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Effectiveness of educational video on standardized nursing language for nursing home nurses

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Abstract

Objectives: Developing nursing plans using standardized taxonomy offers for a better understanding of how nursing abilities affect the achievement of better levels of outcomes for NH residents. This study aimed to investigate the effectiveness of an educational video on standardized nursing languages (SNLs) developed for nursing home nurses.

Methods: We used a single group pre–post study design. We collected presurvey data from April 25 to June 22, 2022 and postsurvey data from May 23 to July 18, 2022. Sixteen nursing homes (NHs) participated in this study. We collected data on nurses' knowledge, perceptions, and attitudes towards SNLs and the evidence-based nursing practice self-efficacy. Analysis was conducted utilizing the McNemar test.

Results: The educational video about standardized nursing languages were provided to 31 registered nurses (RNs) from 16 NHs in Korea. Knowledge about the definition of SNLs and the benefits of their utilization improved after watching educational video.

Conclusions: Study findings support the effectiveness of educational videos on SNLs in increasing knowledge of SNLs, as well as confidence in the profession. To support NH nurses' professional development, ongoing SNL-focused education and research on innovative training methods like videos are recommended.

Implication for an international audience: Developing nursing plans using a common, standardized taxonomy offers a good chance to more clearly observe how nursing abilities affect the achievement of better levels of health and wellbeing. Education using audiovisual materials may help NH RNs learn how to utilize SNLs and may further enhance the development of SNL through periodic, long-term education and SNL-based nursing practice.

Keywords: educational videos; standardized nursing language; nursing homes; nursing

A standardized nursing language (SNL) is a terminology system that facilitates the application of a scientific nursing process by signifying that the practitioner objectively understands nursing phenomena and allowing the practitioner to describe patient concerns using standardized technical phrases [1]. SNLs allow for the objective understanding and description of patient concerns through the use of standardized technical terms [2]. SNLs provide valuable data for nursing research [3], leading to better nursing practices and management [4]. An SNL helps streamline the nursing process and provides a consistent approach to residents' care, which is particularly important in nursing homes (NHs) where residents require high-quality care [5]. Twelve standardized nursing terminologies have been designated by the American Nurses Association [6]. The SNLs include the 1North American Nursing Diagnosis Association-International (NANDA-I), Nursing Interventions Classification (NIC), Nursing Outcomes Classification (NOC), Clinical Care Classification System (CCC), Omaha System, Perioperative Nursing Data Set (PNDS), International Classification for Nursing Practice (ICNP), Systemized Nomenclature of Medicine Clinical Terms (SNOMED CT), Logical Observation Identifiers Names and

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Codes (LOINC), Nursing Minimum Data Sets (NMDS), Nursing Management Minimum Data Sets (NMMDS), and ABC Codes [6]. SNLs play a critical role in identifying residents' problems, health outcomes, and the necessary steps to achieve those outcomes, making them essential tools for improving residents' quality of care [5]. The use of SNLs in NHs can help in conducting quality monitoring and collecting data on the nursing process as it relates to NH residents in areas such as physiology, behavior, safety, family, health systems, and communities [7]. Unlike countries in Europe and the United States that have already taken steps to analyze and improve the quality of their NHs, Korea still faces challenges in effectively managing the quality of its long-term care facilities, including facilities' equipment, personnel, and healthcare programs [8]. Although government-led evaluations of quality are conducted in Korea's long-term care facilities every 3 years, the nursing records kept are mainly free-form, lacking the benefits of using SNLs to collect and integrate extensive information [9]. This underscores the need for Korea to embrace more advanced technologies and practices to enhance the quality of NHs.

The use of an SNL enhances nurses' evidence-based nursing practice and enables them to perform nursing procedures according to evidence-based practice guidelines to care for residents [10], thereby improving the quality of evidence-based nursing care [3]. This is because SNLs serve as the basis for generating evidence-based practice guidelines for nursing care [11]. The use of SNLs in the creation of evidence-based practice in acute cardiac care has been studied, and it has been shown that the NIC of interventions can be useful for nurse communication, and the NOC can be used as an indicator of the outcome of nursing care [5, 12] found that the use of an SNL in nursing practice improved NH residents' urinary incontinence, symptoms, and quality of life. However, most SNL education and application research has focused on nurses caring for patients with acute diseases, and there is little research on NH nurses caring for residents with chronic diseases [11]. To improve NH residents' quality of care, nurses must use SNLs, and additional effectiveness studies using SNLs are needed [4, 13]. Among the factors influencing nursing care performance, self-efficacy – a belief in one's ability to adequately perform the care required to complete a given task – is a significant predictor of nursing care performance [14]. When nurses use an SNL, their communication skills and self-efficacy improve [3, 11], and it has a positive effect on improving nursing knowledge and the nursing process [15]. To improve the quality of nursing in NHs, it is desirable to include an SNL in nursing education, which helps improve nurses' self-efficacy.

