Asian Nursing Research 15 (2021) 23–29

Contents lists available at ScienceDirect

Asian Nursing Research

journal homepage: www.asian-nursingresearch.com

Research Article

Development and Validation of a Management of Workplace Violence Competence Scale for Nursing Practicum Students

Dongyan Lu,[1, 2] Sarah Yeun-Sim Jeong,[3] Lingyan Zhu[4, *]

[1] School of Nursing, Huzhou University, Zhejiang, China
[2] Huzhou Central Hospital, Zhejiang, China
[3] School of Nursing & Midwifery, University of Newcastle, NSW, Australia
[4] Department of Nursing, Shanghai Jiao Tong University Affiliated Sixth People's Hospital, Shanghai, China

ARTICLE INFO

Article history:
Received 27 May 2020
Received in revised form
17 September 2020
Accepted 11 October 2020

Keywords:
nursing
psychometrics
students
workplace violence

SUMMARY

Purpose: The aim of this study was to develop a scale to measure nursing students' competence in managing violence from patients and relatives in the hospital where nursing students perform clinical practicum.
Methods: Literature review and Delphi expert consultation were utilized to develop the content of the management of workplace violence competence scale (MWVCS). A convenience sample of 797 nursing students responded to the questionnaire. Exploratory factor analysis of the scale was performed. Internal consistency and test–retest reliability were examined.
Results: The MWVCS consisted of 40 items with a five-point scale. Seven factors explained 63.2% of the total explained variance. The content validity index for the scale was .99. Cronbach's α of the scale was .96, and test–retest correlations were found to be ≥ .76.
Conclusion: The MWVCS is a reliable and valid scale for nursing educators to assess the level of students' competence in violence management and to evaluate the effectiveness of education to enhance their ability to manage workplace violence.
© 2021 Korean Society of Nursing Science. Published by Elsevier BV. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Introduction

Workplace violence (WPV) in the health sector is a significant global public health problem. In particular, recent studies have shown that more than half of nursing students experienced WPV during their clinical placement [1–3]. The extent of WPV toward nursing students includes both physical and psychological violence, such as kicking, pushing, pinching, verbal abuse, and threats, which have negatively impacted on students' attitudes toward nursing profession [4]. In the UK, the most perpetrators in the incidents experienced by nursing students were nurses (19.6%), and a small proportion of perpetrators was patients (4.9%) [4]. On the contrary, a survey in China showed that most perpetrators of WPV toward nursing students were patients or relatives (77.1%) [5]. In another study conducted in Korea, patients or patients' family members were the most frequent offenders of violence (84.8%) followed by nurses (78.6%) or physicians (57.9%) [6]. Although the incidence and perpetrator of workplace violence across China, the UK, and Korea are different because of social and cultural divergence, among all the healthcare professionals, nursing students are the most vulnerable and at-risk group for WPV because of their inexperience in clinical practice, frequent ward rotation, and the challenges of building relationship quickly with patients and nurses [7]. In addition to physical harm, WPV could cause negative impacts on nursing students psychologically. A survey in China showed that 59.1% of nursing students (n = 543) worried about WPV [8], and the majority of students who experienced WPV had the feeling of anxiety and depression [2], which could decrease students' job satisfaction and intensify the deterioration of relationship with nurses in workplace, ultimately affecting the standards of patient care [4]. It was shown that one in five nursing students (n = 657) considered career change, which will affect the nursing team building and workforce in the future [4].

Dongyan Lu: https://orcid.org/0000-0001-5561-5676; Sarah Yeun-Sim Jeong: https://orcid.org/0000-0001-7253-1511; Lingyan Zhu: https://orcid.org/0000-0002-9380-9145

* Correspondence to: Lingyan Zhu, Department of Nursing, Shanghai Jiao Tong University Affiliated Sixth People's Hospital, 600 Yishan Road, Xuhui District, Shanghai, 200233, China.

E-mail addresses: donna651@163.com, Sarah.Jeong@newcastle.edu.au, juliets@aliyun.com

https://doi.org/10.1016/j.anr.2020.10.005
p1976-1317 e2093-7482/© 2021 Korean Society of Nursing Science. Published by Elsevier BV. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Because violence prevention is evident to be crucial for nursing students, relevant guidelines and trainings for WPV have been gradually developed [9]. Framework guidelines for addressing workplace violence in the health sector is a well-established joint program of International Labour Office (ILO), International Council of Nurse (ICN), World Health Organization (WHO), and Public Service International (PSI), which clearly illustrates each step of violence management [10]. Apart from the guidelines, some educational programs associated with WPV were designed to be specifically for nursing students. For example, a one-day Management of Aggression Training program, which covered definition, types, legislation, and consequences of WPV as well as the assault cycle and related breakaway skills, was delivered to nursing students in Australia [11]. In addition, there were also some training courses in Germany, Ireland, and America [12–14]. Although the nursing students who participated in these programs have reported a high level of satisfaction with the programs, the level of confidence and improvement of attitude, knowledge, and skills are not comprehensive, and the measurement tools used are not valid. A comprehensive assessment for nursing students' competence in WPV management is required.

