A Study on Improving Listening Efficacy of Instructions for Nursing Students Towards the Accurate Information Transfer

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Abstract
Aim: Focusing on the listening efficacy of instructions as skills for medical safety, we devised a social skills training (SST) of instructions-received skills for nursing students. For that reason, this study aims to examine the relationship between the improvement of the skills after SST and the experience of the students.
Methods: The participants were second-year nursing students in a three-year nursing program (N = 89, Mean age = 20.3, SD = 2.2). The SST intervention was performed in January 2015 after a 90-minute lecture on transmitting and taking instructions. Pre- and post-SST self-assessment instruments were applied to assess the acquisition of skills for taking directions and transmitting directions, and freely description. Date were analyzed using KH Coder (Ver.2.x 2013) developed by Higuchi (2011), in which hierarchical cluster analysis and correspondence analysis are conducted.
Results and discussion: Skills for taking directions were 44.7 ± 5.1 points with 49.1 ± 5.5 points after the SST. The text data of 1257 phrases that consist of 3218 words were extracted and analyzed. Phrases that appeared ten or more times in frequency were classified into five clusters. They were "learning towards the training", "opportunity to think about the instructions received"," anxiety to listening to the nurse", "their actions will lead to incidents", and "it is confirmed the question is important for patient safety". The effectiveness of the SST intervention is suggested for improving skills for transmitting and taking instructions. As a result, nursing students, through SST intervention, learned about the importance of accurate information transfer.

Keywords: SST, medical safety, nursing student education, communication

Introduction

The population of Japan is aging and the birthrate is declining; therefore, a variety of medical needs exist to address this concern. These medical needs are complicated as the duration of hospital stay have decreased and there is an increased risk of medical accidents. Consequently, patient safety is an important concern now more than ever.

In current nursing practice, the advancement of technology, and the limited time that nursing students have to learn said technology, create risks to patients' medical safety. In addition, younger individuals have shown reduced basic life skills, a lack of common sense, decreased academic achievement, and a lack of communication skills at the workplace (Yoshida & Matsuo, 2015). Moreover, anxiety remains a concern for the safety of the medical team.

Therefore, basic nursing education and new nursing training has been reconsidered in the nursing field. The Ministry of Health, Labour and Welfare have created "rookie nursing staff" training guidelines to strengthen and organize new nurses' education (Ministry of Health, Labour and Welfare, 2011).

In Fukuda and colleagues' report, rookie nurses were found to be subject to both long-term and short-term mental and physical stress (Fukuda-Hanaoka, 2004). It is difficult for new nurses to adjust to their new workplace after graduation. Measures to enable a smooth transition to clinical practice from basic nursing education are required. Moreover, the cultivation of communication skills for the medical care team is critical. Nurses play a key role among medical teams as they provide patient safety, use predictive power and judgment toward the patients' conditions, and require communication skills (Ministry of Health, Labour and Welfare, 2011). This study focused on education to improve new nurses' communication skills to ensure patients' medical safety.

Previous research examining nurses' communication skills noted that the accurate transmission of information is important to prevent negative incidents (Nambu et al., 2006, Masumi et al., 2008). Nambu et al. (2006) analyzed nurses' interaction data to determine the risks associated with communication errors and how closely related they were to problematic incidents. Medical task is adapted to processes temporally stretched a plurality of co-medical staff involved, nurses has implemented this concurrently and multiple other tasks. Nurses' transferring and sharing of information is closely related to the occurrence of incidents. Concurrently, it is also an important key to ensuring medical safety (Nambu et al., 2006). Masumi et al. (2008) noted that when there is no coordination with other departments there is a risk of errors, miscommunication, and missing instructions. In a study of nursing students, Yoshida et al. extracted nurses' reporting skills to clinical leaders with respect to information transmission. According to the report, at the time of graduation, nurses' reporting skills were unidirectional. However, reports have stated that there is the possibility for communication to be bidirectional. Matsuo (2011) described the tools that can be used as a guide when training a nursing student including emergency communication tools such as situation–background–assessment–recommendation (SBAR). On the other hand, Ishikawa (2010) stated that to introduce SBAR into clinical practice, it is important to ensure it is well understood by training leaders and the ward staff, that they cooperate, and that they are adequately prepared for its challenges. Therefore, we

