

Development of Self-Rated Nursing Record Frequency for Delirium Care of Nurses in Acute Care Hospitals (NRDC-Acute)

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How to cite this paper: Hattori, K. and Matsuda, K. (2024) Development of Self-Rated Nursing Record Frequency for Delirium Care of Nurses in Acute Care Hospitals (NRDC-Acute). *Open Journal of Nursing*, 14, 412-420.

<https://doi.org/10.4236/ojn.2024.148028>

Received: July 10, 2024

Accepted: August 16, 2024

Published: August 19, 2024

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Abstract

Background: Nursing records play an important role in multidisciplinary collaborations in delirium care. This study aims to develop a self-rated nursing record frequency scale for delirium care among nurses in acute care hospitals (NRDC-Acute). **Methods:** A draft of the scale was developed after a literature review and meeting with researchers with experience in delirium care, and a master's or doctoral degree in nursing. We identified 25 items on a 5-point Likert scale. Subsequently, an anonymous self-administered questionnaire survey was administered to 520 nurses from 41 acute care hospitals in Japan, and the reliability and validity of the scale were examined. **Results:** There were 232 (44.6%) respondents and 218 (41.9%) valid responses. The mean duration of clinical experience was 15.2 years (SD = 8.8). Exploratory factor analysis extracted 4 factors and 13 items for this scale. The model fit indices were GFI = 0.991, AGFI = 0.986, and SRMR = 0.046. The Cronbach's alpha coefficient for the entire scale was 0.888. The four factors were named "Record of Pharmacological Delirium Care on Pro Re Nata (PRN)", "Record of Non-Pharmacological Delirium Care", "Record of Pharmacological Delirium Care on Regular Medication", and "Record of Collaboration for Delirium Care". **Conclusion:** The scale was relatively reliable and valid. Nurses in acute care hospitals can use this scale to identify and address issues related to the documentation of nursing records for delirium care.

Keywords

Acute Care Hospitals, Delirium Care, Nurses, Nursing Records, Scale Development

1. Introduction

Delirium is a disturbance of consciousness characterized by impaired attention

that develops in conjunction with an altered physical state. The incidence of delirium is reported to be approximately 10 - 30% in general wards, and 70 - 80% in intensive care units [1] [2]. Because the onset of delirium prolongs hospitalization and increases mortality [3], prevention of delirium and improving the quality of care after its onset are important issues.

Delirium is caused by a complex interplay between environmental and patient-specific factors. The main principles of delirium care involve addressing the causative factors and controlling symptoms using psychotropic medications, including antipsychotics. Delirium care is more effective when practiced in multiple disciplines, and guidelines suggest the need for multidisciplinary collaboration [4] [5].

Nursing records play an important role in information sharing among healthcare providers [6]. Therefore, nursing records play an important role in multidisciplinary collaborations in delirium care. However, there are no standard guidelines for nursing records related to delirium care in Japan or worldwide. Practical books on delirium care written for clinicians offer guidance; however, standardized protocols are lacking. In Japan, Kurokouchi outlined the need to document a patient's daily rhythm, content of delirium care provided, patient's response to temporarily prescribed medications, content of conferences, and assessment results using delirium assessment tools [7]. Previous studies on nursing records for delirium care mainly report on specific facility initiatives; however, the research on actual conditions in Japan or abroad is scant.

Therefore, we developed a scale to quantitatively evaluate the frequency of nurses' records in delirium care. We hope that this scale will provide basic data for identifying issues and improving measures to enhance the effective use of nursing records in delirium care.

2. Methods

2.1. Study Design

A cross-sectional study was conducted between November 2022 and October 2023.

2.2. Definition of Terms

In this study, "an acute care hospital" is defined as one having wards, intensive care units (ICUs), and intermediate care units (IMCUs) that receive acutely ill patients. "Ward nurses" are defined as those working in wards with departments generally considered prone to delirium. These departments include the cardiology, respiratory surgery, gastroenterology, neurology, cardiovascular surgery, respiratory surgery, gastrointestinal surgery, neurosurgery, and orthopedic surgery departments. "Nursing records" are defined as all records that ward nurses need to write in their respective facilities.

