



Original Article

Development of a self-evaluation scale of nursing practices for improving sleep quality among dementia patients taking sleeping pillsYuichi Iwamoto^{1*}, Narumi Fujino², Takaomi Furuno², Yuji Fujimoto²¹School of Nursing, Faculty of Medicine, Oita University, Yufu, Japan²Department of Nursing, Faculty of Medicine, Saga University, Saga, Japan

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ABSTRACT

Background & Aim: Many patients with dementia experience sleep-related issues. However, the nursing practices that address those issues are unclear. Therefore, to develop a self-assessment scale of nursing practices to improve sleep quality in patients with dementia taking sleep medication and confirm its validity and reliability.**Methods & Materials:** In this mixed-methods study, qualitative research was conducted by interviewing six expert-level nurses with a wealth of experience in caring for patients with dementia; then, quantitative survey questions were administered. The preliminary scale was created and evaluated its face validity. This quantitative study was conducted using questionnaire surveys among nurses with psychiatric ward experience employed at dementia treatment centers across Japan. Data from 525 nurses were used to verify the validity and reliability of the scale.**Results:** Exploratory factor analysis resulted in a three-factor, 16-item scale. Criterion validity was confirmed by calculating correlation coefficients with existing scales (the self-evaluation scale of oriented problem-solving behavior in nursing practice) as external criteria ($r = 0.574$, $p < .05$). The sum of scale scores and Cronbach's α coefficients for the three factors all exceeded 0.7.**Conclusion:** The development of this scale will improve the quality of nursing practice for patients with dementia who take sleeping pills. Additionally, it provides foundational research on nursing practice for the appropriate use of medications, as it offers evidence that nurses participate in drug treatment.**Introduction**

The number of patients with dementia worldwide was 57.4 million in 2019; this number is expected to reach 152.8 million by 2050 (1). The financial, social, and health-related costs of caregivers increase as symptoms of dementia become more severe (2). This burden of caregiving, coupled with the growing international costs of dementia, poses a significant challenge to the global healthcare system (3).

Sleep disturbances are closely linked to physical ailments (4). Aging is accompanied by marked changes in the sleep-wake rhythm caused by factors such as physical illness, decreased melatonin secretion, and

dysfunction of sleep-related neural pathways (5). Older adults with dementia are especially likely to fall into a lifestyle of limited socialization and minimal fluctuations in temperature or sound throughout the day owing to diminished senses, institutionalization, withdrawal from social activities, and cognitive impairment. These conditions are believed to render older adults with dementia vulnerable to circadian rhythm disturbances (6). Furthermore, many patients with dementia experience sleep disturbances (7).

These sleep-related symptoms are treated with psychotropic pharmacotherapy,



specifically benzodiazepines, and non-benzodiazepines. Hip fracture is one adverse event associated with these drugs, with such events being more likely to occur in older adults owing to age-related decline in physical functioning (8). Although sleep disturbances in patients with dementia should generally be treated with non-pharmacological interventions, in reality, multiple medications are often prescribed together or for long periods, which may cause further decline in cognitive function as an adverse event (9). Polypharmacy and potentially inappropriate medications are a challenge in pharmacotherapy for patients with dementia (10).

Regarding the principles for the appropriate use of medication, recent years have seen a compilation of guidelines and lists of drugs thought to be more harmful than beneficial for older adults (11). Doctors and pharmacists have begun to utilize frameworks such as the five steps of deprescribing (12). MATCH-D (a tool for evaluating the appropriateness of home dialysis) when providing pharmacotherapy. Interventions utilizing explicit standards, such as the Beers Criteria, are also important initiatives for the appropriate use of medications (13), which are primarily practiced by doctors and pharmacists. According to the Clinical Medication Review: A Practice Guide (14), doctors, pharmacists, and nurses are the primary practitioners of pharmacotherapy, and the appropriate way to use medication is to prescribe it with the patient's consent, to minimize drug-related issues and reduce unnecessary medications. Concerning nursing practices specifically, nurse practitioners (NPs) are primarily responsible for communicating and coordinating between the doctor or pharmacist and the patient, providing patients with information about their medications, and educating them on how to manage their medications (15). In recent years, the concerns with polypharmacy and potentially inappropriate medications were exacerbated among patients with dementia who could not properly communicate the pain

and subjective symptoms they experienced daily to healthcare professionals (16). To address this, nurses are taking the lead in providing psychological care and managing everyday life for patients with dementia (4). Thus, although nurses' practices are, in some ways, similar to those of doctors and pharmacists, they differ in that nurses' duties include ongoing monitoring of medications after prescription, multidisciplinary management, and education; therefore, there are some practices for the appropriate use of medications that only a nurse can perform.

