

Surface and Content Validity of an Advanced Beginner Nurse's Self-Monitoring Scale While Multitasking

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Abstract

Background: Self-monitoring is important for recognizing the situations one is facing and assessing one's own competence to respond appropriately to situations that require multitasking. **Purpose:** This study aimed to examine the surface and content validity of the Advanced Beginner Nurses' Self-Monitoring Scale While Multitasking and refine the scale items accordingly. It is expected that the development of such scale will allow for reflection on advanced beginner nurses' response to multitasking, leading to further capacity building. **Methods:** The surface validity of 96 items of the Advanced Beginner Nurses' Self-Monitoring Scale While Multitasking was examined at a meeting with five expert researchers. Five researchers and five nurses examined the items' content using an item-level content validity index through a questionnaire survey. **Results and Conclusion:** The Advanced Beginner Nurses' Self-Monitoring Scale While Multitasking was organized into 73 items that were refined into scales with surface and content validity. Consequently, five sub-concepts were identified: recognizing the situation one's facing, seeing one's self from multiple perspectives, devising concrete strategies depending on the situation, considering a predictable time schedule, and being aware of the situation surrounding one's self. In the future, it will be necessary to examine the reliability and validity of the scale.

Keywords

Advanced Beginner Nurses, Multitasking, Self-Monitoring, Refining the Scale Items

1. Introduction

Many jobs require high performance in multitasking and must respond to multiple

simultaneous demands [1]. In clinical settings, multitasking is inevitable in high-acuity environments, where healthcare providers care for multiple patients simultaneously [2]. Multitasking refers to the simultaneous performance of two or more tasks [3] [4]. Nursing activities include not only vital sign measurement and patient care, but also other tasks beyond the scope of nursing practice; they find the following to be difficult in relation to multitasking: “Being involved in every little task regarding patient care”, “Getting swamped by the complexity of symptoms and problems of the patients at a given time”, and “Getting interrupted at work too often” [5]. Work interruption due to multitasking may lead to work errors [6]; it has been suggested that increased workflow interruptions in electronic health record tasks increase nurses’ mental workload and impair their task performance [7]. The ability to question the effectiveness of healthcare practice and explore evidence is required from the time the student starts learning nursing, but the emphasis remains on the mastery of skills and practice [8] and not on multitasking with organizational and management skills [9]. This limited experience in basic nursing education causes newly graduated nurses to feel that they lack knowledge and are overwhelmed by the workload and rapid pace of the clinical environment [10]. Since they are focused on the task and routine at hand, they require assistance in making judgements in response to multitasking and changing patient situations [11]. Nurses in their second and third years also experience mental workloads due to multitasking [12]. Benner *et al.* defined the first- to second-year period before becoming a competent nurse as an advanced beginner nurse. They indicated that the first two years after licensure are spent improving the ability to understand clinical situations and provide personalized care while anticipating possible outcomes [13]. Therefore, it is important for advanced beginner nurses to cultivate the foundation of the ability to deal with multitasking through educational support.

To multitask, priorities must be determined based on an individual patient’s condition, symptoms, and treatment, as well as the severity of the patient’s illness and the urgency of the task [14]. In addition, deepening one’s understanding of one’s own nursing practice enables one to view themselves objectively and develop self-monitoring skills. This allows for recognizing the limits of their competence and makes it easier to request assistance from others [15]. This deliberate attention to aspects of one’s behavior [16] and the systematic and deliberate observation of covert and overt aspects of one’s performance on a given task [17] are referred to as self-monitoring in self-regulated learning. Zimmerman proposed a self-regulated learning model and showed that learning is promoted by adjusting one’s behavior based on the results of self-monitoring one’s thoughts and actions [18]. Self-monitoring occurs real time during clinical tasks, providing pertinent information to recognize errors, limitations, and feelings and guide remediation attempts on tasks [19]. Healthcare professionals can change their plans by learning about their weaknesses and recognizing their inability to complete tasks. Recognizing that they are “over my head” in particular situations allow them to

determine the need for resources such as “consulting”, “recruiting additional support”, or “delegating to others” [20]. In this study, we consider that nurses respond to multitasking by self-monitoring, which involves recognizing their own knowledge, thoughts, and actions and noticing the need for a change in plan or a request for assistance.