Considering the underuse of SNLs in NHs and complexity of applying SNLs in practical settings, videos of educational materials beyond current educational resources can provide effective, accessible information with low or no costs. Video-type educational materials have the potential to bridge the gap in the underutilization of SNLs in NHs. By providing accessible and cost-effective content, these videos can empower NH nurses to better integrate SNLs into their nursing care, ultimately improving the quality of care for NH residents [7, 15, 16]. Video-based education for NH nurses is primarily focused on managing and preventing residents' diseases. Studies have shown that video-based education for NH nurses improves the quality of dementia-related palliative care, self-efficacy, and attitudes [17]; knowledge and attitudes toward residents with dementia [18, 19]; knowledge, comfort, and self-awareness competencies related to Parkinson's disease medication safety [20]; the possibility of non-face-to-face education on wearing personal protective equipment in infection-risk situations [21]; enhancing pressure ulcer prevention practices [22, 23]; and reducing the number of antibiotic prescriptions for residents' urinary tract infections [24].

Video-based educational materials employ visual aids and practical demonstrations, making complex SNL concepts more understandable [25]. Nurses can learn at their own pace, ensuring comprehension and retention, while continuous updates keep them current with evolving standards [26]. Video-based education is useful that the systematic education approach to SNL practice nursing process and manage the quality of NHs [7, 15, 16]. Thus, we developed and provided an educational video for SNLs, targeting nurses working in NHs to bridge the research gap. The purpose of this study was to investigate the effectiveness an educational video on SNLs developed for NH nurses.

Methods

Study design

This study was a single group pre–post study.

Samples

This study was conducted as part of a larger parent project [27, 28]. For the parent study, we obtained a list of 686 NHs where RNs work from a comprehensive list of 3,850 NHs in Korea from the Korean Long-Term Care Insurance website. We excluded 3,164 NHs as they did not hire nurses, instead they hired certified nurse aids as the educational video was developed for nurses. We contacted the 686 NHs via their public email address, phone number, and mailing address. A total of 51 NHs decided to participate in the parent study. Sixteen out of 51 NHs decided to participate in this study. Thirty-one RNs in 16 NHs voluntarily consented to the study.

Development of an educational video on SNLs

The educational video was developed so that RNs in NHs can apply an SNL to residents by providing an educational module about the NHs' customized SNL system that is easy to understand. The research team reviewed nine domestic and international literature on NANDA-I, NIC, and NOC; 13 reports from related organizations targeting NHs; and developed a draft of educational materials and a script. In this process, the benefits of SNLs and frequently used NANDA-I, NIC, and NOC for NH nurses were identified. To provide efficient education on SNLs, the research team discussed education methods and materials and developed educational videos. The team for an educational video development consisted of a primary investigator, two research assistants, one undergraduate, one graduate nursing students and one professional video producer, dubbing artists, and one scripter of a video production company, YawL, in Korea. The videos' objectives and target audiences were defined through a literature review on SNLs and shared regularly throughout the development process with several meetings for 6 months. The format and lengths of the videos in total and subsections were discussed for optimized content. We provided whole scripts of documents to YawL. The script was developed and aligned with the scope and sequence of reviews of SNLs for NH nurses. We used a dubbing artist at YawL to dub the videos with accurate content delivery and comfortable listening as well as a professional animation studio. The educational videos are titled "Standard Nursing Language System" and include the definition and significance of SNLs (6 min), understanding of NNN linkages (2 min), application of NNN linkages to the nursing process in NHs (3 min), and visibility of SNLs and future implications (1 min). The team meticulously reviewed the content of SNLs, whether the videos match the narration, the appropriateness of the animation, and the effectiveness of the delivery and revised the initial draft several times. A review process was undertaken with nurses who had experience as NH RNs. We confirmed the content was understandable and the videos were interesting to watch. Feedback about videos was shared and discussed with the team, and edits were applied accordingly. The videos were registered on the GitHub platform for open access (https://github.com/juhshin/standardized-nursing-language-systes).

Data collection procedure

We collected presurvey data from April 25 to June 22, 2022 and postsurvey data from May 23 to July 18, 2022. First, research teams sent a personalized letter of invitation to participate by mail and email to 53 RNs from 16 NHs. The letter of invitation included the purpose and method of the study and introductory information about the educational videos with a consent form to be signed. Second, we requested that the 34 RNs who agreed to participate in the study take a prequestionnaire before watching the educational videos. Third, 1 week after

participating in the presurvey, we sent 34 RNs the URL to watch the videos (https://github.com/juhshin/standardized-nursing-language-systes) via e-mail or phone. We contacted and resolved the issue when there was a technical problem with watching the videos and sent participants a reminder to watch the videos. To decrease the contamination effect, after confirming all participating nurses watched the videos by email answers, we requested that the RNs complete a postquestionnaire 1 week after watching the educational videos. Three RNs who only participated in the presurvey were excluded, and finally, 31 RNs were included in this study. Collected data were assigned a unique identification number (ID), which was strictly confidential. A coded file was saved on a password-protected Excel file, of which only the research primary investigator and research assistant could access.