have also focused on nurses' transmission of information and its relation to patient safety. We examined this in the context of social-skills training (SST) and extracted the skills involved in nursing students' ability to receive instructions. If reflective listening did not occur and appropriate questions were not asked we assumed a greater risk of medical accidents. Skillful reception of instructions was measured before and after the SST, using the "instruction receiving skills" extracted from previous studies. As a result, we expected scores to significantly improve after an SST intervention (Yamamoto et al., 2015).

In this study, we analyze nurses' understanding after SST implementation assuming the instructions were received appropriately. In addition, we examined how nursing students felt about the experience related to their improvement of skillful instruction reception through the SST.

Methods

Participants

The participants were second-year nursing students enrolled in a three-year nursing program (N = 120, mean age = 20.3, SD = 2.2).

Intervention date

The SST intervention was performed in class in January 2015 after a 90-minute lecture on transmitting and taking directions.

Instruments

Pre- and post-SST self-assessment instruments were applied to assess the acquisition of skills for transmitting and taking directions.

Skills for transmitting and taking directions

A scale was devised based on previous studies such as Yamamoto (2015), AHRQ (2007), Miller et al. (2008), and Riley et al. (2008). Appraisals were conducted using a five-point Likert-type scale ranging from 1 (*cannot be sure at all*) to 5 (*can be sure*) (Table 1).

Table 1. Skills for taking and transmitting directions

Skills	Definition	Behaviors example
Skills for taking directions	Checking understanding verbally	・Issue instructional content orally
	Concentrate on instruction	・Even when you are busy, stop and listen carefully
	Validity	・Consider on your own whether instructions are reasonable
	Uncertain execution	・If there are any doubts as to the instruction to stop the execution
	Forwarding to the appropriate person	・People with specific needs or questions are forwarded to the appropriate specialists
Skills for transmitting directions	Reporting confirmation	・Seek reports or notes on the item at hand
	Level adjustment	・Observe whether instructions are executed successfully, and determine the necessary support
	Confirmation and evaluation of the implementation process	・Instruction al content and explanations are devised to allow instructees to fully understand action

SST: Skills for taking directions

The class was divided into role-playing groups of three: the nurse, the nursing student, and an observer. The role-player received suggestions regarding how to receive and question/confirm their instructions from the other students and the teachers.

Statistical analysis

Skills for taking direction's point

The sum of the 5 factors of skills for taking directions was calculated using a Pearson correlation coefficient pre- and post-SST. Analysis was conducted using IBM Statistics SPSS 23 for Windows.

Free description about what was learned in the SST

Data were analyzed using KH Coder Ver.2.X 2013 developed by Higuchi (2013). Hierarchical cluster and correspondence analysis were conducted and the results were examined and classified.

Results

1. Skills for taking directions pre- and post-SST

The relationship between skills pre- and post-SST showed a significant positive correlation ($r = .422$, $p < .05$) (Figure 1).