2.3. Creating Scale Items

The first step, conducted solely by the principal investigator, involved reviewing practical books on delirium care written for clinicians in Japan, articles on practical competence in delirium care [8] [9], and guidelines for nursing records [10]. Consequently, we found 25 items. In the second step, three researchers including two university faculty members (one nurse specialist in psychiatric nursing) with experience in delirium care and master's or doctoral degrees in nursing discussed the surface and content validity of these items multiple times. Ultimately, although some wording was modified for clarity, the number of items remained unchanged.

The recording frequency was rated on a 5-point Likert scale: 5 (always), 4 (often), 3 (sometimes), 2 (rarely), and 1 (not at all). The Likert scale was treated as an interval scale, with higher total scores indicating a higher recording frequency.

2.4. Study Subjects and Estimation of Required Sample Size

The participants in this study included nurses in an acute care hospital. To examine the factorial validity of the scale, a sample size of at least five respondents per item was necessary [11]. Since the draft scale comprised 25 items, we estimated a required sample size of 125 valid responses, based on the general response rate for questionnaires mailed to nurses in Japan [12] [13] [14]. Consequently, 187 of the 4,189 acute care hospitals in Japan, each with at least one department, were selected via simple random sampling. These hospitals were then verified on their respective websites to ensure that they were acute-care facilities.

2.5. Survey Method

We conducted a self-administered anonymous questionnaire survey via post mail. A research request letter detailing the study's purpose, methods, and ethical considerations, along with a response form, was sent to the directors of nursing departments at 187 facilities seeking cooperation. The letter, questionnaire, and a self-addressed return envelope were further distributed through the nursing departments to 520 nurses at 41 facilities, who agreed to participate. A letter addressed to the nurses included the details of the study purpose, methods used, protection of anonymity, and voluntary basis of participation.

2.6. Survey Contents

The questionnaire comprised two sections: (1) individual characteristics of the survey participants and the hospitals and wards (age, basic nursing education, graduated school of basic nursing, total years of clinical experience, and type of ward), and (2) the created scale items.

2.7. Analysis Methods

Valid responses were defined as those that met the following criteria: (1) All

items on the scale were answered, and (2) at least two-thirds of the remaining items were answered. IBM SPSS Amos Ver. 28 was used for confirmatory factor analysis to evaluate the model fit, and IBM SPSS Statistics Ver. 28 was used for all other statistical analyses.

The item analysis included endorsement frequency, discrimination index, and floor and ceiling effects, followed by item-total (I-T) correlation analysis. Items were excluded if endorsement frequency was $\geq 95\%$ or $\leq 5\%$, if the discrimination index was < 0.2 , if the mean score was < 1.5 or > 4.5 (floor and ceiling effects), or if the Spearman's rank correlation coefficient was > 0.7 or < 3 .

Factorial validity was assessed using exploratory factor analysis with the maximum likelihood method to estimate factor loadings, and promax rotation to facilitate interpretation. Items with factor loadings ≥ 0.4 for multiple factors were deleted. Factors were determined based on initial eigenvalues > 1 .

Internal consistency was evaluated using Cronbach's alpha coefficients for the entire scale and each factor. Model fit was assessed via confirmatory factor analysis using the unweighted least squares method, with AGFI, GFI, and SRMR determined to be adequate at $0.90 \leq \text{AGFI} \leq 1.00$, $0.95 \leq \text{GFI} \leq 1.00$, and ≤ 0.05 , respectively [15].

2.8. Ethical Considerations

This study was approved by the Teikyo Heisei University Ethical Review Committee (approval number: 2022-093-2). Following the Declaration of Helsinki, participants were informed that their participation in the study was voluntary, that the questionnaires were anonymous, that they would return the completed questionnaires individually, that the data collected would not be used for any purpose other than this study, and that the return of the questionnaires would be considered consent to participate in the study.

3. Results

3.1. Overview of the Survey Population (Table 1)

There were 232 (44.6%) questionnaire respondents and 218 (41.9%) valid responses. The mean age of the survey participants was 40.4 years (SD = 9.4), and the mean length of clinical experience was 15.2 years (SD = 8.8). Most respondents (72.5%) had graduated from nursing diplomas. Most nurses (93.6%) worked in general wards.