Recently, there are some instruments developed to evaluate the skills of violence management. For example, the De-escalating Aggressive Behaviour Scale is a German instrument that assesses nursing students' de-escalation skill of performance in training programs [12]. Although this seven-item, one-dimensional scale has proved to be a practical measure of de-escalation skill with good reliability and validity and has already been modified in English [15], other skills such as breakaway and restraints skills in violence management could not be measured with this tool. There are also other instruments that evaluate healthcare workers' attitudes or confidence associated with WPV. The Management of Aggression and Violence Attitude Scale, which has been mostly used in mental health settings, principally measures nurses' perception of the causes of violence and the approaches to violence management [16]. Although the Management of Aggression and Violence Attitude Scale has been found reliable and valid, it focuses on registered nurses and other registered healthcare professionals. Another one-dimension instrument, the Confidence in Coping with Patient Aggression Instrument, was designed to measure self-confidence of staff in Germany [17]. Although confidence is crucial for performance, it is also underpinned by competence [18]. These existing instruments were developed to measure one single aspect associated with violence management. There is still a lack of instruments directly and specially reflecting nursing students' competence related to WPV management.

The 4R crisis management theory proposed by Heath (1998) has been widely applied into studies in the health field, including violence management [19–21]. In this theory, the four stages of crisis management include reduction, readiness, response, and recovery. The goal of crisis management is to reduce the impact and harmfulness of sudden and uncertain events, which is consistent with WPV management.

The current study aimed to develop and test the MWVCS for nursing students, which is underpinned by the 4R crisis management theory and focused on WPV of the patients or his/her relatives toward students in healthcare facilities. According to the framework guidelines by ILO, ICN, WHO, and PSI, the operational definition of “workplace violence against nursing students” in this study was adapted: incidents where nursing students are abused, threatened, or assaulted by patients and relatives during clinical practicum, involving an explicit or implicit challenge to their safety, well-being, or health.

Methods

The study employed a Delphi method to develop MWVCS among nursing students and psychometric testing of the scale. It consisted of three phases: phase 1, items development; phase 2, Delphi expert consultation; and phase 3, psychometric testing [22].

Phase 1: Items Development

Because 4R crisis management theory was considered as the conceptual foundation [23], the management of WPV was divided into four components: reduction of violence, readiness for violence, response to violence, and recovery from violence. Items were generated from three sources: 1) referring to guidelines, 2) review of literature, and 3) review of items from existing instruments. The framework guidelines of ILO, ICN, WHO, and PSI [10], illustrating the key elements in violence management including violence recognition, workplace risk assessment, intervention to deal with violence, and after-the-event intervention, provided important references for the study. Four domains and 56 items were created to form the initial scale. It consisted of domain 1 (reduction of violence, 18 items), domain 2 (readiness for violence, 16 items), domain 3 (response to violence, 11 items), and domain 4 (recovery from violence, 11 items). A five-point scale was designed for students to rate their level of agreement with each of the items. Each item of MWVCS was rated from 1 (strongly disagree) to 5 (strongly agree). The higher score indicates the better competence in management of WPV.

Phase 2: Delphi Expert Consultation

The Delphi technique was used to establish content validity of the MWVCS in two rounds [24]. The experts were selected based on their professional experience. In total, 18 experts with at least 10 years of professional experience were invited to the Delphi expert consultation (Table 1). Among them, nine experts were nurses in charge of nursing management in hospitals, one expert was a doctor in charge of hospital management, and eight experts were teachers in nursing schools. A four-point scale (1 = irrelevant; 2 = irrelevant unless with major revision; 3 = relevant but minor revision required; 4 = relevant) was used to assess content validity by content validity index (CVI). All items were set up with an open expert comment column to collect expert suggestions. The consultation scales were sent to the experts for completion in 3 weeks. After the collection of the consultation scales in the first round, the research team analyzed the data and discussed revisions. Item-level CVI (I-CVI) was defined as the proportion of experts who gave a score of either 3 or 4. The criterion for inclusion of the item was that the I-CVI was no less than .80 [24]. In the first round, the I-CVI ranged from .83 to 1.00 and the scale-level CVI (S-CVI) was .98. After the first round, eight of the initial 56 items were removed because of overlap with other items (e.g., “I am aware of high-risk areas of hospital violence”), inapplicability in nursing students (e.g., “I will respect others and encourage the team to reach their full potential”), or inappropriate in competence measuring (e.g., “I believe I will benefit from hospital violence related training”). Five additional items were added (e.g., “I will seek support from classmates, teachers and family after the violence”) based on the experts' suggestions. Thirteen items were revised based on the advice such as avoid asking more than two questions in one item, reduce the use of vocabulary indicating the level (e.g., “very”), add explanations of some words (e.g., “disengagement techniques”), add “with the help of teachers” in some items, etc. The revised scale and a detailed list of revisions were sent to the experts in the second round.