Measures

The questionnaire consists of three sections: (a) participants' general characteristics (gender, age, education, working experience both in NHs and in total); (b) knowledge, perceptions, and attitudes of SNLs; and (c) their self-efficacy in evidence-based nursing practice.

The instrument to measure nurses' knowledge, perceptions, and attitudes towards SNLs was developed by Olatubi et al. [1] and the evidence-based nursing practice self-efficacy (EBPSE) measure was developed by Tucker et al. [29]; which we were permitted to use [1]. "Use of Standardized Nursing Languages in Nursing Practice" instrument was used to measure RNs' knowledge, perceptions, and attitudes, as this is the only available instrument to measure knowledge, perceptions, and attitudes on SNLs. This tool consists of 33 items on knowledge, seven items on perceptions, and 19 items on attitude on SNLs. The scale also reported a good item-content validity index that ranged from 0.75–0.92 [1]. EBPSE consists of 17 items and each items describe activities that support and ensure evidence-based nursing practice.

The English SNL scale and EBPSE were translated into Korean by three Korean nursing researchers. Then, four bilingual nursing experts reviewed the Korean measure's content validity. This study used two methods (I-CVI and S-CVI/Ave) of calculating the content validity index to verify validity [30]. The relevance of each item was evaluated using a four-point Likert-type scale. The item-content validity index (I-CVI) was calculated as the proportion of experts who rated each item as either three (quite relevant) or 4 (highly relevant), divided by the total number of experts. The scale-content validity index/average (S-CVI/Ave) was determined by summing the I-CVI values for all items and dividing. by the total number of items. Good content validity, which ranges from 0 to 1, is indicated by S-CVI/Ave value of 0.8 or 0.9 or higher, and I-CVIs of 0.78 or higher. And items with I-CVIs below 0.70 are recommended for removal [30].

The S-CVI/Ave of the 59 items of the K-SNL was 0.92. During the validation process, five items with an I-CVI of less than 0.70 were removed from the scale. These items included: (a) comprehensive assessment, including 11 functional health patterns; (b) nursing diagnoses focused on the disease, injury, or disease process; (c) nursing diagnoses can be true, dangerous, or plausible; (d) nursing diagnoses exist in only two types: accurate or uncertain; and (e) the use of standard nursing terminology causes stress and anxiety to nurses. After eliminating these items, the final version of the K-SNL consisted of 54 items. The S-CVI/Ave of the 17 items of the K-EBPSE was 0.94, and three items had an I-CVI of below 0.70. However, two items were retained because it was deemed necessary to measure EBPSE. One eliminated item was locating resources in my department and institution necessary to institute an evidence-based practice change. Finally, we used the K-EBPSE, which consisted of 16 items. The instrument was tested for reliability. The reliability of EBPSE had a Cronbach's alpha from 0.95 to 0.98 and the K-EBPSE had a Cronbach's alpha of 0.97. The reliability of K-SNL had a Cronbach's alpha of 0.84.

We used 29 questions on knowledge, seven questions on perception, and 18 questions on attitude toward the use of K-SNL. Items on knowledge were answered with "yes," "no," or "I don't know," and we classified answers into correct or incorrect answers (including "I don't know"). Each item on perception and attitude was answered by the degree of agreement with a five-point Likert scale, and we reclassified it into agree and disagree for our analysis. The 16 items of K-EBPSE describe activities that support and ensure evidence-based nursing practice.

Participants assessed each of the 16 items using a scale ranging from 0 (not at all confident) to 100 (completely confident).

Ethical considerations

Prior to data collection, we obtained approval from the Institutional Review Board (IRB No. ewha-202108-0016-01). We explained the purpose, methods, benefits, and risks of the study; participants' freedom to withdraw; and confidentiality of personal information to nurses working in NHs. Then, we obtained informed consent from nurses who voluntarily wanted to participate.

Data analysis

We analyzed participants' general characteristics and their perceptions toward and use of SNLs using descriptive statistics such as frequency, mean, and standard deviation. We used the exact McNemar test to analyze changes in knowledge, perceptions, and attitudes of SNLs. We analyzed changes in self-efficacy in nursing practice based on evidence-based paired t tests. The SPSS 25.00 program (SPSS Inc, Chicago, Il, USA) was used for analysis.

Results

Participants' general characteristics

Table 1 shows the participants' general characteristics, and their awareness and utilization of SNLs. The mean age was 49.48 years (SD=10.28). Most participants were female (96.8 %) and had a bachelor's degree (80.7 %). The average NH working experience was 3 years and 7.56 months. About 68 % of participants did not know the concept of SNLs and 84 % of participants had never taken a theoretical class on SNLs. Among the 12 SNL systems designated by the ANA, 22 participants (71 %) recognized the International Classification of Diseases the most, and 11 participants (35.3 %) had used the International Classification of Diseases the most. On the contrary, SNLs with the lowest awareness were NMMAS (3.2 %), NMDS (3.2 %), and NOC (3.2 %). Most participants did not have regular in-service or continuous education about SNLs (90.3 %) and did not use a nursing process in their nursing practice (80.6 %).