There is a need for objective indexes and evaluations of nursing practices for patients with dementia, performed by nurses as generalists rather than as specialists with authority to prescribe medication (17). Such objective tools are necessary for nursing practices to improve sleep quality among patients with dementia, focusing on appropriate medication use. In recent years, a knowledge evaluation scale for patients with dementia has been developed (18), and a study on the current state of care competence and attitudes toward patients with dementia has been conducted (19). While some studies have reported on knowledge and intervention education regarding sleep disturbances in patients with dementia, other studies indicate a lack of practical nursing skills to care for patients with dementia (20). Therefore, there is a need for a scale that can evaluate nursing practice for patients with dementia.

A literature review was conducted, but no indicators were found to evaluate such nursing practices. Accordingly, this study aimed to develop the self-evaluation scale of nursing practices for improving sleep quality among patients with dementia who take sleeping pills (an evidence-based index of nursing practices and a tool for their evaluation). Developing this scale will improve the quality of nursing practice for patients with dementia who take sleeping pills. Additionally, this study provides the basis for nursing practices for the appropriate use of medications, as it offers evidence that nurses participate in drug treatment.

Methods

A survey of the literature did not reveal any indicators to evaluate such nursing practices. Accordingly, the self-evaluation scale of nursing practices for improving sleep quality among patients with dementia who take sleeping pills (an evidence-based index of nursing practices and a tool for their evaluation) as foundational research for the appropriate use of medications was developed.

Study type

This mixed-methods study involved both conducting qualitative interviews and administering quantitative survey items.

Creation of the preliminary scale

Phase 1: Qualitative interviewing

Interview surveys of six expert-level nurses with a wealth of experience in nursing practice for patients with dementia who take sleeping pills (e.g., ward supervisors and advanced practice nurses). In addition, descriptions of nursing practices for the appropriate use of hypnotics with patients with dementia were extracted, and the literature was surveyed from medical and pharmacological findings. The nursing practices obtained were extracted by applying them to Benner's framework of nursing practice (21). Based on the survey results, Benner classified competence in nursing practice into seven domains. Using this framework as a reference, we extracted descriptions of nursing practices, resulting in a pool of 226 descriptions. The expert panel was held with researchers specializing in home health, gerontological, and psychiatric nursing with experience in the practice and study of patients with dementia who take sleeping pills. 29 questions were developed regarding nursing practices for the appropriate use of hypnotics in patients with dementia. These questions were scored using a five-point Likert scale ("5: always true," "4: usually true," "3: not sure," "2: usually not true," and "1: never true").

Phase 2: Verification of Face Validity

A questionnaire survey using this preliminary scale was administered to 22 nurses with experience in nursing practice for patients with dementia who take sleeping pills, excluding nurses who had been part of the interview survey conducted when creating the preliminary scale. Participants were asked about any scale items that were difficult to understand and about nursing practices they performed which were not mentioned in the questions. Based on these results, an additional expert panel was convened wherein the questions were reviewed to create the 29-item scale, including 10 items with inappropriate wording that were corrected for the self-evaluation scale of nursing practices for improving sleep quality among patients with dementia who take sleeping pills for use in the present survey.

Participants

Participants were recruited using nonprobability sampling. The participants were nurses with psychiatric ward experience and experience in caring for patients with dementia who take sleeping pills at any of the 343 hospitals with dementia treatment centers (as of June 2021) across Japan. Nursing managers at facilities that agreed to participate were asked to recommend nurses who could answer the questionnaire.

It is recommended that the sample size is 10 times the number of indicators to be included in a single-factor analysis (22). Therefore, the number of participants was estimated based on that criterion.

Data collection method

Data collection was implemented in two stages. The target facility first approved this study, after which survey forms were distributed to eligible participants and collected. First, all facilities were sent a survey request document, and facility collaboration acceptance form addressed to the nurse manager. Nurse managers were instructed to return the consent form if they consented to participate. After returning the

consent form, they were asked to provide the total number of nurses who could participate in the survey. Next, facilities that returned the collaboration acceptance form were mailed an appropriate number of research explanation documents and survey forms. Anonymous, self-administered questionnaires were mailed back after completion. The survey period was from June 2021 to July 2021.