In the second round, the I-CVI ranged from .83 to 1.00 and the S-CVI was .99. After the second round, one item was removed because of inconformity with most current hospital conditions: "I understand the staff safe house in the hospital". Three items were revised to make the meaning more appropriate (e.g., "I will verify the vague information with patients or relatives" instead of "I will use clarification techniques to verify the patient's vague information"). A 52-item scale was generated after two rounds of expert consultation.

Phase 3: Psychometric Testing

After the Delphi expert consultation, a pilot test was conducted on 20 final-year nursing students in clinical placement using a convenient sampling method. The pilot test was performed to assess the understandability of the items. The pilot test showed that the participants (n = 20) reported no difficulty in reading and understanding all items. Most participants were women (n = 17), with ages ranging between 19 to 22 years. All of them have attended clinical placement for over 6 months. Through interview, it was found that the items were understood by participants as the research team intended. Further analysis of the MWVCS was conducted then. The methods of analysis included item analysis for item appropriation, exploratory factor analysis (EFA), convergent validity, and discriminant validity for construct validity, Cronbach's α coefficients for internal consistency reliability, and test–retest correlations for indicating stability reliability [25].

Participants

A convenience sampling method was used to recruit nursing students from nine universities/colleges in China. Most nursing students in China take clinical practicum in their final year, at which time they have close contact with patients. The final-year nursing students in clinical placement were eligible for the participation. The sample size should be 5–10 times of the number of items in factor analysis [26]. The sample size was calculated to be 260–520. Considering a dropout rate, the questionnaire was distributed to a total of 1,007 nursing students. For test–retest analysis, a group of 20 to 30 participants is recommended [25]. A convenience sampling of 25 final-year nursing students in local hospital was selected to evaluate test–retest reliability by filling in the MWVCS twice in a two-week interval.

Table 1 *Demographic Characteristics of Experts in the Delphi Expert Consultation (N = 18).*

Characteristics	N	%
Age (years)		
30–39	4	22.2
40–49	8	44.5
50–59	6	33.3
Education level		
Bachelor	3	16.7
Master	9	50.0
PhD	6	33.3
Professional title		
Intermediate	2	11.1
Senior vice	6	33.3
Senior	10	55.6
Working experience (years)		
10–19	7	38.9
20–29	10	55.6
30–39	1	5.5

Note. PhD = Doctor of Philosophy.

Data Collection

Nursing students were approached by the researchers and investigators when they attended courses or meetings in the school. The aim and procedures of the study were explained to the students the survey. Participants were asked to complete and return the questionnaire at the end of the session.

Data Analysis

Data analysis was conducted with the SPSS 24.0 software package (IBM Corp., Armonk, NY, USA). Descriptive analysis was utilized to summarize sample characteristics. An alpha level of .05 was used for all statistical tests. Item analysis was performed by three approaches, including the critical ratio obtained from *t*-test results, item-total correlation coefficient, and Cronbach's α coefficient after item deletion. Items meeting one of the following elimination criteria were removed: (1) the *t*-value of the 27 percentile high-score and low-score groups was insignificant or less than 3.00; (2) the item-total correlation coefficient was insignificant or less than .40; (3) Cronbach's α coefficient after each item deletion was more than that of the entire scale [26]. EFA was performed with principal component analysis and promax rotation. Factors with eigen values greater than 1.00 were extracted. The items with factor loading less than .40 were considered to be eliminated from the scale, and each factor was expected to contain at least three items [22].

Ethical Consideration

The present study was approved by the Ethics Committee of Huzhou University (Approval no. 20190910). The survey was anonymous, and the data collected will be kept confidential. They were assured of the confidentiality and anonymity, as well as that data collected were strictly for study purpose only. The participants were made aware of their right to decline or withdraw their participation at any time without any disadvantage. All respondents participated voluntarily.

Results

Sample Characteristics

In total, 1,007 nursing students were invited to participate in the study, and 797 students completed the survey with 79.1% response rate (Table 2). The majority of students were female (89.6%), with an average age of 21.77 years (standard deviation = 1.10). The majority of the students (99.0%) have attended clinical placement for over 6 months when participating in the study.

Item Analysis

Two extreme groups analysis showed that all 52 items had values of critical ratio at a significant level, ranging from 6.80 to 20.51, indicating that the items had a good discrimination between high and low groups. Apart from the item Q8, item-total correlation coefficients were observed between .41 and .68. After each item deletion, the calculated Cronbach's α coefficient was lower than .96, except for the item Q10. Therefore, these two items were deleted by item analysis.