Participants' knowledge, perceptions, and attitudes of SNLs before and after watching the educational videos

Regarding participants' knowledge of SNLs (Appendix 1), the percentage of correct answers increased significantly for four items after watching the educational videos: (a) An SNL allows for better communication with patients about care plans with other healthcare providers, patients, and patients' families (p=0.012); is a standard system for representing nursing interventions and outcomes (p=0.004); helping residents' care planning, scientific thinking, and analysis for residents' care (p=0.031); and the appropriate evaluation of nursing process assessment with goals (p=0.022). Among the perceptions of SNLs (Appendix 2), providing high-quality nursing care and having pride in their profession were marginally statistically significant (p=0.63). Table 2 shows participants' attitudes toward using SNLs before and after watching the educational videos. There were no statistically significant items, although the participants' attitudes generally changed positively.

Table 1: Participants' general characteristics, awareness, and utilization of standardized nursing languages (n=31).

Variables	Mean ± SD	Range	n	%
Age	49.48 ± 10.28	28–67	31	
Gender				
Male			1	3.2
Female			30	96.8
Education				
Bachelor's degree			25	80.7
Master's degree			5	16.1
Doctoral degree			1	3.2
Working experience in NH, year	3.63 ± 4.12	1–18		
Total working experience, year	18.30 ± 9.46	1–40.17		
Concept of SNL				
No			21	67.7
Yes			10	32.3
Sources of information on SNL				
School			4	12.9
Ward			4	12.9
Seminar			3	9.7
Others			2	6.5
I have theoretical class on SNL				
No			26	83.9
Yes			5	16.1
Sources of theoretical class on SNL				
School			4	12.9
Ward			1	3.2
Seminar			1	3.2
Others			0	0.0
I have ever recognized of				
International classification of diseases			22	71.0
Nursing intervention classification			12	38.7
The Omaha system			7	22.6
Systemized nomenclature of medicine clinical terms			6	19.4
International classification for nursing practice			5	16.1
NANDA international			5	16.1
Logical observation identifiers names and codes			4	12.9
Perioperative nursing data set belong to SNL			2	6.5
ABC codes			2	6.5
Nursing management minimum data set			1	3.2
Nursing minimum data set			1	3.2
Nursing outcomes classification			1	3.2
I use SNL				
Often			0	0.0
Sometimes			9	29.0
Seldon			13	41.9
Never			9	29.0

Table 1: (continued)

Variables	Mean ± SD	Range	n	%
I think that the SNL represents nursing practice				
Yes			7	22.6
No			2	6.5
I don't know			22	71.0
We have regular in-service or continuous education of SNL				
Yes			3	9.7
No			28	90.3
I use nursing process in NH				
Yes			6	19.4
No			25	80.6
I use nursing process at work.				
Yes			1	3.2
No			30	96.8
I have ever used of				
International classification of diseases			11	35.5
Systemized nomenclature of medicine clinical terms			5	16.1
Nursing intervention classification			5	16.1
Logical observation identifiers names and codes			3	9.7
NANDA International			3	9.7
Perioperative nursing data set belong to SNL			2	6.5
The Omaha system			2	6.5
International classification for nursing practice			2	6.5
ABC codes			1	3.2
Nursing management minimum data set			1	3.2
Nursing minimum data set			0	0.0
Nursing outcomes classification			0	0.0

NH, nursing home; SNL, standardized nursing language.

The evidence-based nursing practice self-efficacy of participants before and after watching the educational videos

Table 3 shows the changes in participants' evidence-based nursing practice self-efficacy. The average EBPSE scale score was 58.82 (SD=17.13) before and 59.29 (SD=17.41) after watching the educational videos. However, there were no statistically significant items.

Discussion

This study aimed to investigate the effectiveness educational videos on SNLs developed for NH nurses. To the best of our knowledge, these are the first educational videos on SNLs in Korea. This study highlights the significance of using SNLs when researchers and NH nurses apply the nursing process to improve residents' care, particularly focused on training RNs on the use of SNLs.

This study alarmingly found that most RNs in NHs did not know how to use SNLs or apply nursing processes or evidence-based practices without any formal educational sources both in academic and practical settings. In

Table 2: Participants' attitudes on utilizing a standard nursing language before and after watching the educational videos (n=31).