3.2. Item Analysis

Eight items had less than 5% of respondents selecting a particular option, all of which were in the "1. not at all" category. As it is unlikely that delirium care providers do not provide care at all, we concluded that the distribution of these eight items was within the expected range and decided not to delete them. Five items with a discrimination index below 0.2 were identified and deleted owing to their low discriminatory index. Three items were eliminated owing to floor ef-

fects. Additionally, an I-T correlation analysis was conducted on the remaining 17 items, resulting in the deletion of one item with a correlation coefficient above 0.7. Therefore, 16 items were retained for the draft scale.

Table 1. Overview of the survey population (N = 218).

	n	%	Mean ± SD
Age^a			40.4 ± 9.4
Graduated school of basic nursing			
Nursing diploma	158	72.5	
High school nursing course	18	8.3	
Bachelor's degree	25	11.5	
Junior College	15	6.9	
None	2	0.8	
Total years of clinical experience (years)^b			15.2 ± 8.8
Type of hospital ward			
General Ward	204	93.6	
ICU, IMCU	11	5.0	
Others	1	0.5	
None	2	0.9	

^a. n = 216, ^b. n = 214.

3.3. Factorial Validity by Exploratory Factor Analysis

An exploratory factor analysis was conducted on the 16 items of the draft scale, starting with an inter-item correlation analysis. One pair of items with correlation coefficients above 0.9 was identified; therefore, we retained the items deemed appropriate and important for delirium care. The Kaiser-Meyer-Olkin measure of sampling adequacy was .814, and Bartlett's test of sphericity was significant ($p < 0.001$), confirming the suitability of the 15 items for factor analysis. The first exploratory factor analysis did not reveal any items with factor loadings of 0.4 or higher, or items with cross-loadings. Therefore, we retained 13 items that converged on four factors (**Table 2**). Each factor was named based on the content of the included items: Factor I was "Record of Pharmacological Delirium Care on Pro Re Nata (PRN)", Factor II was "Record of Non-Pharmacological Delirium Care", Factor III was "Record of Pharmacological Delirium Care on Regular Medication", and Factor IV was "Record of Collaboration for Delirium Care".

3.4. Internal Consistency

The Cronbach's alpha coefficient for the entire scale was .888, with each factor ranging from 0.837 to 0.886.

3.5. Model Fit by Confirmatory Factor Analysis

The goodness-of-fit indices for the 13-item scale consisting of the four factors were GFI = 0.991, AGFI = 0.986, and SRMR = 0.046.

Table 2. Results of the factor analysis of the “self-rated nursing record frequency for delirium care of nurses in acute care hospitals (NRDC-Acute)” (N = 216).

Factor/items	Factor loading			
	I	II	III	IV
Factor I. Record of Pharmacological Delirium Care on pro re nata (PRN) ($\alpha = 0.846$)				
17. I record the nurse’s judgment of the effect after administration of a Pro Re Nata (PRN) for delirium.	0.964	-0.100	-0.078	0.052
16. I record change in the patient’s mental and physical status before and after the administration of a Pro Re Nata (PRN) for delirium.	0.798	-0.142	0.131	0.016
13. I record the nurse’s judgement regarding the timing of the administration of a Pro Re Nata (PRN) for delirium.	0.728	0.141	-0.042	-0.085
15. I record the reason for selecting the medicines to be administered as a Pro Re Nata (PRN) for delirium.	0.609	0.126	-0.035	-0.005
Factor II. Record of Non-Pharmacological Delirium Care ($\alpha = 0.882$)				
7. I record change in the patient’s physical and mental status before and after non-pharmacological delirium care.	0.003	0.862	0.029	-0.014
8. I record the nurse’s judgment of the effectiveness of the non-pharmacological delirium care implemented.	0.108	0.838	-0.018	-0.025
5. I record the nature of the non-pharmacological delirium care implemented.	-0.071	0.813	-0.003	0.043
Factor III. Record of Pharmacological Delirium Care on Regular Medication ($\alpha = 0.886$)				
10. I record change in the patient’s mental and physical status before and after the administration of regular medication for delirium.	-0.033	-0.045	1.044	-0.022
9. I record the time of administration of regular medication for delirium.	-0.100	0.078	0.742	0.029
11. I record the nurse’s judgment of the efficacy of regular medication for delirium.	0.156	0.045	0.733	-0.028
Factor IV. Record of Collaboration for Delirium Care ($\alpha = 0.837$)				
23. I record the reaction of the family members of patients requiring delirium care.	-0.011	-0.064	-0.012	1.008
24. I record intervention for family members of patients requiring delirium care.	-0.007	0.008	-0.008	0.905
22. I record discussion among nurses in the ward about delirium care.	0.019	0.211	0.006	0.472
Factor correlation matrix				
	Factor I	1.000	-	-
	Factor II	0.507	1.000	-
	Factor III	0.510	0.473	1.000
	Factor IV	0.429	0.381	0.413
Cronbach’s α coefficient for the total score = 0.888				