Validity of the MWVCC

According to the Kaiser-Meyer-Olkin (KMO) and Bartlett's test, the KMO value was .96 and χ^2 was 23557.13, respectively ($p < .001$),

which indicated the suitability for factor analysis. The item Q9 and Q14 were firstly removed because its factor loading was lower than .40. Then, because some items cannot be explained by corresponding factors, eight items including Q24, Q28, Q29, Q30, Q13, Q6, Q7, and Q11 were progressively deleted.

Finally, seven factors were extracted from the 40 items, with all item loadings above .40 (Table 3). The names of the factors were determined in accordance with the content of the items contained and by referring to the framework guidelines for addressing workplace violence in the health sector mentioned in Introduction and Methods. The factor 1–7 was named as after-the-event recovery, nurse–patient interaction, response to violence, violence cognition, utilization of protective facilities, knowledge renewal, and risk assessment, respectively. These factors contributed 63.2% of the total variance, indicating good construct validity [22].

The convergent validity of the MWVCS was assessed by examining correlations between the factors and the MWVCS. The convergent correlations ranged from .68 to .88 ($p < .001$) (Table 4). The discriminant validity was assessed by testing the correlations among the seven factors. The correlations ranged from .39 to .60, which were lower than convergent validity, except one correlation between response to violence and after-the-event recovery being .75. The correlations among the MWVCS factors provide evidence for both convergent and discriminant validity (Table 4).

The I-CVI of the final 40 items ranged from .83 to 1.00, and the S-CVI was .99, which indicated good content validity [24].

Reliability of the MWVCC

The Cronbach's α coefficient of the total scale was .96 and that of the seven factors ranged from .80 to .92. The test–retest correlation coefficient of .90 showed that the MWVCC had excellent category of scale stability [27]. Test–retest reliabilities of the MWVCC by subdomains were .76 for violence cognition, .79 for utilization of protective facilities, .81 for risk assessment, .76 for knowledge renewal, .77 for response to violence, .83 for after-the-event recovery, and .85 for nurse–patient interaction.

Discussion

It is evident that an exposure to WPV has a long-term negative impact on physical and psychological health of nursing students [28]. Nursing students are a group of inexperienced health workers who are in the transition from students to professionals and challenged by academic and clinical stress [29]. They have been shown to lack social experience, interpersonal skills, coping strategies, and psychological adjustment ability [30,31]. Given the focus of the existing WPV programs on nurses in specific settings and the limited scope of outcome measures in evaluation of programs, nursing students who are in a vulnerable position require special attention. The study attempted to develop an instrument to assist assessing and evaluating competence in WPV management among nursing students, which is one of the main aspects in WPV prevention education.

Table 2 *Demographic Characteristics of Participants in the Study (N = 797).*

Characteristics	N	%
Gender		
Men	83	10.4
Women	714	89.6
Age (years)		
18–20	66	8.3
21–23	673	84.4
≥24	58	7.3
Education program		
Junior college study (3 years)	593	74.4
Bachelor's degree study (4 years)	204	25.6
Clinical placement		
< 4 months	5	0.6
4–6 months	3	0.4
> 6 months	789	99.0

The MWVCS comprised 40 items with seven factors, which is consistent with conceptual attributes of 4R crisis management theory. In 4R crisis management theory, the first stage, reduction, refers to the reduction of risk, thus reducing the possibility and harm of the crisis. Two factors, violence cognition and nurse–patient interaction, corresponded to “reduction” in the theory. Violence cognition refers to nursing students' understanding of basic theoretical knowledge of workplace violence, including items on causes, current situation, psychological knowledge, and effects of workplace violence. Nurse–patient interaction consists of items on the communication and interaction between nursing students and patients in the process of providing nursing services.

The second stage of the theory, readiness, refers to the preparation made before the occurrence of a crisis, the purpose of which is to enhance the ability to deal with a crisis. Three factors, utilization of protective facilities, risk assessment, and knowledge renewal, corresponded to “readiness”. Utilization of protective facilities includes items on nursing students' understanding and use of violence prevention equipment and safety measures provided by the hospital. Risk assessment consists of items on nursing students' assessment of the risk and the identification of early signs before workplace violence occurs. Knowledge renewal consists of items about actively participating in education and training related to workplace violence and learning related knowledge to enhance their ability to manage violence.

The third stage, response, refers to the response to a crisis situation, that is, what methods or strategies should be adopted to deal with a crisis. One factor, response to violence, was consistent with it. Response to violence consists of items related to reasonably using de-escalation skill to ease the progress of violence and protecting themselves and getting out of dangerous situations as soon as possible.

The fourth stage, recovery, refers to the arrangements for recovery work and the summary and analysis of related experience after the crisis is under control. One factor, after-the-event recovery, including items on performing post-incident treatment, psychological adjustment, and experience reflection after workplace violence, was consistent with the fourth stage.