Variables	Category	Before		After		McNemar test
		n	%	n	%	p-Value (2-sided)
Use of SNL makes nurses speaks with common language	Agreed	30	96.8	29	93.5	1.000
	Disagreed	1	3.2	2	6.5	
SNL makes nurses more enthusiastic with their work	Agreed	20	64.5	23	74.2	0.375
	Disagreed	11	35.5	8	25.8	
Use of SNL allows for ease of documentation	Agreed	26	83.9	30	96.8	0.125
	Disagreed	5	16.1	1	3.2	
SNL will cause my work to be delayed	Agreed	4	12.9	3	9.7	1.000
	Disagreed	27	87.1	28	90.3	
SNL is only a theory work which is suitable for teaching but not actual practice	Agreed	3	9.7	3	9.7	1.000
	Disagreed	28	90.3	28	90.3	
SNL is boring	Agreed	2	6.5	4	12.9	0.500
	Disagreed	29	93.5	27	87.1	
SNL utilization causes nurses to lose freedom in their work	Agreed	1	3.2	0	0.0	NA
	Disagreed	30	96.8	31	100.0	
SNL utilization can only be applicable in some clinical area	Agreed	3	9.7	3	9.7	1.000
	Disagreed	28	90.3	28	90.3	
SNL utilization causes stress and anxiety to nurses	Agreed	4	12.9	3	9.7	1.000
	Disagreed	27	87.1	28	90.3	
SNL utilization means more work to do	Agreed	8	25.8	8	25.8	1.000
	Disagreed	23	74.2	23	74.2	
SNL utilization makes nurses spend more time in writing reports and unable to provide close care to patients	Agreed	5	16.1	3	9.7	0.625
	Disagreed	26	83.9	28	90.3	
Use of SNL is time consuming	Agreed	8	25.8	6	19.4	0.727
	Disagreed	23	74.2	25	80.6	
Adequate number of staff should first be ensured before talking of SNL	Agreed	19	61.3	22	71.0	0.453
	Disagreed	12	38.7	9	29.0	
SNL can only be done when the books are available	Agreed	3	9.7	4	12.9	1.000
	Disagreed	28	90.3	27	87.1	
Books required for SNL are really expensive	Agreed	5	16.1	2	6.5	0.375
	Disagreed	26	83.9	29	93.5	
Use of SNL is less time consuming	Agreed	4	12.9	7	22.6	0.508
	Disagreed	27	87.1	24	77.4	
SNL involves rigorous training	Agreed	23	74.2	25	80.6	0.727
	Disagreed	8	25.8	6	19.4	
SNL requires expertise for effective utilization	Agreed	22	71.0	26	83.9	0.289
	Disagreed	9	29.0	5	16.1	

SNL, standardized nursing language.

addition, more than 80 % of participants in this study indicated that SNLs require thorough education and expertise. In previous studies, the lack of SNL use was due to inadequate knowledge about SNLs and the absence of educational programs or opportunities [31]. The improvement and application of knowledge about SNLs did not improve only with theoretical knowledge and experience acquired in school [32]. Formal and nonformal education provides sufficient intellectual, technical, and interpersonal skills for correct nursing documentation. It provides new and broader ideas and insights for nurses to provide examples of good nursing care, thus influencing others [33]. Therefore, continuing education and regular in-service training on SNLs are crucial for their application to nursing practice and documentation.

Participants' awareness of the NMMDS, NMDS, and NOC were lacking in this study. The NMMDS is key to helping nurse managers make decisions and compare nursing practice across institutions and geographical areas

Table 3: Participants' evidence-based nursing practice self-efficacy before and after watching the educational videos (n=31).

Variables	Before Mean ± SD	After Mean ± SD	t	p-Value
Routinely ask questions about my practice	66.42 ± 20.69	68.39 ± 18.64	−0.724	0.474
Locate resources in my department and institution to facilitate my understanding of research literature relevant to my nursing practice	60.26 ± 24.35	61.77 ± 24.31	−0.385	0.703
Locate and review published practice guidelines that support nursing interventions important to my practice	62.52 ± 19.40	60.65 ± 22.35	0.687	0.497
Locate and review published research studies that have relevance to nursing interventions important to my practice	50.58 ± 21.32	48.39 ± 21.46	0.870	0.391
Organize the necessary support and procedures to make a nursing practice change based on evidence (research, clinical practice guidelines, clinical expertise, patient goals/ preference)	51.29 ± 22.47	50.00 ± 21.76	0.486	0.630
Routinely identify patient outcomes to target nursing interventions	64.03 ± 20.51	64.35 ± 20.85	−0.117	0.908
Integrate the various sources of evidence and apply to my specialty population and practice	64.19 ± 18.93	63.87 ± 21.24	0.109	0.914
Activate the processes to implement an evidence-based practice change	57.35 ± 18.14	54.19 ± 19.96	1.231	0.228
Modify nursing interventions recommended for my patient population based on characteristics of the specific unit in which I work	61.23 ± 17.16	65.16 ± 16.91	−1.384	0.177
Routinely evaluate the research literature and other sources of evidence related to nursing interventions for my specialty population and practice	45.97 ± 24.44	50.16 ± 24.17	−1.222	0.231
Routinely implement nursing interventions that are supported by evidence (research and other sources such as practice guidelines) for my patient population and practice	57.42 ± 18.97	58.71 ± 16.88	−0.447	0.658
Modify nursing interventions I routinely implement based on what I learn about my patient's preference	65.10 ± 17.59	63.55 ± 19.42	0.521	0.607
Routinely modify nursing interventions based on outcomes and goals	61.71 ± 20.10	62.74 ± 21.90	−0.305	0.763
Routinely evaluate the effectiveness of nursing interventions using measurable outcomes	61.55 ± 20.74	60.97 ± 24.13	0.185	0.855
Obtain proper training and education to be able to effectively implement an evidence-based nursing intervention or practice	53.87 ± 20.76	54.19 ± 23.21	−0.100	0.921
Implement an evidence-based nursing intervention individualized to my patient/family situation without losing the fidelity of the intervention (i.e., delivering as it was intended to be delivered)	57.68 ± 19.34	61.61 ± 18.28	−1.406	0.170

