

# Examination of the Validity of Attainment Goals for School Nursing Arts at Graduation from *Yogo* Teacher Education in Japan

Megumi Kagotani\*, Nobuko Endo\*\*, Hiromi Sakuma\*\*\*, Risako Saito\*\*\*\*, Yoshiko Tan\*\*\*\*, Mutsumi Matsueda\*\*\*\*\*, Yasuko Mitsumori\*\*\*\*\*, Mayumi Oshida\*\*\*\*\*, Takashi Asakura\*\*\*\*\*

\*Faculty of Health Sciences, Kyorin University  
megumi-kagotani@ks.kyorin-u.ac.jp

\*\*Department of Health and Nutrition, School of Nutrition Sciences, Kagawa Nutrition University

\*\*\*Center for Liberal Arts Education, SBC Tokyo Medical University

\*\*\*\*College of Integrated Human and Social Welfare Studies, Shukutoku University

\*\*\*\*\*Faculty of Nursing and Human Nutrition, Department of Nursing, Yamaguchi Prefectural University

\*\*\*\*\*Faculty of Education, Okayama University

\*\*\*\*\*Faculty of Education, Chiba University

\*\*\*\*\*The United Graduate School of Education, Tokyo Gakugei University

\*\*\*\*\*Department of Global Collaboration in Nursing Research, Shiga University of Medical Science

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**Background:** School nurses are expected to safeguard students' lives and promote their health. In Japan, similar responsibilities are assumed by *Yogo* teachers. Unlike school nurses in other countries, *Yogo* teachers are primarily educators, rather than medical professionals, who are not required to have nursing qualifications. They follow unique practices, applying specialized knowledge and school nursing arts to ensure students' safety and well-being, address physical and mental health issues, and promote growth and development. However, *Yogo* teachers face challenges in practicing school nursing arts, particularly first aid. Therefore, the levels of school nursing arts required for *Yogo* teachers must be defined and their acquisition of necessary skills through appropriate training must be ensured.

**Objective:** This study clarifies the attainment goals for school nursing arts at graduation from *Yogo* teacher education.

**Methods:** In 2021, a nationwide preliminary survey (Study 1) was conducted among *Yogo* teacher instructors to gather initial insights. Based on these findings, expert meetings and two rounds of modified Delphi surveys (Study 2) were conducted during 2023–2024. The revised goals, encompassing 170 items categorized into four domains, were organized into four proficiency levels: (1) Basic School Nursing Arts, (2) School Nursing Arts to Keep Safety and Comfort of Children, (3) School Nursing Arts of Daily Life Support, and (4) School Nursing Arts of Health Support.

**Results:** In Study 1, the data of 36 participants were analyzed, and 12 items had agreement rates <80%. In Study 2, expert meetings were conducted to refine items and goals. Subsequent surveys were conducted on 25 and 14 participants in the first and second rounds, respectively. The final set of 170 items achieved agreement rates ≥80% or average scores ≥3.2 (the maximum being 4) by the second round. Items with low agreement rates, such as medication-related tasks, reflected differences in practice between *Yogo* teachers and school nurses.

**Conclusions:** The importance of providing medical care in schools is increasing because, during emergencies, certain medications are now being administered by school staff. Typically, *Yogo* teachers are not expected to perform medical procedures. However, their role in schools may evolve to incorporate changes in children's health conditions and social needs in the future. This study's findings support curriculum revision and enhance *Yogo* teachers' preparedness to assume their roles. Moreover, educational content and attainment goals must be updated regularly to address future changes in children's health needs.

**Keywords:** school nursing, *Yogo* teacher, nursing art, teacher education

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## I. Introduction

Worldwide, school nurses are expected to safeguard schoolchildren's lives and promote their health. In this context, school nursing is defined as a specialized nursing practice that protects and promotes student health, facilitates optimal development, and advances academic success<sup>1)</sup>. In Japan, *Yogo* teachers serve a comparable role.

Although both school nurses and *Yogo* teachers engage in school nursing practices, they differ in their qualifications and responsibilities and the scope of care they provide. For example, in the United States, school nurses are responsible for distributing medications to students. In contrast, *Yogo* teachers in Japan typically do not perform this task, as their role is primarily educational rather than medical. This difference stems from the fact that *Yogo* teachers are positioned primarily as educators, not as licensed medical professionals, and are therefore not required to hold a nursing license.