The MWVCS developed has its strengths in that it was underpinned by 4R crisis management theory [23] and that the framework guidelines had great reference value to the items development [10]. Another strength of the study is that, through the Delphi method, it was possible to identify and reflect international and national, and collective and individual requirements in managing WPV among nursing students into a set of competence for use in China and potentially many other countries across the world. In the phase of Delphi Expert Consultation, several items were revised and added. For example, verification of vague information was suggested by experts, which was considered as an important interaction skill for violence prevention. In particular, experts noted that seeking assistance from the social support system was a considerable way of psychological adjustment after confronting with WPV. Therefore, the final MWVCS includes Q17 and Q47 to address this suggestion.

Relevant instruments have been globally developed, among which the existing instruments aimed at the attitudes [16], self-confidence [17], or a skill [12]. In the current study, the MWVCS placed emphasis on the management competence throughout the violence occurrence and development, covering reduction,

Table 3 *The MWVCS Exploratory Factor Analysis.*

Items	M±SD	Factors						
		1	2	3	4	5	6	7
After-the-event recovery	42.61 ± 6.65							
Q51. I can reflect on the inadequacies in the process of addressing the violence after the incident.	3.89 ± 0.74	**.83**	.13	.13	.01	.05	.13	.12
Q43. I can report violence correctly and effectively with the help of teachers after the incident.	3.91 ± 0.83	**.78**	.10	.07	.01	.14	.06	.27
Q50. I can make an analysis of the causes of the incident after the violence.	3.81 ± 0.81	**.78**	−.15	.10	.05	.03	.16	.19
Q44. I can choose an effective legal approach for personal rights protection with the help of teachers after the violence.	3.89 ± 0.78	**.78**	.01	.02	.03	.03	.17	.10
Q45. I can objectively assess my psychological state after experiencing the violence.	3.78 ± 0.83	**.77**	.19	.07	.07	.13	.13	.24
Q52. I will share my experience of hospital violence with other students to avoid the recurrence of such incidents.	3.99 ± 0.79	**.72**	−.03	.05	.01	.11	.22	.09
Q49. I can give psychological comfort to my colleagues after they suffered hospital violence.	3.96 ± 0.76	**.68**	−.03	.07	.06	.10	.26	.04
Q48. I know how to ask for professional psychological help after the violence.	3.70 ± 0.86	**.65**	−.11	.07	.05	.02	.00	.30
Q42. I can choose appropriate ways (such as photos, monitoring, witnesses, etc.) to collect evidence with the help of teachers after the violence.	3.84 ± 0.83	**.63**	.14	.24	.09	.14	.07	.22
Q46. I can use appropriate psychological adjustment methods to adjust the psychological state (such as moderate relaxation, reasonable catharsis, self-suggestion, etc.) after the violence.	3.82 ± 0.82	**.61**	.06	.14	.04	.09	.06	.07
Q47. I will seek support from classmates, teachers and family after the violence.	4.01 ± 0.79	**.54**	.15	.03	.01	.12	.23	.03
Nurse–patient interaction	23.79 ± 3.64							
Q19. I don't use derogatory or threatening language with patients.	4.04 ± 0.85	.09	**.79**	.02	.00	.10	.05	.01
Q18. I respond to patients in appropriate ways (nodding, smiling, encouraging, affirming, etc.).	4.07 ± 0.76	.05	**.77**	.01	.01	.04	.06	.05
Q16. I give attention to the verbal and non-verbal behaviors (such as words, tone, expressions, actions, etc.) of the patients or relatives.	3.89 ± 0.76	.03	**.73**	.00	.09	.08	.06	.19
Q17. I will verify the vague information with patients or relatives.	3.88 ± 0.81	.02	**.68**	.03	.02	.03	.11	.29
Q12. I respect the rights of patients and avoid unintentional infringement or injury.	4.09 ± 0.82	.03	**.63**	.05	.11	.03	.18	.14
Q15. I will adjust the way of communication according to the cognition of patients or relatives.	3.82 ± 0.76	.02	**.63**	.02	.09	.02	-.07	.20
Response to violence	29.90 ± 4.80							
Q35. When the patients or relatives raise the voice or become emotional, I can use appropriate communication skills to ease the tension.	3.79 ± 0.76	.05	.07	**.82**	.04	.07	.02	.10
Q38. When communicating with patients or relatives who have signs of violence, I will try to move to an monitoring area.	3.84 ± 0.82	.07	.13	**.70**	.10	.07	.21	.04
Q34. I can manage my emotions well when facing complaints and misunderstandings from patients or relatives.	3.78 ± 0.77	.03	.16	**.70**	.11	.05	.06	.09
Q37. When facing emotional patients or relatives, I will keep an appropriate distance.	3.98 ± 0.76	.06	.06	**.69**	.04	.18	.30	.02
Q36. I know the ways to control the violence tendencies of special patients (e.g., psychopath, alcoholics, drug user).	3.48 ± 0.90	.05	.18	**.66**	.06	.03	.15	.25
Q39. When encountering hospital violence, I can appropriately turn to teachers for help.	3.98 ± 0.77	.13	.07	**.62**	.01	.14	.24	.16
Q41. If controlled by patients or relatives, I can use disengagement techniques (e.g., protect vital parts, communicate to distract attention, utilize disengagement techniques, and call for help timely).	3.60 ± 0.88	.22	.02	**.54**	.04	.05	.25	.17
Q40. When encountering hospital violence, I can activate the one-button alarm device.	3.45 ± 0.95	.18	.23	**.45**	.11	.35	.11	.02
Violence cognition	17.65 ± 3.46							
Q2. I know the causes of the violence in the health sector.	3.60 ± 0.81	.01	.05	.01	**.83**	.02	.06	.08
Q4. I know the current situation of hospital violence in our country.	3.45 ± 0.89	.03	.04	.05	**.78**	.02	.05	.09
Q1. I know the workplace violence includes physical and psychological violence.	3.57 ± 0.89	.02	.07	.01	**.78**	.02	.10	.09
Q3. I know the psychological knowledge of violence in the health sector.	3.29 ± 0.88	.02	.04	.01	**.77**	.05	.16	.16
Q5. I know the impact of hospital violence.	3.75 ± 0.84	.03	.14	.08	**.77**	.01	.00	.19
Utilization of protective facilities	13.86 ± 3.12							
Q21. I know the location of the one-button alarm device in the hospital.	3.35 ± 0.99	.06	.04	.05	.02	**.92**	.09	.03
Q20. I am familiar with the position of the surveillance camera in my work area.	3.47 ± 0.96	.02	.15	.14	.06	**.79**	.09	.03
Q23. I know the violence contingency plan of the hospital.	3.28 ± 1.00	.02	.12	.05	.13	**.65**	.02	.14
Q22. I know the staff passage in the hospital.	3.75 ± 0.95	.06	.18	.01	.08	**.61**	.31	.05
Knowledge renewal	11.94 ± 2.17							
Q32. I will participate actively in training related to violence organized by the hospital.	4.00 ± 0.84	.06	.01	.04	.00	.14	**.75**	.03
Q33. I will improve my violence management competency by self-directed learning via various approaches.	3.88 ± 0.84	.02	.15	.07	.07	.15	**.72**	.18
Q31. I think the occupational protection education in the health sector should contain violence content.	4.06 ± 0.83	.10	.12	.04	.10	.04	**.67**	.11
Risk assessment	10.89 ± 2.11							
Q26. I can identify the patients or relatives with high risk of violence based on their characteristics (such as personality, expectation of medical treatment, social background, economic conditions, etc.)	3.60 ± 0.83	.03	.13	.12	.11	.06	.07	**.73**
Q25. I can assess the signs of violence using STAMP (Staring and eye contact, Tone and volume of voice, Anxiety, Mumbling and Pacing).	3.64 ± 0.84	.08	.08	.07	.04	.05	.19	**.66**
Q27. I can identify high-risk situations where violence occurs (e.g., working alone, unmet demands of the patients or relatives, misunderstanding, unsatisfying treatment effect, etc.)	3.64 ± 0.82	.13	.16	.03	.04	.01	.07	**.65**
Total score	150.64 ± 20.40							
Eigen value		15.14	2.61	2.30	1.67	1.24	1.18	1.15
Explained variance (%)		37.8	6.5	5.8	4.2	3.1	3.0	2.9
Cumulative variance (%)		37.8	44.4	50.1	54.3	57.4	60.3	63.2