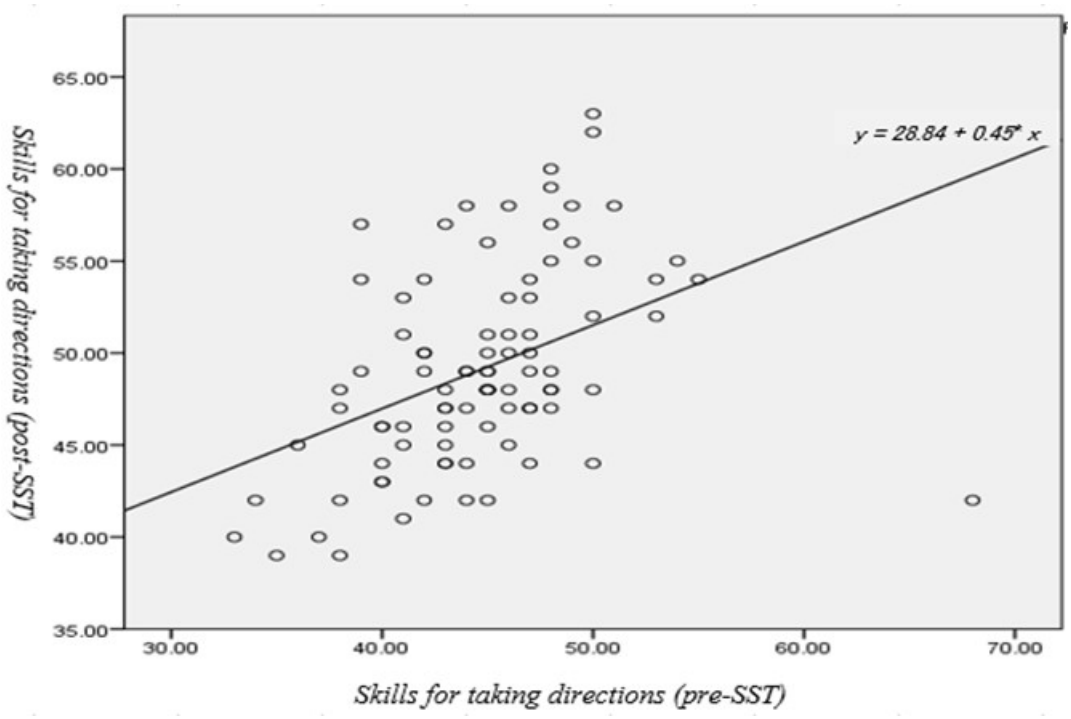

Figure 1. The correlation of skills for taking direction pre- and post-SST

The frequency of morpheme occurrence

The total number of words extracted from the written answers of 89 students was 3,218. Of these, 1,257 were extracted as the analysis target.

The learning contents of instructions received in SST

(1) Learning elements in the SST (cluster analysis)

Hierarchical cluster analysis was conducted to increase the frequency by 10 times or to extract 23 morphemes. The learning element of social skills training was extracted for taking direction skills. A hierarchical clustering dendrogram obtained through analysis (square Euclid distance, Ward's method) showed results along a distance of 150 obtained from high interpretability. In short, five clusters were extracted (Figure 2).