Survey content

Participants' background questions included sex, age, years of nursing experience, years of experience at a dementia care center, and whether they had nursing experience in a psychiatric ward.

In addition to the 29-item preliminary scale, the survey included the self-evaluation scale of oriented problem-solving behavior in nursing practice (five-point Likert scale, 25 items) (23). This scale is used as an external standard for the development of nursing practice rating scales in Japan and comprehensively assesses nursing competence in terms of five domains (exploring and identifying patients' problems by organizing and utilizing their data; alternating medication behavior to solve and reduce patients' problems, thereby reducing their symptoms; maintaining daily living functions; personalizing care; facilitating interactions to solve patients' problems; psychological support to help patients overcome their problems; and self-evaluation to solve patients' problems), and is used as an external criterion for the development of nursing practice evaluation scales in Japan. Higher scores indicate a higher quality of daily nursing practice. Nurses caring for patients with dementia refers to the decisions and practices required in the field. The scale states that individuals engaged in nursing work need to be capable of autonomous decision-making informed by professional knowledge and skill and should integrate correct nursing practices. This scale was selected to test criterion validity because many situations require nurses to make decisions and practices in nursing practice for patients with dementia.

Analysis method

Selection of valid responses

Valid responses were those with no missing data for the 29 questions regarding nursing practices for patients with dementia who take sleeping pills.

Item analysis

The exclusion criteria for the preliminary scale were as follows: items with a ceiling (mean + standard deviation > 5) or floor effect (mean - standard deviation < 1); items for which scores did not differ between the top 25% and bottom 25% groups for the total score on the 29 items in good-poor analysis using the Mann-Whitney U test; and items with coefficients of less than 0.4 in inter-item correlation using Spearman's rank correlation coefficient and item-total analysis.

Verification of validity and reliability

An exploratory factor analysis using the maximum-likelihood method and Promax rotation was performed to verify construct validity. Items with factor loadings of 0.3 or greater across multiple factors or less than 0.4 were excluded, and the factors created were named. The number of factors was determined based on the Kaiser-Guttman criterion. The criterion for sampling adequacy was a Kaiser-Meyer-Olkin (KMO) measure of 0.8 or above.

The normality of the scale's scores for each factor and overall was evaluated using the Shapiro-Wilk test.

To verify criterion validity, correlations between the total score on the newly developed scale and the total scores on the self-evaluation scale of oriented problem-solving behavior in nursing practice were calculated using Spearman's rank correlation coefficient.

To test reliability, Cronbach's α coefficients were calculated for the overall scale and each sub-factor to confirm internal consistency. Composite reliability (CR) was calculated and examined concerning the scale's reliability.

Analyses were performed using SPSS Statistics 28. Significance was set at $p < 5\%$ for all analyses.

Ethical considerations

This study was approved by the ethics review committee of the first author’s institution [details blinded for peer review]. The research explanation documents clearly stated the study purpose and method and the voluntary nature of participation (that there would be no disadvantages to non-participation or withdrawal and that personal information would be protected). Consent for the interview survey and facility approval was obtained in writing while returning a response was considered consent to the questionnaire survey.

Results

Number of Analyzed Responses and Participants

Consent for collaboration was obtained from 90 of the 343 facilities (consent rate: 26.2%). These facilities responded that 2211 nurses would be able to participate, and an appropriate number of survey forms were distributed. Responses were obtained from 1066 of these nurses (response rate: 48.2%), and 525 participants with nursing experience in psychiatric wards were included in the analysis (valid response rate: 95.8%).

Participant background

The participants included 370 women (70.5%) and 155 men (29.5%). The most common age group was 40–49 years (173 participants; 33%). Participants had an average of 19 years of nursing experience (standard deviation: 11.2) and an average of 11.7 years of psychiatric ward nursing experience (standard deviation: 9.4; Table 1).

