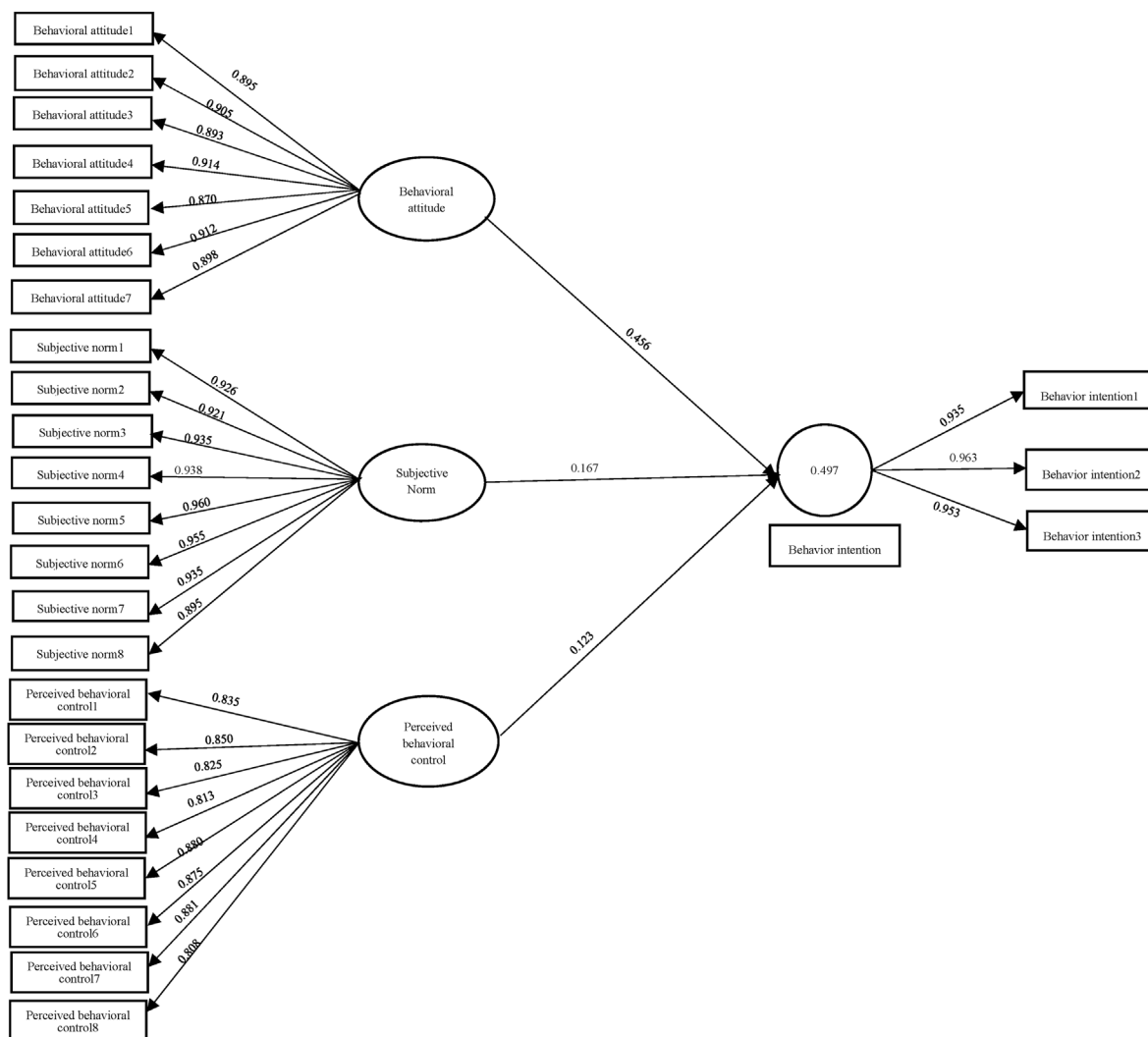| Path	Standardized coefficients	Standard deviation	t	P
Subjective norm → Behavioral intention	0.167	0.040	4.178	<0.001
Attitude toward the behavior → Behavioral intention	0.456	0.043	10.577	<0.001
Perceived behavioral control → Behavioral intention	0.123	0.036	3.417	0.001

Fig. 2. Significant path diagram of the model.

Perceptual behavioral control also influenced the intention to participate, consistent with Che's [23] findings regarding nursing students' willingness to work with older adults. Many factors might influence nurses from volunteering to care for older adults with disabilities, including time, the ability to volunteer, opportunities to volunteer, channels of participation, and risks of volunteer activities. These factors are both external and internal, as they include the ability of nurses to overcome obstacles and their psychological adaptability. Therefore, it is necessary to identify the factors that prevent nurses from volunteering early, improve the external environment to meet nurses' needs, continuously improve their problem-solving ability, and enhance their sense of self-efficacy. The higher the self-efficacy of nurses, the more willing and motivated they are to participate in volunteer activities [24]. Thus, nurses' intention to participate can be stimulated.

5. Limitations

This study only investigated the intention of nurses to participate in voluntary care services for older adults with disabilities in Suzhou, a relatively developed city in East China. In the future, we will consider extending the survey sample to other regions. Due to time constraints, no further investigation was conducted on volunteering behavior, and further research is needed to explain the relationship between volunteering intention and behavior. Further in-depth research on this topic will be conducted in the future.

6. Conclusion

The type of household registration, holding a management position, receiving unpaid help from other volunteers, receiving elderly care training, and receiving recognition/rewards for volunteer activities were found to influence nurses' intention to volunteer to care for older adults with disabilities. In addition, nurses' behavioral intention was positively correlated with behavioral attitudes, subjective norms, and perceived behavioral control. Nurses' intention to participate in voluntary care services for older adults with disabilities can be increased by understanding their potential needs and barriers to volunteering, establishing a supportive environment, and improving their self-efficacy through training and on-site experiences.

Data availability statement

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

CRediT authorship contribution statement

Hengmei Cui: Conceptualization, Methodology, Formal analysis, Investigation, Writing-original draft. **Rui Sun:** Conceptualization, Methodology, Writing-original draft. **Yaling Wang:** Investigation, Data curation, Formal analysis. **Lu Lin:** Writing - review & editing, Supervision. **Ran Duo:** Investigation, Data Curation. **Yuchen Li:** Investigation, Validation. **Fei Ma:** Investigation, Validation. **Huiling Li:** Resources, Supervision, Funding acquisition.

Declaration of competing interest

No conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnss.2022.12.008.

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