The bold indicates salient load on a factor.
Note. M = mean; SD = standard deviation.

readiness, response, and recovery. It should take 15–20 minutes for students to complete the MWVCS. This instrument could be helpful for nursing educators to obtain a comprehensive understanding of students' violence management competence.

This study has some limitations. First, because no suitable measurement tool was found as a criterion, criterion validity was not performed. Second, two items associated with attitudes were eliminated during item analysis, and the remaining attitude related

Table 4 *Correlations among the MWVCS factors.*

Variable	Violence cognition	Nurse–patient interaction	Utilization of protective facilities	Risk assessment	Knowledge renewal	Response to violence	After-the-event recovery	MWVCS
Violence cognition	1							
Nurse–patient interaction	.50**	1						
Utilization of protective facilities	.46**	.40**	1					
Risk assessment	.48**	.49**	.53**	1				
Knowledge renewal	.39**	.60**	.44**	.50**	1			
Response to violence	.52**	.53**	.53**	.58**	.54**	1		
After-the-event recovery	.49**	.59**	.46**	.57**	.60**	.75**	1	
MWVCS	.70**	.75**	.68**	.73**	.72**	.86**	.88**	1

**$p < .001$.
Note. MWVCS, management of workplace violence competence scale.

items were subsequently removed because of the factor containing less than three items. Attitudes toward violence have an effect on the management of WPV [32]. Thus, it is recommended that the MWVCS collocate with a violence-related attitude scale to obtain an overall understanding of students' competence in violence management and their attitudes.