Table 1. Participants’ attributes (N= 525)

| Demographic characteristics | | n (%) |
|-----------------------------|-------------|------------|
| Sex | Female | 370 (70.5) |
| | Male | 155 (29.5) |
| Age (years) | 20–29 | 77 (14.7) |
| | 30–39 | 96 (18.3) |
| | 40–49 | 173 (33.0) |
| | 50–59 | 149 (28.4) |
| | ≥ 60 | 29 (5.5) |
| | No response | 1 (0.1) |

Items may not add up to 100% because they have been rounded to the nearest decimal.

Item analysis

Ceiling or floor effects were not found for any item, and the good-poor analysis confirmed a significant difference for all

items. Four items were excluded because the inter-item and I-T correlation coefficients were less than 0.4. The remaining 25 items were adopted as variables for the factor analysis (Table 2).

Table 2. Item analysis of the 29 questions regarding nursing practices for improving sleep quality among dementia patients taking sleeping pills (N= 525)

| No. | Item | Mean | SD | I-T correlation coefficient | G-P analysis p-value |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|-----------------------------|----------------------|
| 1. | I check whether patients understand the reason for taking sleeping pills | 2.8 | 1.1 | .490 | < .001 |
| 2. | I monitor for abnormal sensations (e.g., itching) in the legs as a medication side effect | 3.0 | 1.1 | .523 | < .001 |
| 3. | When delirium occurs, I infer that sleeping pills are the cause | 3.0 | 0.8 | .416 | < .001 |
| 4. | I monitor for anxiety symptoms before bed that make it difficult to sleep | 3.7 | 0.8 | .432 | < .001 |
| 5. | <i>I adjust pillow height or bedding type as needed to improve sleep quality</i> | 3.2 | 1.1 | .489 | < .001 |
| 6. | <i>I monitor for poor physical condition using objective data (e.g., blood test results, physical assessment)</i> | 3.7 | 0.8 | .533 | < .001 |
| 7. | When nighttime lightheadedness occurs, I infer that sleeping pills are the cause | 3.9 | 0.7 | .236 | < .001 |
| 8. | <i>If sleeplessness persists, I consider adjusting the sleeping pills together with the attending physician</i> | 4.1 | 0.7 | .408 | < .001 |
| 9. | I get information about patients' participation in occupational therapy from the occupational therapist | 3.7 | 0.9 | .493 | < .001 |
| 10. | I get information regarding the medication instructions given to patients from the pharmacist | 2.8 | 1.1 | .508 | < .001 |
| 11. | If there is nighttime sleeplessness, I suggest the administration of as-needed medication | 3.8 | 0.9 | .236 | < .001 |
| 12. | I distribute sleeping pills according to patients' administration schedules from before admission | 3.1 | 1.1 | .366 | < .001 |
| 13. | If patients refuse to take sleeping pills, I respect their personal reason without forcing them to take anything | 3.8 | 0.8 | .360 | < .001 |
| 14. | I place familiar objects like calendars and pictures around the bed to prepare a peaceful and recuperative environment | 3.2 | 1.1 | .541 | < .001 |
| 15. | I incorporate interventions that help patients fall asleep (e.g., aromatherapy, massage) starting in the evening | 1.9 | 0.9 | .426 | < .001 |
| 16. | I encourage patients to change into comfortable clothing (e.g., a nightgown) before bed | 2.5 | 1.1 | .546 | < .001 |
| 17. | <i>I teach patients to avoid caffeine four hours before bed</i> | 2.8 | 1.2 | .495 | < .001 |
| 18. | <i>I establish a daily rhythm by providing morning care</i> | 3.8 | 1.0 | .459 | < .001 |
| 19. | I establish a circadian rhythm using indoor electric lights and sunlight | 4.0 | 0.9 | .472 | < .001 |
| 20. | I incorporate reality orientation therapy (e.g., asking about the date or current location) | 3.7 | 1.0 | .543 | < .001 |
| 21. | I incorporate content patients are interested in into their daytime activity program | 3.4 | 0.8 | .522 | < .001 |
| 22. | When daytime sleepiness or napping occurs, I infer that sleeping pills are the cause | 3.3 | 0.7 | .282 | < .001 |
| 23. | I do physical exercises and tasks together with patients to help them get out of bed during the day | 3.6 | 0.8 | .443 | < .001 |
| 24. | If a patient shows a refusal to participate in their daytime activity program, I respect what they are comfortable with and do not force them | 4.0 | 0.7 | .405 | < .001 |
| 25. | I set up opportunities for interaction with other patients aside from roommates | 3.5 | 0.9 | .411 | < .001 |
| 26. | <i>I perform deep breathing exercises and other activities together with patients to help them consciously relax</i> | 2.7 | 1.1 | .468 | < .001 |
| 27. | <i>When administering medications, I make sure to provide explanation centered on the effects of sleeping pills (e.g., "this is a medication that...")</i> | 3.5 | 1.0 | .568 | < .001 |
| 28. | I set up opportunities for patients to participate in medication management as much as possible (e.g., setting out the following day's medications) | 2.1 | 1.2 | .401 | < .001 |
| 29. | <i>I evaluate the effects of sleeping pills based on sleep and daytime activity</i> | 3.8 | 0.8 | .480 | < .001 |