Specially qualified *Yogo* teachers support children's growth and development by providing health education and services based on health promotion principles in all areas of school-based educational activities<sup>2)</sup>. To provide these health services, *Yogo* teachers need school nursing knowledge and skills that enable them to safeguard students' health. Accordingly, they carry out distinctive school nursing practices known as school nursing arts.

School nursing arts refer to the skills based on one's professional knowledge of school nursing to resolve students' physical and mental health issues, promote their growth and development, and ensure their safety and comfort<sup>3)</sup>. *Yogo* teachers must have such knowledge and technical skills to deliver effective school health practices.

In Japan, candidates for the first-class *Yogo* teacher license are legally required to complete 10 academic credits in nursing science. However, trainees find it challenging to acquire practical school nursing skills through existing *Yogo* teacher training programs. Previous studies indicate low levels of proficiency in school nursing arts<sup>4)</sup> and an urgent need for additional training opportunities<sup>5)</sup>. Therefore, developing these essential skills within limited instructional time remains a key issue in *Yogo* teacher education.

*Yogo* teachers are expected by both the school and the broader community to utilize school nursing arts, particularly first aid from the start of their employment<sup>6,7)</sup>. However, research reports that more than 90% of the *Yogo* teachers struggle with administering first aid<sup>8)</sup>.

Another study found that novice *Yogo* teachers and those with limited experience find it difficult to conduct accurate physical assessments for head injuries<sup>9)</sup>. According to the most recent study, *Yogo* teachers with less than 10 years of experience report a high need for further training in school nursing arts<sup>10)</sup>. Hence, *Yogo* teachers face some difficulties in practicing school nursing arts.

Currently, undergraduate education for *Yogo* teachers follows a mixed curriculum that combines nursing credential-based courses with other courses. The challenge in *Yogo* teacher education in Japan is that facilities without nursing departments have only limited time for nursing studies, which causes variations in subjects, class hours, and content across institutions. For example, differences exist in the contents of physical assessment of *Yogo* teacher education<sup>11,12)</sup> and the number of credits and days of clinical training<sup>13)</sup>. Most *Yogo* teachers, including novices, are typically assigned to a single school in Japan. Even novices must perform various professional practices using school nursing arts, such as first aid and checkups, by themselves using their limited knowledge and skills<sup>14)</sup>. Therefore, *Yogo* teachers must enhance their school nursing arts through education and training to fulfill their roles effectively.

Currently, the absence of standards for the content and attainment of school nursing arts is becoming problematic. Further, understanding of the necessity of school nursing arts for *Yogo* teachers in Japan is limited<sup>15-18)</sup>. In a recent study, the necessity of including school nursing arts in *Yogo* teacher education was represented using four levels, 4 (highly necessary for education; minimum essentials) to 1 (less necessary for education)<sup>18)</sup>. However, the level of attainment in school nursing arts at graduation remains unclear. Hence, the required level of attainment should be clarified based on expert insights and recommendations.

## II. Purpose

This study clarifies the attainment goals for school nursing arts at graduation from *Yogo* teacher education in Japan. The findings provide evidence for revising *Yogo* teacher education and enhancing curriculum quality assurance.

## III. Methods

This study followed an exploratory prospective approach, and the research process is depicted in **Figure 1**.

Based on expert consensus regarding graduation goals in *Yogo* teacher education, a preliminary questionnaire survey was conducted in 2021 (Study 1). This was followed by expert meetings and two rounds of surveys using a modified Delphi method from 2023 to 2024 (Study 2). An expert is defined as someone with knowledge and experience in a particular subject matter<sup>19</sup>).

## 1. Examination of Graduation Attainment Goals for School Nursing Arts in *Yogo* Teacher Education: A Preliminary Survey (Study 1)

### (1) Creation of a Draft of Graduation Attainment Goals: School Nursing Arts

The process was as follows: First, the researchers established four attainment levels for students at graduation, involving Level 4 (students can perform independently during *Yogo* teaching or clinical practicum), Level 3 (students can perform under supervision during *Yogo* teaching or clinical practicum), Level 2 (students can perform on-campus training with model dolls or among the students themselves), and Level 1 (students acquire it as knowledge).