The instrument has important implications for nursing education in the future. Nursing educators in clinical settings have the great responsibility to cultivate students' coping capacity. The competence level of nursing students in the reduction of violence, readiness for violence, response to violence, and recovery from violence should be observed and assessed by educators. Although a number of training programs have been developed, few of them were specially tailored to student requirements [9]. The instrument can be used for nursing students with the experience of clinical observation or practicum. In addition, it can be used as a pretest or post-test tool in related training. Education courses or training programs could be developed based on the understanding of nursing students' strengths and weaknesses in violence management. The effectiveness of the education intervention could also be evaluated using the instrument. All nurses are expected to have the intention to provide violence prevention education [33]. The instruments could provide guidance for nurses in clinical settings, such as providing alarm device introduction, violence risk patient informing, and psychological care. Therefore, nursing students' awareness of violence prevention could be enhanced, and violence incidents and harmfulness could be reduced. Currently, there is a gap between the student requirements and training in the literature. This instrument would allow nursing academics to analyze the influential factors of students' competence in violence management and design scientific targeted training programs.

Conclusion

The MWVCS in the current study has been demonstrated to have good reliability and validity in a large sample of nursing students. It consists of 40 items in seven factors and could be used to measure competence in WPV management. It is a valuable instrument for nursing educators to understand students' competence, identify their educational needs, develop, and evaluate the effectiveness of educational programs. Further studies are needed to test the scale in different contexts and cultures.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

The authors would like to thank all the participants in the study.

References

1. Hopkins M, Fetherston CM, Morrison P. Prevalence and characteristics of aggression and violence experienced by Western Australian nursing students during clinical practice. Contemp Nurse. 2014;49(1):113–21. https://doi.org/10.1080/10376178.2014.11081961
2. Budden LM, Birks M, Cant R, Bagley T, Park T. Australian nursing students' experience of bullying and/or harassment during clinical placement. Collegian. 2015;24(2):125–33. https://doi.org/10.1016/j.colegn.2015.11.004
3. Wang C. Influence of hospital violence on professional identity of practical nursing students. Chin Nurs Res. 2016;30(12):1517–9. https://doi.org/10.3969/j.issn.1009-6493.2016.12.040. Chinese.
4. Tee S, Özçetin YS, Russell-Westhead M. Workplace violence experienced by nursing students: a UK survey. Nurse Educ Today. 2016;41:30–5. https://doi.org/10.1016/j.nedt.2016.03.014
5. Liao YL, Liu TY, Wan GL. Work place violence on the impact of student nurses besides coping strategies. Acta Med Sinica. 2010;23(4):434–6. https://doi.org/10.3969/j.issn.1008-2409.2010.04.031. Chinese.
6. Park JE, Kim DH, Park JH. Violence against nursing students during clinical practice: experiences, perception, responses and coping with violence. J Korea Acad Ind Coop Soc. 2017;18(10):652–62. https://doi.org/10.5762/KAIS.2017.18.10.652. Korean.
7. Magnavita N, Heponiemi T. Workplace violence against nursing students and nurses: an Italian experience. J Nurs Scholarsh. 2011;43(2):203–10. https://doi.org/10.1111/j.1547-5069.2011.01392.x
8. Ye QQ, Li Y, Li JF, Zou JJ, Ni CF, Wang S, et al. Survey of influence of incident of violence between nurses and patients on nursing students in school. Chin Nurs Res. 2016;30(4):1224–7. https://doi.org/10.3969/j.issn.1009-6493.2016.10.021. Chinese.
9. Heckemann B, Zeller A, Hahn S, Dassen T, Schols JM, Halfens RJ. The effect of aggression management training programmes for nursing staff and students working in an acute hospital setting. A narrative review of current literature. Nurse Educ Today. 2015;35(1):212–9. https://doi.org/10.1016/j.nedt.2014.08.003
10. International Labour Office, International Council of Nurses, World Health Organization, Public Service International. Framework guidelines for addressing workplace violence in the health sector [Internet]. Switzerland: Geneva; 2002 [cited 2020 Jan 1]. Available from: https://apps.who.int/iris/handle/10665/42617
11. Jonas-Dwyer DRD, Gallagher O, Saunders R, Dugmore H, Bulsara C, Metcalfe H. Confronting reality: a case study of a group of student nurses undertaking a management of aggression training (MOAT) program. Nurse Educ Pract. 2017;27:78–88. https://doi.org/10.1016/j.nepr.2017.08.008
12. Nau J, Halfens R, Needham I, Halfens R. The de-escalating aggressive Behaviour scale: development and psychometric testing. J Adv Nurs. 2009;65(9):1956–64. https://doi.org/10.1111/j.1365-2648.2009.05087.x
13. Lyng C, Cocoman A, Ward E, McGrath M. Managing Challenging Situations in Practice: a new program developed to meet the specific needs of nursing students. J Nurs Educ. 2012;51(11):656–9. https://doi.org/10.3928/01484834-20121005-01
14. Brann M, Hartley D. Nursing student evaluation of NIOSH workplace violence prevention for nurses online course. J Saf Res. 2017;60:85–91. https://doi.org/10.1016/j.jsr.2016.12.003
15. Mavandadi V, Bieling PJ, Madsen V. Effective ingredients of verbal de-escalation: validating an English modified version of the 'De-Escalating Aggressive Behaviour Scale'. J Psychiatr Ment Health Nurs. 2016;23(6-7):357–68. https://doi.org/10.1111/jpm.12310