I-T correlation: Spearman's rank correlation coefficient, G-P analysis: Mann-Whitney U test. SD = standard deviation. Items for which all inter-item correlation coefficients were less than 0.4 = *Italics*. Items for which the I-T correlation coefficient was less than 0.4 = **Bold**.

Verification of reliability and validity

Based on the Kaiser-Guttman criterion, exploratory factor analysis was performed with three factors (maximum-likelihood method, Promax rotation). Factor analysis was repeated after excluding items with factor loadings of 0.3 or greater across

multiple factors, or less than 0.4, resulting in the exclusion of nine items for a three-factor 16-item scale. The KMO score was 0.834 ($p < .05$; Table 3). Each factor was interpreted as follows:

Factor 1 included practices related to the effective introduction of rehabilitation, such as daytime activity programs and

Nursing practice scale

occupational therapy, and was thus named *Promoting daytime activities*.

Factor 2 included practices related to preparations for high-quality sleep while using sleeping pills, such as adjusting the environment of the patient's room and providing instructions on how to take medications and was thus named *Providing a high-quality sleep environment through the appropriate use of medication*.

Factor 3 included nursing practices directly related to the use of sleeping pills, such as practices to address symptoms of

sleep disturbance and clinical reasoning in response to adverse reactions to sleeping pills, and was thus named *Considering adverse events*.

The mean score for the overall scale was 50.6 points (standard deviation: 7.6), while the mean score for each factor ranged from 12.3 to 25.8 points (standard deviation: 2.6–3.8 points). The Shapiro-Wilk test results showed that the total scores for each factor were normally distributed (Supplementary Table S1).

Table 3. Exploratory factor analysis of the self-evaluation scale of nursing practices for improving sleep quality among dementia patients taking sleeping pills (n= 411)

| | Item | Factor 1 | Factor 2 | Factor 3 | Communality |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|-------------|
| Factor 1 Promoting daytime activities: Cronbach's α=.754 | | | | | |
| 21 | I incorporate content patients are interested in into their daily activity program | .647 | .097 | -.040 | .450 |
| 20 | I incorporate reality orientation therapy (e.g., asking about the date or current location) | .672 | .079 | .021 | .439 |
| 24 | If a patient shows a refusal to participate in their daytime activity program, I respect what they are comfortable with and do not force them | .580 | -.207 | .030 | .294 |
| 23 | I do physical exercises and tasks together with patients to help them get out of bed during the day | .571 | .053 | -.019 | .357 |
| 19 | I establish a circadian rhythm using indoor electric lights and sunlight | .505 | .094 | -.103 | .246 |
| 9 | I get information about patients' participation in occupational therapy from the occupational therapist | .495 | -.018 | .115 | .297 |
| 25 | I set up opportunities for interaction with other patients aside from roommates | .478 | -.118 | -.013 | .213 |
| Factor 2 Providing a high-quality sleep environment through the appropriate use of medication: Cronbach's α=.711 | | | | | |
| 28 | I set up opportunities for patients to participate in medication management as much as possible (e.g., setting out the following day's medications) | -.140 | .698 | -.102 | .371 |
| 16 | I encourage patients to change into comfortable clothing (e.g., a nightgown) before bed | .050 | .640 | -.030 | .407 |
| 15 | I incorporate interventions that help patients fall asleep (e.g., aromatherapy, massage) starting in the evening | -.061 | .554 | .050 | .304 |
| 14 | I place familiar objects like calendars and pictures around the bed to prepare a peaceful and recuperative environment | .167 | .511 | .007 | .358 |
| 10 | I get information regarding the medication instructions given to patients from the pharmacist | .019 | .419 | .198 | .322 |
| Factor 3 Considering adverse events: Cronbach's α=.654 | | | | | |
| 2 | I monitor for abnormal sensations (e.g., itching) in the legs as a medication side effect | -.052 | .014 | .797 | .578 |
| 4 | I monitor for anxiety symptoms before bed that make it difficult to sleep | .155 | -.134 | .512 | .303 |
| 3 | When delirium occurs, I infer that sleeping pills are the cause | -.084 | .022 | .464 | .224 |
| 1 | I check whether patients understand the reason for taking sleeping pills | -.020 | .263 | .430 | .357 |
| | Overall scale Cronbach's α | | | .801 | |
| | Kaiser-Meyer-Olkin | | | .834 | |
| | Inter-factor correlation | | | | |
| | Factor 1 | | .392 | .364 | |
| | Factor 2 | | | .569 | |