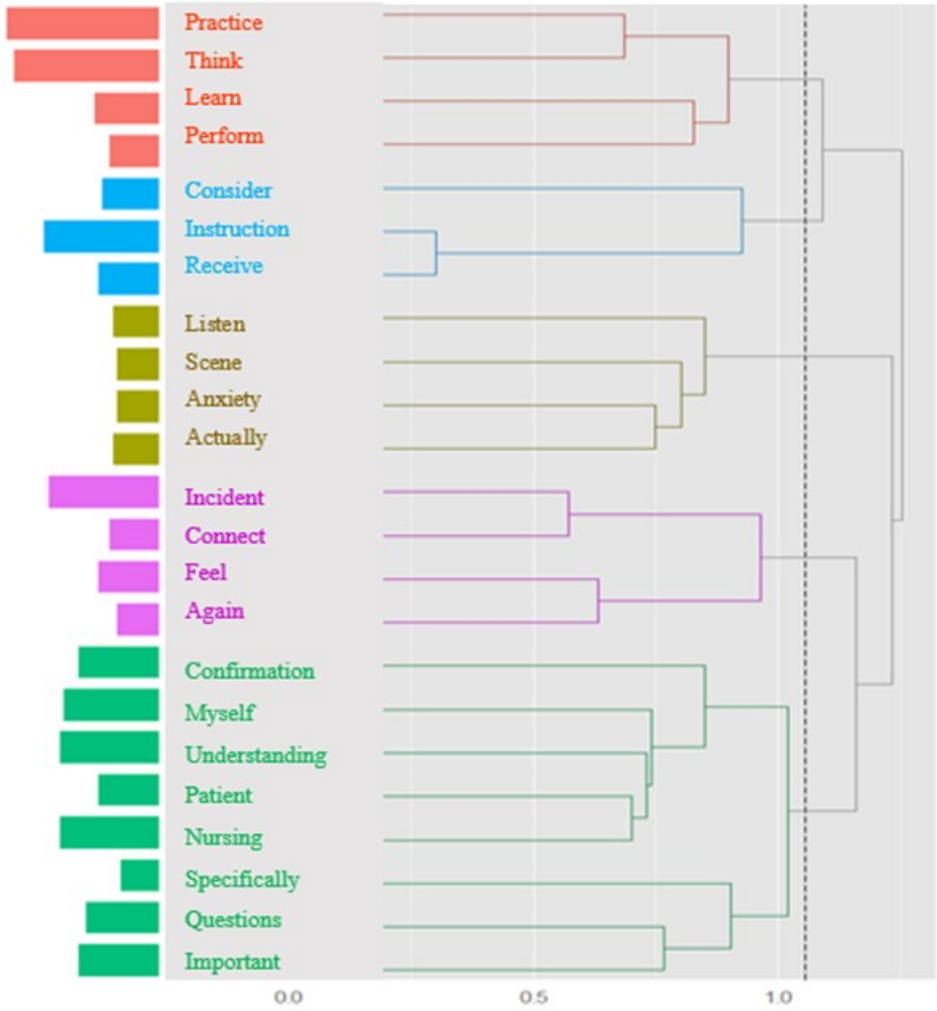

Figure 2. Cluster analysis

According to analysis results, five factors were extracted: "Learning towards training," "opportunity to think about taking directions," "actual anxiety about listening to the nurse," "feels that their actions will lead to an incident," and "the safety of the patient must be confirmed by specific questions" (Table 2).

Table 2. The learning contents of the skills for taking direction

Cluster analysis		*Learning the contents of the extracted taking direction skills*
Practice Think, Learn, Perform	*1*	*Learning towards training*
Consider , Instruction, Receive	*2*	*Opportunity to think about taking direction*
Listen, Scene, Anxiety, Actually	*3*	*Actual anxiety about listening to the nurse*
Incident, Connect, Feel, Aagain	*4*	*Feel that their actions actions will lead to the incident*
Confirmation, Myself, Understanding, Patient, Nursing, Specifically, Questions,	*5*	*It is important for the safety of the patient to be confirmed by specific questions*

(2) Changes in the scoring transition pre- and post-SST (correspondence analysis)

Pre-SST, the mean score was 44.69 (SD = 5.07). The scoring changes are shown in Table 3.

Table 3. The skills for taking direction by group

		Post-SST	
		Low	High
Pre-SST	Low	15	26
	High	5	43

(3) Characteristics of the groups' learning by change of the skills for taking direction point

The four lists after measuring frequency of the extracted morphemes groups are shown in Table 4. The value of the Jaccard coefficient indicated a value as the similarity is greater as it is closer to 1. The "Low-High change" group represented those that asked questions, recognized the importance of nursing, and understood the difficulty. The "High-Low change" group felt the need to question and learned awareness from the lack of perspective. The "High-High-maintenance" group were able to understand instructions and were able to think in connection with the incidents. Finally, the "Low-Low-maintenance" group was intended to show the importance of instructional confirmation, and had learned corresponding in response to an instruction. Characteristic phrases were extracted for each of four groups.