16. Duxbury J. Testing a new tool: the management of aggression and violence attitude scale (MAVAS). Nurse Res. 2003;10(4):39–52. https://doi.org/10.7748/nr2003.07.10.4.39.c5906
17. Thackrey M. Clinician confidence in coping with patient aggression: assessment and enhancement. Prof Psychol Res Pract. 1987;18(1):57–60. https://doi.org/10.1037/0735-7028.18.1.57
18. Bandura A. Perceived self-efficacy in cognitive development and functioning. Educ Psychol. 1993;28(2):117–48. https://doi.org/10.1207/s15326985ep2802_3
19. Hu Y. A research on public hospitals' crisis management against violent conflicts: based on 4R Theory [master's thesis]. China: Beijing Institute of Technology; 2015. Chinese.
20. Ritchie AB. Tourism disaster planning and management: from response and recovery to reduction and readiness. Curr Issues Tourism. 2008;11(4):315–48. https://doi.org/10.1080/13683500802140372
21. Wang FF, Xiang KL, Qu H, Cui Y, Wu QY, Liu L, et al. Construction and implementation of the nursing safety and quality management system based on 4R crisis management theory. Chin Nurs Sci. 2017;32(5):52–5. https://doi.org/10.3870/j.issn.1001-4152.2017.05.052. Chinese.
22. DeVellis RF. Scale development: theory and applications. 3rd ed. Thousand Oaks: Sage Publication; 2011. p. 5–36.
23. Heath R. Crisis management for managers and executives. London: Financial Times Management; 1998. p. 1–20.
24. Lynn MR. Determination and quantification of content validity. Nurs Res. 1986;35(6):382–6. https://doi.org/10.1097/00006199-198611000-00017
25. Ma WJ, Pan B. The reliability and validity of the questionnaire and how to use SAS software to analyze. Chin J Health Statistics. 2000;17(6):45–6. https://doi.org/10.3969/j.issn.1002-3674.2000.06.017. Chinese.
26. Wu ML. Questionnaire statistical analysis practice - operation and application of SPSS. Chongqing, China: Chongqing university press; 2010. p. 140–230. Chinese.
27. Selby-Harrington M, Mehta SM, Jutsum V, Riportella-Muller R, Quade D. Reporting of instrument validity and reliability in selected nursing journals, 1989. J Prof Nurs. 1994;10(1):47–56. https://doi.org/10.1016/s8755-7223(05)80041-9
28. Hopkins M, Fetherston CM, Morrison P. Aggression and violence in healthcare and its impact on nursing students: a narrative review of the literature. Nurse Educ Today. 2018;62:158–63. https://doi.org/10.1016/j.nedt.2017.12.019
29. Evans W, Kelly B. Pre-registration diploma student nurse stress and coping measures. Nurse Educ Today. 2004;24(6):473–82. https://doi.org/10.1016/j.nedt.2004.05.004
30. Nau J, Dassen T, Halfens R, Needham I. Nursing students' experiences in managing patient aggression. Nurse Educ Today. 2007;27(8):933–46. https://doi.org/10.1016/j.nedt.2007.01.007
31. Celebioğlu A, Akpinar RB, Küçükoğlu S, Engin R. Violence experienced by Turkish nursing students in clinical settings: their emotions and behaviors. Nurse Educ Today. 2010;30(7):687–91. https://doi.org/10.1016/j.nedt.2010.01.006
32. Al-Ali NM, Al Faouri I, Al-Niarat TF. The impact of training program on nurses' attitudes toward workplace violence in Jordan. Appl Nurs Res. 2016;30:83–9. https://doi.org/10.1016/j.apnr.2015.11.001
33. Donna GG. The relationship of environmental constraints, self-efficacy, and company risk to occupational health nurses' intentions to provide violence prevention education training [doctor's thesis]. America: University of Kentucky; 1995.