[34]. The NMMDS emphasizes the context of care to describe the overall environment or experience of home care, acute care, long-term care, and outpatient care. Thus, incorporating elements of the NMMDS into long-term care settings can provide evidence to measure and manage decisions that result in better patient care, staffing, and financial outcomes. NMDS was proposed to systematically describe nursing [35]. This system can assess the cost and quality of medical services as well as nurses' workloads [36]. Nursing diagnoses, interventions, and outcomes, as well as their impact on direct patient care, can be highlighted using minimal data sets [37]. The NOC is a comprehensive and standardized classification that evaluates patients' outcomes related to nursing interventions performed by nurses in all healthcare settings and nursing specialties [38]. Therefore, the use of NOC helps document the value of care for NH residents and the importance of resident-specific interventions. The participants in this study were primary RNs without managerial duties and did not have enough knowledge of SNLs related to managerial roles. However, having a knowledge base related to these SNLs would be helpful both bedside nurses and nurses in leadership roles in their organizations. Increasing RNs' understanding of these SNLs could establish standards that are consistently applied to nursing management, financial evaluation, and the assessment of nursing quality in NHs [39]. This would ultimately contribute to improved organizational performance and resident care outcomes in NHs.

In this study, after providing a video about SNLs to RNs in NHs, the RNs' perception of two items marginally increased, suggesting that utilizing SNLs could facilitate aspects of providing high-quality nursing services and enhance pride in their profession. According to a previous scoping review [16], studies evaluating

the perceptions and experiences of healthcare professionals using SNLs found that NANDA-I improved nurses' ability to identify diagnoses and interventions, enhanced the accuracy of their documentation, and facilitated communication across disciplines [40–42]. In Korea, research on the validation of an SNL and its utilization in nursing practice is primarily focused on acute care settings and still very few studies in long term care settings [43–45]. However, the use of SNLs in NHs is necessary and timely because SNLs are an important tool for improving evidence-based nursing care by assisting in the identification of residents' health problems, suitable interventions, and nursing outcomes as well as in monitoring the quality of care provided to residents. To use of SNL, it is crucial to first recognize the importance, strengths, and benefits of SNL. Furthermore, for continued use of SNLs, consistent integration of the language in nursing practice, education, and research is required.

The items with the highest frequency of increase after participants watched the educational videos on SNLs were ease of documentation, provision of high-quality nursing care, and confidence in the profession. In previous studies, the use of an SNL had a significant effect on the quality of nursing documentation and increased descriptions of nursing interventions and outcomes, quality of care, and knowledge creation [1, 16, 46]. Nursing documentation is essential for communicating a patient's needs, reacting to nursing interventions, and establishing a resident's current health status. The use of an SNL has various benefits, including consistent and clear resident data sharing, increased visibility of nursing interventions, adherence to consistent modalities of care standards, and safe and efficient resident care [47]. On the other hand, understaffing, overworking, and relative long-term stays compared to patients in acute-care settings have been suggested as possible causes of poor documentation [48]. Another study determined that it was difficult to use an SNL in practice due to the lack of clarity, ease of use, and usefulness of the language system regardless of nurses' academic backgrounds, experiences, and considerable levels of knowledge [49]. Therefore, it is necessary to review the academic and clinical training given to nurses in NHs and seek innovative ways to use an SNL to improve the situation.