Maximum-likelihood method, Promax rotation.

Supplementary Table S1. Mean score, standard deviation, and normality testing for each factor of the self-evaluation scale of nursing practices for improving sleep quality among dementia patients taking sleeping pills (N= 525)

| Item | | Mean score | Standard deviation | Shapiro-Wilk test |
|-----------------|--------------------------------------------------------------------------------------|------------|--------------------|-------------------|
| Factor 1 | Promoting daytime activities | 25.8 | 3.8 | p < .01 |
| Factor 2 | Providing a high-quality sleep environment through the appropriate use of medication | 12.3 | 3.7 | p < .01 |
| Factor 3 | Considering adverse events | 12.5 | 2.6 | p < .01 |

Criterion and face validity

Both total scores and subfactors of the self-evaluation scale of nursing practices for improving sleep quality among patients with dementia who take sleeping pills all showed significant correlations with the scale selected as external criteria (the self-evaluation scale of oriented problem-solving behavior in nursing practice, $r = 0.574$, $p < .05$). Moreover, face validity was confirmed by consulting an expert panel of nursing researchers.

Next, construct validity was examined concerning both convergent and discriminant validity. The average variance extracted (AVE) was used for convergent validity. The AVEs of factors were 0.323, 0.328, and 0.324, respectively. Discriminant validity was tested by comparing the squares of AVEs and factor correlations. The AVE was higher than the square of inter-factor correlations among all factors, confirming discriminant validity.

Reliability

To test reliability, Cronbach's α coefficients were calculated for the overall scale and for each sub-factor to confirm internal consistency (Table 3). The Cronbach's α for the overall scale was 0.801. In addition, The CR values (0.642–0.767) were all above the standard values, confirming the scale's reliability.

Discussion

Participant attributes and data suitability

According to the nursing professional fact-finding survey (2017) conducted by the Japanese Nursing Association with all nurses

nationwide, most nurses were aged 40–49 years (29.3%) and had 10–19 years of experience as a nurse (30.2%). Most participants were in their 40s ($n = 173$, 33%) and had an average of 19 years of experience (standard deviation: 11.2), demonstrating that participants did not differ significantly from the national average. Thus, the participants have deemed a group closely resembling the target population. Furthermore, as the total scores for each factor of the scale developed in this study were normally distributed, the data were deemed suitable for use in testing the scale's validity and reliability.

Verification of the validity and reliability of the self-evaluation scale of nursing practices for improving sleep quality among dementia patients taking sleeping pills

Construct validity

Convergent validity was below 0.5 for each factor, and construct validity remained an issue. This may be owing to the lack of a theoretical framework for nursing practice related to the appropriate use of drugs. Thus, some issues remained regarding construct validity, and further research will continue to improve the scale's accuracy through further research. The discriminative validity of the scale has been verified.

Reliability

Cronbach's α coefficients for the total scale score and the three factors were 0.801, 0.745, 0.711, and 0.654, respectively, demonstrating internal consistency and thereby confirming its reliability. Consequently, The new scale was determined to be valid and reliable for the self-evaluation of nursing practices for

improving sleep quality among patients with dementia who take sleeping pills. In addition, the CR values (0.642–0.767) were all above the standard values, confirming the reliability of the scale.

Concepts comprising nursing practices for improving sleep quality among dementia patients taking sleeping pills

Promoting daytime activities, Providing a high-quality sleep environment through the appropriate use of medication, and Considering adverse events were extracted as the three factors comprising the new scale.