Second, the researchers set each item at four levels based on the educational necessities identified by a

previous study<sup>18</sup>). Accordingly, item 4, "High necessity for education<sup>18</sup>," had to be taught at "Level 4: Students can perform independently during *Yogo* teaching or clinical practicum."

Third, school nursing arts comprised both knowledge and skill items. To enhance clarity and differentiate these categories, the researchers revised 24 of the 206 items while preserving their original meaning.

## (2) Questionnaire Survey

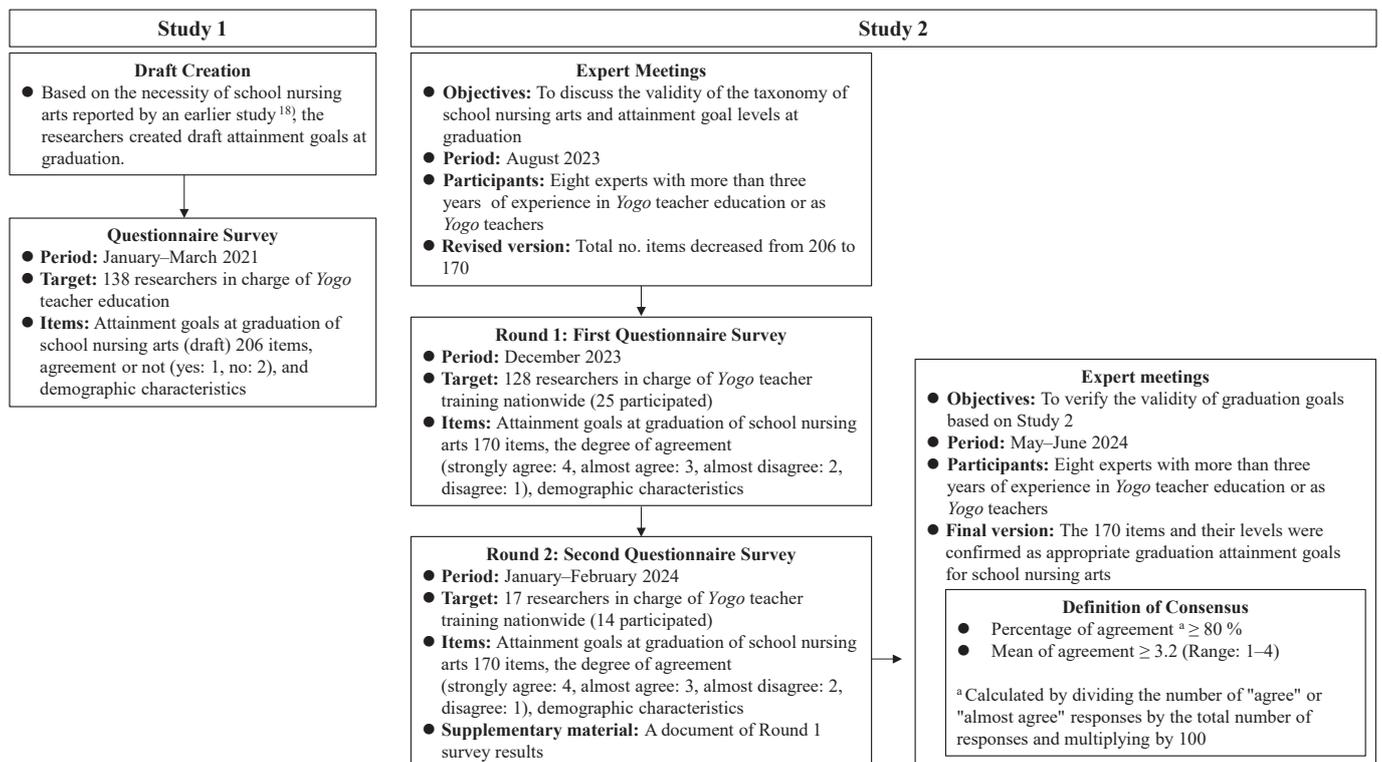
### i. Sampling and Data Collection

From January to March 2021, an anonymous questionnaire was distributed among the heads of faculties and departments of 138 *Yogo* teacher-training universities (128) and colleges (10) nationwide, and one person in charge of *Yogo* teacher education at each school was asked to respond to the survey.