In this study, after watching educational videos on SNLs, some of the participants' knowledge increased significantly. Some items positively changed participants' attitudes toward SNLs, although they were not statistically significant. Self-efficacy should be increased in applying evidence-based nursing interventions. In a systematic review evaluating the effectiveness of SNLs, the use of an SNL increased nurses' knowledge and changed nurses' attitudes toward education and guidance, which facilitated the clinical application of an SNL [3]. The average EBPSE scale score increased slightly after participants watched the educational videos in this study. Evidence-based nursing practice promotes nurse autonomy, clinical decision-making, and self-efficacy [14]. Some studies have demonstrated that continuing education and educational interventions increase nurses' self-efficacy [10, 15, 50]. EBP competency acquisition through an SNL should increase nurses' confidence in their use of EBP so that nurses who care for patients develop a sense of ongoing self-efficacy. This allows nurses to provide standardized care, ensuring better standards of care and the best possible health outcome. More research is required to confirm this finding. Educational interventions improved primary healthcare providers' knowledge, attitudes, and practices [51]. In particular, audiovisual materials can engage learners in audiovisual media to provide rich surrogate experiences in addition to actual experiences, stimulate human sense organs to be effective in accepting information, and motivate learners to improve their efficiency and depth of learning [52]. In this context, education using images for efficient information provision and nursing education has been increasing recently in the healthcare field, including nursing [26]. Therefore, the development of educational programs in NHs using various media is emphasized for accurate knowledge and the application of SNLs. However, in this study, education through an educational video comprised of only one session, so only some knowledge and recognition were effective. Compared to knowledge and awareness, attitude change can be seen as requiring periodic and long-term education. This study tried to offset this limitation in that it registered in the GitHub platform so that any RNs could access the educational videos. In the future, we suggest educators and scholars provide more educational strategies with high technology about SNLs.

Implication for an international audience

Developing nursing plans using a common, standardized taxonomy offers a good chance to more clearly observe how nursing abilities affect the achievement of better levels of health and wellbeing. Future studies to further enhance the creation of SNLs via SNL-based nursing practice will commence with the establishment of the SNL nursing education program. Continuing education on SNL is important for applying SNL to nursing practice and documentation and can positively impact nursing practice. It promotes accurate recording, provides high-quality nursing care, and enhances professional pride. Education using audiovisual materials may help NH RNs learn how to utilize SNLs, and it is necessary to develop educational programs using various media as a way to educate NH nurses on SNL knowledge and its application.

Limitations

This study has several limitations. First, this study is also limited because it used a single group pre-post design without a control group. Therefore, this study was unable to establish causality definitively and did not account for potential confounding variables that may influence observed outcomes over time. Second, due to the limited number of RNs and NHs participating in this study, there is a risk that the sample may not accurately represent the target population, limiting the generalizability of the study findings. Furthermore, the NHs included in our study were not nationally representative, indicating a potential for selection bias. Finally, we did not account for several confounding variables that could potentially influence the study outcomes. These variables include the education level and years of experience of RNs, the health status and complexity of residents, facility size and type, and variations in nursing record systems. Therefore, caution is required when interpreting the results.

Conclusions

This study aimed to investigate the effectiveness of an educational video on standardized nursing languages (SNLs) developed for NH nurses. This study suggests the need for knowledge augmentation and utilization through continuing education on SNLs and demonstrated that educating NH nurses using training videos on SNLs is a viable way to improve some knowledge and awareness. These results underscore the importance of ongoing education and training initiatives focused on SNLs to promote knowledge enhancement and utilization among NH nurses. In addition, further research and development in educational approaches like video-based training are recommended to continue supporting the professional development and competency of NH nurses.

Informed consent: Informed consent was obtained from all individuals included in this study.
Author contributions: All authors have accepted responsibility for the entire content of this manuscript and approved its submission. Conceptualization: SOJ; data curation: SOJ, JHS; formal analysis: SOJ, JHS; funding acquisition: JHS; investigation JSL, SOJ; methodology: SOJ, JHS; project administration: JHS; resources: JSL, SOJ, JHS; software: JSL, SOJ; supervision: SOJ, JHS; validation: JSL, SOJ, JHS; visualization SOJ; roles/writing – original draft: JSL, SOJ; writing – review & editing: JSL, SOJ, JHS.
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Data availability: The raw data can be obtained on request from the corresponding author.

Appendix 1: Participants' knowledge on a standard nursing language before and after watching the educational videos (n=31)