Nurses’ abilities to recognize situations and respond to emergencies are largely acquired by the third year after graduation [21]. Therefore, we consider that the advanced beginner period is a time when self-monitoring is consciously functioning and that support for self-monitoring will lead to an improved ability to deal with multitasking.

Based on the above, self-monitoring, which functions to recognize one’s own situation and identify the limits of one’s competence, is important for making appropriate decisions and responding appropriately in multitasking situations. Self-monitoring is an element that promotes the recognition of one’s own state and autonomous learning in the context of learning and is expected to be used in nurses’ learning in multitasking situations. However, to our knowledge, there is no scale for measuring self-monitoring during multitasking, and we are yet to understand the extent to which self-monitoring functions during multitasking. Therefore, this study examined the surface and content validity to refine scale items for the development of an Advanced Beginner Nurses’ Self-Monitoring Scale While Multitasking. We believe that the development of a self-monitoring scale for multitasking will aid in the growth of clinical thinking among advanced beginner nurses who are developing a foundation for coping with multitasking. This would be useful because it could serve as a tool for evaluating education and training related to multitasking.

2. Objective

This study aimed to develop an Advanced Beginner Nurses’ Self-Monitoring Scale While Multitasking by evaluating its surface and content validity.

3. Methods

3.1. Study 1: Surface Validity and Content Validity by Expert Meetings

A convenience sample of five nurses who met the following three criteria provided their cooperation: 1) at least five years of clinical experience as a nurse, 2) experience teaching first- and second-year nurses in a clinical setting, and 3) a nursing master’s degree or higher. In December 2021, an online format lasting approximately 120 min was used.

Ninety-six items extracted from an interview survey and a literature review on self-monitoring in multitasking for advanced beginner nurses were used as preliminary scale items. The interviews examined the scale’s validity, consistency, order, clarity, and ease of response. Interviews were recorded, and notes were taken with the approval of the research collaborators. The analysis was based on the

opinions obtained at expert meetings, and each concept and question item was revised and refined.

3.2. Study 2: Examination Using the Item-Level Content Validity Index (I-CVI)

A convenience sample of five nurses and five nursing researchers who met the following three criteria provided their cooperation: 1) at least five years of clinical experience as a nurse, 2) experience teaching first- and second-year nurses in a clinical setting, and 3) a nursing master's degree or higher. An anonymous, self-administered questionnaire was mailed to the participants to study the content validity of the preliminary scale items for the Advanced Beginner Nurses' Self-Monitoring Scale While Multitasking using the I-CVI. The study was conducted in March 2022.

The survey asked respondents to rate the scale items examined for surface and content validity in Survey 1 on a 4-point Likert scale: "entirely not relevant" (1 point), "somewhat relevant" (2 points), "quite relevant" (3 points), or "highly relevant" (4 points). The survey began with the following instructions: "Please select a response from '1. Entirely not relevant' to '4. Highly relevant' to indicate the extent to which each scale item is congruent with the scale category". For each item, the I-CVI was computed as the number of experts giving a rating of either three or four, divided by the total number of experts. If the I-CVI was less than 0.78, careful consideration was given, and either the revised or discarded version needed to be corrected or discarded [22]. Therefore, in this study, a score of 0.78 or higher was considered to indicate adequate content validity, and items with a score of less than 0.78 were removed from the preliminary scale.

4. Ethical Considerations

Both Studies 1 and 2 were conducted with the approval of the Research Ethics Committee of the researcher's institution. The requests sent to the participants included the purpose of the study, a summary of the survey, a statement that participation was entirely voluntary, explanations regarding how the study's results would be published, and how the confidentiality of personally identifiable information would be maintained. The study was conducted after obtaining participants' consent.

5. Results

5.1. Study 1

The study collaborators, two men and three women, had 7 - 13 years of nursing experience and 3 - 6 years of clinical teaching experience. Degrees earned two master's degrees and three doctoral degrees.