### ii. Measures

In this study, the following demographic characteristics were examined: the department of the affiliated institution (education, interdisciplinary, or nursing), participant age, years of experience as a university faculty, *Yogo* teacher license, work experience as a *Yogo* teacher, school type (for respondents with *Yogo* teacher experience), and nursing license.

The agreement with the proposed graduation



**Figure 1** Overview of study 1 and study 2 processes

attainment goals for school nursing arts in *Yogo* teacher education (206 items)<sup>18)</sup> was evaluated using a two-item scale (1: Agree, 0: Disagree). Whenever a disagreement occurred, the participants indicated their perceived attainment levels and reasons as free-text comments.

## 2. Examination of Revised Graduation Attainment Goals for School Nursing Arts in *Yogo* Teacher Education Using the Modified Delphi Method (Study 2)

Study 2 evaluated the appropriateness of revised graduation attainment goals for school nursing arts. In this process, expert meetings and two questionnaire surveys were conducted using a modified Delphi method. The Delphi method is a group discussion procedure in which experts assess complex issues with uncertain and incomplete knowledge in an iterative and structured process<sup>20)</sup>. The modified Delphi method includes both Delphi rounds and a physical meeting<sup>21)</sup>. Delphi participants were polled individually, usually using self-administered questionnaires without any physical meeting, over two or more rounds. After each round, results were reported to each group<sup>21)</sup>.

### (1) Revising the Frameworks and Graduation Attainment Goals for School Nursing Arts in *Yogo* Teacher Education through Expert Meetings

In August 2023, eight experts with knowledge of and experience in *Yogo* teacher education participated in a discussion. The group included two researchers from the education department, three from the nursing department, two from an interdisciplinary department, and one with experience as a part-time *Yogo* teacher–training instructor and a *Yogo* teacher. The expert meetings aimed to revise the framework and attainment levels of school nursing arts to better reflect current educational needs.

In the 2021 survey, some items lacked clarity, causing respondents to provide varying interpretations of attainment levels. The experts examined both the overall structure and individual items, seeking to integrate similar content, eliminate redundancies, and reduce the total number of items. These efforts helped enhance the framework’s practicality and usability.

The review focused on four key areas: (i) clarification and revision of items with low agreement in the 2021 survey, (ii) differentiation of knowledge-based and skill-based competencies, (iii) identification of missing or overlapping content, and (iv) reorganization of the overall framework.

The main opinions mentioned and revisions made during expert meetings were as follows: (i) in this study, attainment refers to the minimum requirements in *Yogo* teacher education (universities where students can obtain a first-class license), which must be acquired by all students by graduation. (ii) The levels of school nursing arts attainment goals were revised as follows: Students can perform independently with minimal guidance (Level 4), students can perform under supervision (Level 3), students can simulate during on-campus training (with model dolls or among themselves) (Level 2), and students can understand it as theoretical knowledge (Level 1). (iii) Experts identified issues, such as duplicate items and missing components, prompting a review of the overall framework. Further, the revised graduation attainment goals for school nursing arts included a total of 170 items, which were categorized as follows: Basic School Nursing Arts (from 52 to 49 items), School Nursing Arts to Maintain Children’s Safety and Comfort (from 37 to 23 items), School Nursing Arts of Daily Life Support (from 52 to 38 items), and School Nursing Arts of Health Support (from 65 to 60 items).

### (2) Round 1: First Questionnaire Survey

Although there is little scientific evidence to base decisions on the optimal number of rounds, the recommended number is generally two or three<sup>21)</sup>. Since Study 2 builds on Study 1 results and expert meetings, two rounds of surveys were conducted.

#### i. Sampling and Data Collection

From November to December 2023, an anonymous questionnaire was distributed among the deans of faculties and departments of 128 *Yogo* teacher–training universities nationwide, and one person in charge of *Yogo* teachers’ training at each school was asked to respond. The questionnaires were distributed only among universities offering first-class *Yogo* teacher license, since the requirements for this license differ from those for the second-class license, affecting consensus on graduation attainment goal levels. The researchers enclosed a document outlining the differences between Study 1 and Study 2, along with the rationale for the revisions.