Table 4. Taking direction skills score change group: Another keyword

High-High (N = 43)		*High-Low (N = 5)*		*Low-High (N = 26)*		*Low-Low (N = 15)*	
Incident	.147	*Confimation*	.107	*Think*	.179	*Perform*	.133
Practice	.146	*Important*	.103	*Nursing*	.129	*Instruction*	.103
Myself	.133	*Danger*	.083	*Question*	.127	*Nursing*	.089
Instruction	.109	*Repeat*	.083	*Practice*	.123	*Learne*	.077
Understand	.103	*Daily*	.083	*Difficult*	.120	*Confirmation*	.074
Consider	.091	*Eye*	.083	*Listen*	.118	*This time*	.067
Receive	.079	*Fun*	.083	*Feel*	.107	*Receive*	.058
connected	.072	*Small*	.083	*Important*	.097	*Corresponder*	.050
Patient	.071	*Expression*	.083	*Concrete*	.096	*Surely*	.050
Behavior	.064	*Calm down*	.083	*Understand*	.095	*Ambiguous*	.050

Free description of participants who's SST score had decreased

The scores of 10 individuals decreased after the SST and the description content are presented in Table 5. Learning the importance of confirmation actions such as "I want to take advantage of training in the future" was positively received in the SST.

Table 5. Description contents of participants who's SST score had decreased

Group	Pre-SST	Post-SST	Post-SST - Pre-	Description content
Low-Low (N = 1)	44	42	-2	I have found that lurking a variety of medical accidents in the medical field. We want to protect the safety of patients in cooperation with around to eliminate the medical accident.
High-High (N = 4)	55	54	-1	No description.
	50	48	-2	I thought when I received the instructions, "I can do it". However, that alone would become uneasy. I felt would lead to an incident from there. I want to hear from this exercise, anxiety to get rid of. I want to be able to understand questions,and I want to incident prevention behaviors.
	53	52	-1	Small mistakes were found that could often lead to a larger incident
	48	47	-1	I was able to really understand because it was actually their own is likely to experience content in practice site. I was able to a little relieved.I that was found to have felt the anxiety other people.
High-Low (N = 5)	46	45	-1	We learned a lot about the dangers that can occur by not confirming instructions.
	47	44	-3	It was fun.
	45	42	-3	I learned that it was important to convey my thoughts to the other party in my own words. Future training should ensure this is implemented in day-to-day procedures.
	50	44	-6	When I speak with the nurse, content to hear did not come out immediately. I thought it was important to continue to check also small that if there is a question calmly in any case.
	68	42	-26	I was able to understand the importance of taking the repeated questions and confirmation.

Related four groups of learning features (scatter diagram)

A scatter diagram is presented in Figure 3 as a visual representation of the correspondence analysis results. Components 1 and 2 represent the contribution ratio of the components, representing 81.78% of the total data. In addition, memory axis represents the score of each component. In correspondence analysis, there is no word of the features and collection to the appearance pattern plotted near the origin (0.0). Then, as the term is away from the origin, it can be interpreted as a word characterizing the groups (Higuchi, 2013).

The X-axis can be interpreted as indicating nurses' intrapersonal thinking, understanding, and acting: "Interaction with others in the world." The Y-axis can be interpreted as the axis indicating realistic thinking and understanding introspection: "Introspective self-inspection and examination."

Describe the relationship of learning for each group below:
The High-High-group and Low-Low maintenance group were adjacent near the origin and the learning contents were close. These are not the point of the study is similar, and reflect on yourself and say either. High remains of people who are able to embody, low remains of people who had a subtle difference that often close to their own learning.

The Low-High-group and the High-Low change group were separated when viewed from the vertical axis. The Low-High group showed "realistically what is ready to move into action," as shown by the meaning of phrases "concrete, scene, hear".
The Low–High rise group, still be able to adopt the others point of view, which can be converted to a realization.

The High-Low falling group (five only), lacked incorporating others' point of view and learned to "convey the question" and "confirm importance." This was a feature not yet been acting out remains in its reflection.