Ninety-six items extracted from an interview survey and a literature review on self-monitoring in multitasking for advanced beginner nurses were revised in

terms of concepts and definitions based on the content of expert meetings. Items that were considered misleading or difficult to understand by the respondents were revised, items with similar content were integrated, and items with multiple meanings were divided and added. The items that were inappropriate as concept items were excluded. After reorganization, the items were refined into five sub-concepts and 78 scale items. The five sub-concepts were: “recognizing the situation one’s facing”, “seeing one’s self from multiple perspectives”, “devising concrete strategies depending on the situation”, “considering a predictable time schedule”, and “being aware of the situation surrounding one’s self”.

“Recognizing the situation one’s facing” consists of 17 scale items pertaining to recognizing the situation a nurse is facing by checking the progress of one’s work and relating it to the information one is aware of. “Seeing one’s self from multiple perspectives” consists of 17 scale items about recognizing one’s own abilities by seeing one’s knowledge, skills, past experiences, and tendencies while multi-tasking. “Devising concrete strategies depending on the situation” consists of 23 scale items and is based on paying attention to one’s competence, the information one is aware of, and the options for action, and considering the criteria for deciding how to respond to changing situations. “Considering a predictable time schedule” consists of 12 scale items on considering the time schedule by observing the development of one’s own actions, changes in circumstances, and anticipating the overlap of tasks. “Being aware of the situation surrounding one’s self” consists of nine scale items and pertains to paying attention to the work situation and work environment of people around oneself.

5.2. Study 2

The surveys were mailed to five nurses and five nursing researchers who agreed to participate in the study. Valid responses were received from all participants. The study collaborators, one male and nine females, had between 6 and 34 years of nursing experience and between 2 and 31 years of clinical teaching experience. The nursing departments included pediatrics, obstetrics and gynecology/neonatal intensive care units, intensive care units, gastroenterological surgery, and internal medicine. Six master’s degrees and four doctoral degrees were earned. Of the five nursing researchers, one had a master’s degree and four had doctoral degrees. All five nurses had master’s degrees.

The I-CVI scores were calculated to assess the content validity. Of the five sub-concepts and 78 items of the preliminary scale, items with a value of 0.78 or higher were adopted. In the “recognizing the situation one’s facing”, two items (“3. Thinking of where I am and what I am doing to report my situation” and “9. Paying attention to information about individual patient personalities to predict risk”) were not adopted, resulting in 15 items. In the “seeing one’s self from multiple perspectives”, one item (“34. Recognizing the differences between own behavior and theirs by comparing own behavior with that of fellow nurses”) was not accepted, resulting in 16 items. In “devising concrete strategies depending on the

situation”, two items (“41. Thinking about needs of the patient’s family when prioritizing” and “42. Being aware of the need to cooperate with others in a team to ensure patient safety”) were not selected, resulting in 21 items. There were no rejected items in the 12 items of “considering a predictable time schedule”, and the nine items of “being aware of the situation surrounding one’s self”. Based on the above, after reviewing the I-CVI, five items were rejected, and 73 items were adopted (**Table 1**).

Table 1. Results of a measurement of the items in the Advanced Beginner Nurses’ Self-Monitoring Scale While Multitasking by I-CVI.

No.	Sub-concepts and items	Adopted items I-CVI	Removed items
Recognizing the situation one’s facing			
1	Trying to visualize and check the progress of the entire operation by utilizing memos	1.0	
2	Checking the time schedule against the progress of the work to see if it deviates from the scheduled time	1.0	
3	Thinking of where I am and what I am doing to report my situation		0.5
4	Being conscious thinking about what I need to do now	1.0	
5	Checking whether I have enough time to cope with their duties while receiving guidance from senior nurses	1.0	
6	Checking to see where the interruption occurred when operations are interrupted	0.9	
7	Thinking whether the situation can be handled immediately if tasks overlap	1.0	
8	Thinking whether the information I have is enough to judge task priorities	1.0	
9	Paying attention to information about individual patient personalities to predict risk		0.7
10	Paying attention to information about the cognitive function of individual patients to predict risk	0.8	
11	Paying attention to information about individual patients’ behavioral characteristics to predict risk	0.8	
12	Paying attention to information about usual behavior patterns to predict patient behavior	0.9	
13	Paying attention to the individual patient’s general condition (vital signs, symptoms, etc.) to judge urgency	1.0	
14	Paying attention to information related to the treatment of individual patients (tests, medical treatment, medications, etc.) to judge urgency	1.0	
15	Paying attention to information about individual patients’ behavioral characteristics to judge urgency	0.9	
16	Thinking whether the receiving nurse should respond to patients based on individual patients’ self-care ability	0.8	
17	Thinking whether the receiving nurse should handle the task based on its nature	0.9	