#### ii. Measures

Study 2 used the same items as Study 1 to investigate demographic characteristics. The agreements on the revised graduation attainment goals for school nursing arts in *Yogo* teacher education (170 items) were evaluated using a four-item scale (4: Agree, 3: Mostly Agree, 2: Somewhat Disagree, and 1: Disagree). To evaluate the consensus rate, we used a 4-point scale, considering not

only the proportion of agreement but also the mean value. Whenever a disagreement occurred, participants readily provided their reasons (as free-text comments).

### **(3) Round 2: Second Questionnaire Survey**

#### **i. Sampling and Data Collection**

From January to February 2024, an anonymous questionnaire and appropriate feedback, including qualitative comments and a summary of Round 1 survey results (the number (*n*), percentage (%), means, and standard deviations of each consensus on school nursing art and free-text comments) were sent to 17 consenting panelists for Round 2 survey. Feedback was recommended to include divergent views, such as qualitative comments and statistical measures<sup>22</sup>. Hence, feedback summarizing Round 1 statistical results and open-ended responses was distributed along with the Round 2 survey questionnaire.

#### **ii. Measures**

Similar to Round 1, demographic characteristics and revised graduation attainment goals for school nursing arts in *Yogo* teacher education (170 items) were investigated for Round 2, as well.

### **(4) Validation of Graduation Attainment Goals for School Nursing Arts in *Yogo* Teacher Education: Expert Meetings**

From May to June 2024, expert meetings with eight reviewers of Study 2 survey items were held to verify graduation goals' validity based on Study 2 results. Conducting a panel meeting toward the conclusion of the Delphi procedure may be useful when researchers find it difficult to reach consensus<sup>21</sup>. Among Round 2 survey results, some items scored more than 3.2 on average but had agreement rates less than 80%. Hence, the expert meetings reviewed all items, particularly those with agreement rates below 80%. Their validity was assessed based on whether they fell within the scope of *Yogo* teachers' duties and whether they represented appropriate attainment levels.

### **3. Analysis**

Data were analyzed using IBM SPSS Statistics (version 26.0; IBM Corp., Armonk, NY, USA). Participants with significant inconsistencies in their survey responses, such as missing values in more than half of the total items, were excluded from the analysis.

Categorical variables were presented as numbers (*n*) and percentages. Further, age and years of experience

were calculated as means and standard deviations.

In Study 1 and Study 2, the consensus rate was set at  $\geq 80\%$ <sup>23)24)</sup>. In general, the higher the cutoff scores, the stronger the consensus<sup>25)</sup>. As indicated by earlier studies<sup>18)</sup>, the evaluation of Study 2 items was based on a mean score of 3.2 or higher, or 80% participant agreement. The incorporation of both metrics facilitates detailed and precise assessment, enabling the reconsideration of items that may demonstrate a high average score, despite not reaching the agreement threshold, thereby supporting careful decision-making. The percentage of agreement in Study 2 was calculated by dividing the number of "agree" or "almost agree" responses by the total number of responses and multiplying by 100.

### **4. Ethical Considerations**

The study was conducted after obtaining permission from the Research Ethics Committee of Tokai University School of Medicine. A document explaining the study's purpose was sent to department heads, who then distributed it to the person in charge of *Yogo* teacher training. Study 2 required the return of consent forms following the dean's approval of the survey's implementation.

Further, the participants were informed of the study's purpose, the voluntary nature of participation, data use, privacy protection, and result publication method. Finally, all the participants provided informed consent by returning the questionnaire.

## **IV. Results**

### **1. Results of Graduation Attainment Goals for School Nursing Arts in *Yogo* Teacher Education (Study 1)**

#### **(1) Demographic Characteristics**

In Study 1, the number of participants was 36, with 3 providing incomplete data. These data were excluded from the analysis. Further, 48.5% of the participants were in education or interdisciplinary courses, 48.5% were in nursing, and 3.0% did not respond. Finally, 27 participants (81.8%) had a *Yogo* teacher license and 29 (87.9%) held a nursing license.

#### **(2) Degree of Consensus**

Among the 52 items in Basic School Nursing Arts, the following 7 had agreement rates below 80%: Communication Structure and Process (Level 1), Verbal

Communication (Level 1), Nonverbal Communication (Level 1), Health Assessment Process (Level 1), Measurement and Interpretation of Arterial Oxygen Saturation (SpO<sub>2</sub>) Using Pulse Oximetry (Level 3), Somatometry (Abdominal Circumference) (Level 2), and Types of Information and Methods of Information Collection (Level 1).