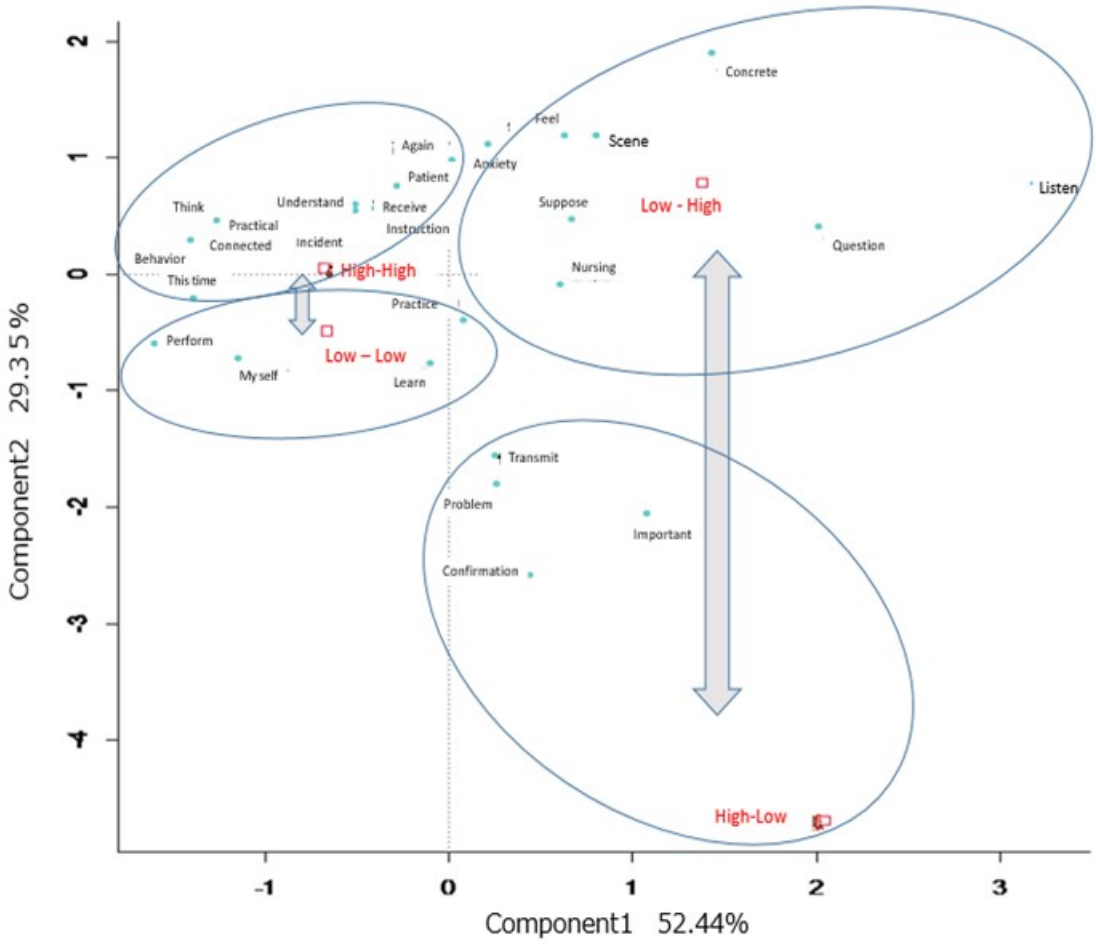

Figure 3. Correspondence analysis results by group showing the score changes in skills for taking direction

Discussion

There was a distinctive learning difference among each of the four groups. Of the score maintenance group, high - high group reconfirmed to connect with incidents and technique of instructions received skills. This advanced a specific understanding to prevent incidents. The Low–Low and High-High groups showed similar learning including self-evaluation, introspective learning features, and the importance of receiving instructions.

For the score change High-Low group, individuals were believed to have learned that it is important to confirm the question such as to recognize self-skills through self-reflection properly.

The Low-High group is believed to have led to an increase in students who did not know how to listen significantly. When interacting with others, it is a characteristic way of thinking such as understanding the specific questions and information accurately.