Continued

Seeing one's self from multiple perspectives		
18	Thinking whether this is a task I have had experience with before	1.0
19	Recalling whether I have experienced a similar situation in the past	1.0
20	Thinking about similar situations I have experienced in the past, both what I was able to do and what I lacked	1.0
21	Recognizing what situations are likely to become easily rushed	1.0
22	Recognizing in what situations I am likely to make mistakes	1.0
23	Considering how knowledgeable I am to handle the task	1.0
24	Thinking about the extent to which I have mastered nursing skills related to the task	1.0
25	Thinking about whether each nursing skill can be confidently implemented by one person	1.0
26	Thinking what kind of learning is needed while working on a task	0.8
27	Taking care to avoid accidents when interrupting tasks	0.9
28	Taking care to avoid accidents when time feels imminent	0.9
29	Estimating the time it takes to prepare for and finish one task	0.9
30	Comparing the time required for each task when the workload overlaps	0.9
31	Being aware of the need to calm down and think when the workload overlaps	0.9
32	Thinking about both what I can handle on my own and what I can't	1.0
33	Recognizing the differences between my actions by comparing them with those of senior nurses	1.0
34	Recognizing the differences between own behavior and theirs by comparing own behavior with that of fellow nurses	0.7
Devising concrete strategies depending on the situation		
35	Checking whether my decisions are appropriate for the task	0.9
36	Looking at and considering all possible options to determine priorities	1.0
37	Thinking about the task that requires the highest priority	1.0
38	Being aware of priority to time-sensitive tasks when prioritizing	0.9
39	Being aware of what time I have to do it when I prioritize	0.9
40	Thinking about the needs of patients when I prioritize	0.9
41	Thinking about needs of the patient's family when prioritizing	0.7
42	Being aware of the need to cooperate with others in a team to ensure patient safety	0.7
43	Considering requests for assistance with a safe response in mind when the workload overlaps	1.0
44	Being conscious of requesting assistance for the comfort of the patient even if the task can be done by one person	0.9
45	Considering requesting assistance when the task is beyond what I can handle on my own	1.0

Continued

46	Considering requesting assistance when the workload overlaps, and I cannot perform multiple tasks simultaneously	1.0
47	Being conscious of telling senior nurses in advance that we cannot perform the task due to a lack of knowledge	1.0
48	Being conscious of telling senior nurses in advance that we cannot perform the task due to a lack of skills	1.0
49	Being conscious of telling senior nurses in advance of any duties I feel uneasy about	1.0
50	Trying to figure out if I need the help of a medical professional other than a nurse	1.0
51	Thinking about what needs to be communicated about the patient's general condition when requesting tasks	1.0
52	Trying to figure out by what time I want it done when requesting someone to do the task	1.0
53	Considering the individual patient's point of care when requesting someone to do the task	1.0
54	Seeking senior nurses' opinions and making a decision when in doubt about it	1.0
55	Organizing my thoughts in my own way and then checking with senior nurses when I am unsure of a decision	1.0
56	Consulting senior nurses when I feel it is dangerous to make decisions on my own	1.0
57	Consulting senior nurses when I have concerns about my assessment	1.0
Considering a predictable time schedule		
58	Considering a time schedule that anticipates when tasks will overlap	1.0
59	Considering a time schedule by selecting tasks that can be adjusted to accommodate time	1.0
60	Considering a time schedule by selecting tasks that are time-sensitive and time-adjustable	1.0
61	Considering a time schedule by selecting tasks that can be multitasked and executed simultaneously	1.0
62	Considering a time schedule that allows multiple tasks to be performed together	1.0
63	Considering a time schedule with efficient workflow in mind	1.0
64	Considering a time schedule that anticipates patient load	1.0
65	Considering a time schedule that anticipates the preparation needed to avoid multitasking	1.0
66	Considering a time schedule that allows room for task interruptions	1.0
67	Checking the time schedule need to be adjusted when a task is interrupted	1.0
68	Checking the time schedule need to be adjusted when priorities change due to changes in patient status	1.0
69	Checking if the time schedule need to be adjusted when the time schedule deviates from the scheduled time	1.0