Factor patterns after unweighted least-squares promax rotation, factor loadings of 0.4 or more are shaded, α in the box of the factor name indicates the Cronbach’s α coefficient.

4. Discussion

4.1. Participants

The mean number of years of clinical experience among respondents was 15.2 years (SD = 8.8), indicating that we obtained responses from nurses with a wide range of experience levels. The reliability and validity of the 25 items on the draft

scale were assessed through item analysis, effecting the development of a scale consisting of 13 items grouped into four factors. This section addresses the reliability and validity of the scale, the applicability of the clinical situation of this scale, and the limitations of the study.

4.2. Scale Reliability

Reliability was assessed using Cronbach's alpha coefficient, which evaluates internal consistency. Regarding psychometric scale development, Cronbach's alpha should exceed 0.8 or 0.95 [16]. The Cronbach's alpha coefficients in this study were 0.888 for the entire scale and ranged from 0.837 to 0.886 for each factor, indicating acceptable internal consistency.

4.3. Validity of the Scale

Factor validity was assessed by examining the factorial validity. Exploratory factor analysis identified four factors and 13 items. A confirmatory factor analysis was further conducted to evaluate the goodness of fit of these 13 items across the four factors. The goodness-of-fit indices were GFI = 0.991, AGFI = 0.986, and SRMR = 0.046, indicating an acceptable fit. Therefore, the scale developed in this study, consisting of 13 items and four factors, is statistically supported.

4.4. Availability in Clinical Situation and Limitations of This Study

This scale allowed us to quantitatively evaluate how often nurses in acute care hospitals document delirium care-related nursing records. Specifically, the total score on the scale enables nurses to objectively assess the frequency of their own nursing record entries. Additionally, the numerical values of each item and factor on the scale helped nurses identify issues regarding the frequency of their nursing records. When used at the organizational level, this scale can serve as a tool for evaluating and improving the documentation of delirium care in nursing records.

This study is the first to investigate the frequency of nursing records related to delirium care. However, this study has several limitations that should be considered when interpreting and using the results. First, the scale captures only the recording status from the perspective of recording frequency. In future, qualitative evaluation methods for nursing records should be considered. Second, recall and social desirability biases may have influenced the responses to the questionnaire. Additionally, 90% of the respondents were nurses working in general wards, making it difficult to generalize the findings to nurses in intensive and intermediate-care units. Lastly, this scale reflects the frequency of nursing records based on nurses' practices in Japan, which should be considered when using this scale in other countries.

5. Conclusion

As a result of our study, we obtained a scale consisting of 13 items across 4 fac-

tors, which was statistically proven to possess a certain level of reliability and validity. The four factors were named: “Record of Pharmacological Delirium Care on Pro Re Nata (PRN)”, “Record of Non-Pharmacological Delirium Care”, “Record of Pharmacological Delirium Care on Regular Medication”, and “Record of Collaboration for Delirium Care”. Nurses in acute care hospitals can use this scale to identify and address issues related to the documentation of nursing records for delirium care.

Acknowledgements

We sincerely thank the nurses who participated in this study. We would like to thank Editage (www.editage.com) for English language editing.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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