In summary, between the two groups, it was taking the perspective of others that brought about changes. In other words, it is critical to be aware of the exchange of instructions. "It is the interaction with others", whether to bring what kind of

consciousness there, there you can or implemented or considered measures, and the key is to learn that It is considered to be.

In addition, the group instructions received skills score was increased after the SST is a person who was considered the embodiment, it is considered to be a person who was able to image or How do I make in practice. Only aware of the risk and importance, even if possible increase in the immaturity of awareness and prudence, action as a countermeasure is also considered necessary to learn as a next step. Therefore, "skill learning to teaching the acting out" would be said that important. In particular, even if want to do, I do not know the manner of the way, even though the important, the people who, how stepping is hesitation not know, instructions received skills SST will help.

Learning stage of the instruction received skills

An analysis of the study's contents after SST learning revealed that even those who had an originally high-instructions received skill score, by looking at the behavior of others, the need for their own an opportunity to be compared with the self to take a more appropriate action lead in learning. However, as of the group to which low rises, High - Low, since you have not reached the "learning to concrete action, such as listen to questions", to students, for the skill to receive the instruction, considered student each of the learning phase is present. In other words, learning is caused due to the objective view yourself as the effect of modeling learning brings. In addition, to tell to check the question cognitive rustic learn such is important is generated.

In other words, the acquisition of the instructions received skills created a distinct learning phase: 1) build proper recognition, 2) understanding the need for action towards correct information transmission, 3) be able to organize and perform specific information transmission acquisition, and 4) execute concrete clinical actions. Yoshida et al. In order to implement two-way communication for accurate information transfer the acquisition process of reporting skills proposed by Ishikawa SBAR is important. In addition, the acquisition phase of the instructions received should be considered when developing a technical education program for the accurate information transfer to nursing students.

Towards the learning of accurate information transfer

This study examined the communication challenges related to information transmission Yoshida et al. suggested varied teaching methods to organize the educational content. Sharing ideas and to listening to questions when nursing students do not understand instructions will improve bidirectional communication. This indication received skills SST is a clinical training just before the intervention. Some those who had already acquired the skills, were also those who do not. For example, by incorporating from the first year of the acquisition of the instructions received skills as action learning systematic, it can be proposed learning of the small step.

Moreover, gradual learning might reduce student's anxiety. By fostering confidence, students' ability to understand the importance of accurate information transmission will enhance skill acquisition. This is important as the lack of confidence and knowledge of novice nurses are dangerous and can lead to medical accidents.

Incorporating a stepwise method toward implementing skills instruction could lead a more effective means of acquiring reliable instruction-receiving skills. This is required among other medical practitioners such as doctors and pharmacists to ensure accurate information transfer and safe medical care.

In this paper, we examined nursing students' ability to receive instructional skills before and after SST. However, the connections with real-world clinical practice require further analysis as students are not currently able to implement these instructions independently. For this purpose, which Ishikawa (2010) also pointed out, it is necessary to understand cooperation among clinical leaders in the healthcare field.

Conclusion

First, the analysis of the free-description text data revealed and extracted five elements to the skill of receiving instructions. Second, the skill of receiving instructions that improved for the Low–High change group was characterized by an accurate understanding of the specific questions and information. The reduced skill for the High-Low group can be improved by learning to properly recognize self-skills through self-reflection. Third, the High-High maintenance group was characterized by specific ideas, and the Low-Low group was characterized by introspective learning and the importance of receiving instructions. Aware of the "it is the interaction with others", whether to bring what kind of consciousness there, there you can or implemented or considered measures, it has become clear that the key to learn that It was.

Therefore, to acquire instructional receiving skills through SST it is important to 1) build proper recognition, 2) understand the need for action towards correct information transmission and concrete actions, 3) reduce errors in information transmission, and 4) execute concrete clinical actions. The instructions received during SST early in the first year are necessary to enhance nursing students' learning of technology and accurate information transfer.

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