Continued

Being aware of the situation surrounding one's self		
70	Knowing where the necessary supplies are located for the task	0.8
71	Trying to pay attention to the progress of the task of other nurses	1.0
72	Considering the role of the ward staff in the ward and the content of the request	1.0
73	Knowing who and what to report to among the medical staff	0.9
74	Considering who and what we might be able to request for among the ward staff when requesting tasks	1.0
75	Identifying which ward staff has more time to spare when requesting tasks	0.8
76	Identifying people among ward staff who are likely to request assistance	0.8
77	Being aware of who my task progress affects	0.8
78	Predicting what the consequences of my actions will be	0.8

6. Discussion

In Study 1, the surface and content validity of the scale were discussed through group interviews with five nursing education researchers. The initial item pool in scale development must be broader and more comprehensive than one's theoretical views of the target construct [23]. We consider that this study was able to conduct a comprehensive exploration through discussions with nursing education experts from multiple perspectives. The assessment of the scale's content validity included consultation with an expert panel [22]. In addition, the expert panel was characterized by having clinical experience with the target population, having achieved professional certification in a related area, having published papers on the topic, and having initiated research on the topic area [24]. In this study, the scope of measurement tool content was discussed for appropriateness among researchers with clinical experience as nurses or in teaching advanced beginner nurses and with a master's or doctoral degree. The item content was modified based on the consensus of experts, and we considered that this enhanced the surface and content validity of the items for measuring Advanced Beginner Nurses' Self-Monitoring While Multitasking.

In Study 2, the content validity of the scale was examined through a questionnaire survey administered to 10 nurses and nursing researchers. Content validity indices are widely used to estimate the content validity of scales and focus on the consensus regarding the relevance of items to the construct [25]. The number of experts required to calculate the I-CVI was estimated to be between five and 10 [26]. In this study, five nurses with master's degrees or higher and five researchers responded to the survey to consider both clinical and research perspectives. This study set a standard I-CVI value of 0.78 or higher, as recommended by Polit and Beck [22]. Studies using the same standard [27] have also demonstrated valid results. In addition, since all research collaborators had experience teaching advanced beginner nurses across various departments, we believe this study covered

a wide range of areas relevant to these nurses, resulting in valid results.

Regarding the five items that were not selected in Study 2, we consider that “3. Thinking of where I am and what I am doing to report my situation” in “Recognizing the situation one’s facing” was not selected because it was deemed not to fit the concept, since it is something one would think about even without being in a multitasking situation. The “9. Paying attention to information about individual patient personalities to predict risk” was not selected because there was a similar item. In “34. recognizing the differences between own behavior and theirs by comparing own behavior with that of fellow nurses” in “Seeing one’s self from multiple perspectives”, advanced beginner nurses have too much on one’s plate [15] and it is difficult for them to even look at the behavior of their peers. “41. Thinking about needs of the patient’s family when prioritizing” in “Devising concrete strategies depending on the situation” was not selected because it was not appropriate as a scale item because the situation was limited, such as when the family was visiting the patient. “42. Being aware of the need to cooperate with others in a team to ensure patient safety” was not selected, because it was judged that cooperation with the team was not consistent with the concept of self-monitoring, in which the respondents objectively recognized themselves.

In summary, the study by the expert panel and I-CVI organized the Advanced Beginner Nurses’ Self-Monitoring Scale While Multitasking as a scale with surface and content validity. In the future, it will be necessary to examine and refine the reliability and validity of this scale.

7. Limitations and Directions for Future Research

Although this study examined the surface and content validity of nursing researchers and nurses with experience teaching advanced beginner nurses, the reliability and validity of the instrument were far from sufficient. In the future, construct validity, criterion-related validity, and reliability should be examined in advanced beginner nurses to improve the scale accuracy.

8. Conclusion

The Advanced Beginner Nurses’ Self-Monitoring Scale While Multitasking was organized into 73 items through expert meetings and examination of the content validity index, resulting in a scale with surface and content validity. In the future, it will be necessary to examine the reliability and validity of the scale for advanced beginner nurses to increase their potential for use.

Conflicts of Interest

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

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