Promoting daytime activities included nursing practices that encouraged daytime activities and corrected the patient's daily rhythm. It is important to spend the daytime incorporating exercise and other activities to achieve high-quality sleep at night (24). In particular, evening exercise improves daytime alertness (25). Moreover, a systematic review of non-pharmacological interventions for improving sleep quality in older adults found physical activity and sensory stimulation to be effective methods (26). As discussed at the beginning of this study, non-pharmaceutical interventions are important because of the high sensitivity of patients with dementia to medication. These nursing practices are expected to improve sleep quality and, by extension, contribute to deprescribing and reducing excessive use of hypnotics. In doing so, multidisciplinary collaboration for daytime activities, as encompassed by this factor of the scale, is essential. Patients with dementia struggle to express their wishes because of a decline in cognitive function. Therefore, it is necessary to arrange activities concerning what is comfortable for the patient to participate in without pushing themselves too hard.

Efforts to change a patient's mood through relaxation with aromatherapy or hand massage and attempts to manage medication together with patients with dementia were described as *Providing a high-quality sleep environment through the appropriate use of medication*. Non-

pharmacological interventions effectively improve symptoms, particularly for behavioral and psychological symptoms of dementia (27)—a finding that supports our current results. In addition to non-pharmacological interventions regarding the sleeping pills patients with dementia are currently taking, it is important to encourage patients to participate in medication management and to share the status of medication instruction with their pharmacist, not only to ensure accurate administration but from an ethical perspective as well. Utilizing aromatherapy and relaxation to create a peaceful environment in combination with the effective use of hypnotics can improve sleep quality among patients with dementia.

Considering adverse events included nursing practices focused on adverse events that can occur in patients with dementia who take sleeping pills. Patients with dementia are susceptible to adverse reactions to medications; however, using sleeping pills is unavoidable. The importance of paying attention to adverse events is also discussed in polypharmacy, and it is all the more important when working with patients with dementia who have a limited ability to express their wishes. NPs also emphasize monitoring in the context of drug continuation, which supports the present results. To perform these nursing practices, it is essential that nurses understand the importance of appropriate medication use and monitor patients based on their knowledge of both the effects of sleeping pills and the associated adverse events. Such practices are considered key to ensuring the safety of patients with dementia who take sleeping pills.

The nursing practices discussed thus far aim to improve sleep quality through safe and effective use of sleeping pills in combination with non-pharmacological interventions. Practicing nursing based on these perspectives and thereby securing quality sleep for patients with dementia can be expected to prevent excessive use of sleeping pills and contribute to their deprescription. Doctors and pharmacists are primarily

responsible for the appropriate use of medications; however, our results demonstrate that nurses can also contribute to the appropriate use of hypnotics in patients with dementia.

Significance and applications of the scale

As noted, dementia rates are expected to continue climbing, making it imperative to enhance nursing practices to improve sleep quality among patients with dementia who take sleeping pills. The development of this scale is significant in that it allows nurses to objectively self-evaluate their practices for improving sleep quality among patients with dementia who take sleeping pills, identifying their challenges based on the results, and improving their nursing practice. In addition to reflecting on one's own nursing practice, the scale can be used as a tool for evaluating education programs for nurses who care for patients with dementia on a daily basis, thereby contributing to the improvement of nursing care for patients with dementia. Finally, because the constructs of the scale are supported by past research, it can also be used as an evidence-based index of nursing practices.

Limitations and future directions

The survey in this study targeted nurses, and no items accounted for dementia type, severity, or stage. Additionally, the survey did not account for physical complications or mention specific sleeplessness symptoms (e.g., difficulty falling asleep and waking up during the night). This wide target population may partially explain why many items were not used for scaling in this study. For example, the rate of participation in medication management differs according to dementia severity. Therefore, it is necessary to continue research focusing on narrowing down dementia and insomnia symptoms. Further research is needed to test whether the nursing practices identified in this study can improve sleep quality in patients with dementia and promote appropriate use of sleep medication, to confirm the test-retest reliability of the scale,

and to develop a scale that would allow third-party evaluation.

Conclusion

The self-evaluation scale of nursing practices to improve sleep quality among dementia patients taking sleeping pills was developed. It comprised four factors and 16 items. Our findings confirm its validity and reliability, thus demonstrating that it is a useful tool.

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Conflict of interest

The authors declare no conflict of interest.

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