Variables	Category	Before		After		McNemar test
		n	%	n	%	p-Value (2-sided)
SNL is a systematic method used by nurses to discover patient problems and provide quality care for them	Correct	22	71.0	31	100	NA
	Incorrect	9	29.0	0	0.0	
SNL allows nurses to communicate with other health care providers, patients and patient families about the patient's treatment plan	Correct	19	61.3	28	90.3	0.012[a]
	Incorrect	12	38.7	3	9.7	
SNL is a standard system that indicates interventions and outcomes for health examinations within the nursing field	Correct	21	67.7	30	96.8	0.004[b]
	Incorrect	10	32.3	1	3.2	
SNL assists nurses in planning, scientific thinking, and analysis for patient care	Correct	24	77.4	30	96.8	0.031[a]
	Incorrect	7	22.6	1	3.2	
SNL is a language system that can be individually applied to holistic and effective patient care	Correct	22	71.0	28	90.3	0.109
	Incorrect	9	29.0	3	9.7	
The nursing process consists of five stages	Correct	17	54.8	19	61.3	0.754
	Incorrect	14	45.2	12	38.7	
Nursing assessment precedes nursing diagnosis, outcome, and intervention	Correct	30	96.8	30	96.8	1.000
	Incorrect	1	3.2	1	3.2	
Nursing assessment is comprehensive, intensive, and continuous	Correct	25	80.6	26	83.9	1.000
	Incorrect	6	19.4	5	16.1	
Focused assessment focuses on a specific health problem and is performed when additional assessment is needed for a specific symptom	Correct	21	67.7	21	67.7	1.000
	Incorrect	10	32.3	10	32.3	
Nursing diagnosis relates to an individual's response to a current or potential health problem or life course	Correct	22	71	25	80.6	0.508
	Incorrect	9	29	6	19.4	
Nursing diagnosis provides the basis for nurses to select nursing interventions to reach responsible outcomes	Correct	29	93.5	29	93.5	1.000
	Incorrect	2	6.5	2	6.5	
Nursing diagnosis consists of interventions and risk factors	Correct	7	22.6	11	35.5	0.125
	Incorrect	24	77.4	20	64.5	
Nursing diagnosis is also called NANDA or diagnostic label	Correct	19	61.3	23	74.2	0.344
	Incorrect	12	38.7	8	25.8	
Secondary data collected during ejaculation include patient interviews and physical evaluations only	Correct	30	96.8	29	93.5	1.000
	Incorrect	1	3.2	2	6.5	
Primary data collected during an assessment include records collected from family members, other medical personnel, and medical records	Correct	19	61.3	18	58.1	1.000
	Incorrect	12	38.7	13	41.9	
Nursing diagnosis is maintained continuously throughout the hospitalization period and beyond	Correct	22	71.0	21	67.7	1.000
	Incorrect	9	29.0	10	32.3	
All nursing diagnoses include problems, causes, and symptoms	Correct	26	83.9	23	74.2	0.453
	Incorrect	5	16.1	8	25.8	
Nursing outcomes should be recorded after patient interviews	Correct	18	58.1	21	67.7	0.549
	Incorrect	13	41.9	10	32.3	
Nursing outcomes are based on both diagnosis and intervention	Correct	29	93.5	27	87.1	0.500
	Incorrect	2	6.5	4	12.9	
Nursing outcomes can only be established from a long-term perspective	Correct	29	93.5	25	80.6	0.125
	Incorrect	2	6.5	6	19.4	
Specific nursing interventions are planned at the planning stage	Correct	20	64.5	22	71.0	0.774
	Incorrect	11	35.5	9	29.0	
Mutual independent and dependent nursing interventions can be planned by the nurse	Correct	19	61.3	24	77.4	0.125
	Incorrect	12	38.7	7	22.6	
Independent nursing intervention is an intervention that can be performed under the authority of a nurse	Correct	25	80.6	24	77.4	1.000
	Incorrect	6	19.4	7	22.6	
Dependent nursing intervention is an intervention not planned by the nurse	Correct	25	80.6	23	74.2	0.687
	Incorrect	6	19.4	8	25.8	

(continued)

Variables	Category	Before		After		McNemar test
		n	%	n	%	p-Value (2-sided)
Independent nursing interventions require a doctor's prescription	Correct	4	12.9	2	6.5	0.625
	Incorrect	27	87.1	29	93.5	
Implementation is the implementation of the nurse's patient care plan	Correct	25	80.6	26	83.9	1.000
	Incorrect	6	19.4	5	16.1	
The evaluation of the nursing process is used to determine whether the patient has achieved his or her treatment goals	Correct	14	45.2	23	74.2	0.022[a]
	Incorrect	17	54.8	8	25.8	
Assessment is performed at the end of patient care	Correct	18	58.1	13	41.9	0.125
	Incorrect	13	41.9	18	58.1	
Assessments provide additional information about patient care	Correct	26	83.9	28	90.3	0.687
	Incorrect	5	16.1	3	9.7	

SNL, standardized nursing language. a = p<0.05 , b = p<0.01.

Appendix 2: Participants' perception on a standard nursing language before and after watching the educational videos (n=31)

Variables	Category	Before		After		McNemar test
		n	%	n	%	p-Value (2-sided)
The utilization of SNL helps nurses to provide high-quality nursing care	Agreed	23	74.2	28	90.3	0.063
	Disagreed	8	25.8	3	9.7	
SNL makes nurses become creative in solving patients' problems	Agreed	19	61.3	23	74.2	0.219
	Disagreed	12	38.7	8	25.8	
SNL enables nurses to use critical thinking	Agreed	20	64.5	25	80.6	0.125
	Disagreed	11	35.5	6	19.4	
Use of SNL can be cumbersome	Agreed	6	19.4	7	22.6	1.000
	Disagreed	25	80.6	24	77.4	
SNL cannot be practiced even with adequate staffing	Agreed	1	3.2	3	9.7	0.500
	Disagreed	30	96.8	28	90.3	
Use of SNL makes nursing practice unique	Agreed	15	48.4	18	58.1	0.508
	Disagreed	16	51.6	13	41.9	
Utilization of SNL makes nurses become proud of their profession	Agreed	22	71.0	27	87.1	0.063
	Disagreed	9	29.0	4	12.9	

SNL, standardized nursing language.

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