Among the 37 items in School Nursing Arts to Keep Safety and Comfort of Children, the following 3 had agreement rates below 80%: Basic Knowledge of Infection Establishment and Prevention (Level 1), Disinfection or Sterilization of Machinery and Instruments (Autoclaving) (Level 3), and Handling of Forceps and Forceps Stands (Level 2). Further, among the 52 items in School Nursing Arts of Daily Life Support, the following 2 had agreement rates below 80%: Basic Knowledge and Basis for Environmental Adjustment in Schools and Health Rooms (Level 1) and Changing Sheets (Level 2). Finally, the School Nursing Arts of Health Support had no items with agreement rates below 80%.

## 2. Revised Graduation Attainment Goals for School Nursing Arts in *Yogo* Teacher Education (Study 2)

### (1) Participants' Demographic Characteristics

**Table 1** summarizes participants' demographic characteristics in Rounds 1 and 2 of the survey. The number of participants in the first round was 25, among which 44.0% were in education or interdisciplinary courses and 56.0% were in nursing. Further, 22 participants (88.0%) held a *Yogo* teacher license and 22 others (88.0%) had a nursing license.

The number of participants in the second round was 14, among whom 57.1% and 42.9% were in interdisciplinary education and nursing, respectively. Further, 12 participants (85.7%) had a *Yogo* teacher license and 12 other participants (85.7%) a nursing license.

### (2) Degree of Consensus

**Table 2** depicts the results for the degree of agreement (mean scores and agreement rates) in Basic School Nursing Arts. No item had a mean score below 3.2. However, two items had agreement rates less than 80%: Percussion and Auscultation (Including Listening for Breath Sounds, Heart Sounds, and Bowel Peristalsis).

**Table 1** Demographic characteristics of the participants of Rounds 1 and 2 (Study 2)

	Round 1 (N=25)		Round 2 (N=14)	
	n	%	n	%
<b>Department of the Affiliated Institution</b>				
Education or Interdisciplinary Course	11	44.0	8	57.1
Nursing Course	14	56.0	6	42.9
<b>Age (Year)</b>				
Mean (Standard Deviation), Range	57.72 (7.35), 43–69		57.79 (6.68), 43–66	
<b>Years of Experience as a University Faculty</b>				
Mean (Standard Deviation), Range	11.96 (7.04), 2–25		12.93 (7.11), 2–26	
<b><i>Yogo</i> Teacher License</b>				
Yes	22	88.0	12	85.7
No	3	12.0	2	14.3
<b>Work Experience as a <i>Yogo</i> Teacher (Year)</b>				
Yes	18	72.0	10	71.4
No	4	16.0	2	14.3
No Answer	3	12.0	2	14.3
Mean (Standard Deviation), Range	20.17 (13.33), 2–39		21.70 (11.03), 5–38	
<b>School or Educational Institution (Experienced), Multiple Answers</b>				
Kindergarten	1		1	
Elementary School	9		6	
Junior High School	12		9	
High School	11		6	
Special-Needs School	0		0	
Board of Education	2		1	
<b>Nursing License</b>				
Yes	22	88.0	12	85.7
No	3	12.0	2	14.3

**Table 2** Degree of consensus on the items constituting basic school nursing arts

	Knowledge (*) or Skill (**)	Attainment Goals (1-4)	Degree of Consensus (Round 1)						Degree of Consensus (Round 2)						
			<i>n</i>	Mean	SD	Range (Min.-Max.)	%	<i>n</i>	Mean	SD	Range (Min.-Max.)	%			
<b>I-1 Communication Skills</b>															
<b>I-1-1 Communication</b>															
1	Communication Structure and Process	**	4	24	3.75	0.44	3	4	100.0	14	3.86	0.36	3	4	100.0
2	Verbal Communication	**	4	24	3.88	0.34	3	4	100.0	14	3.93	0.27	3	4	100.0
3	Nonverbal Communication	**	4	24	3.79	0.42	3	4	100.0	14	3.93	0.27	3	4	100.0
4	Interviewing Techniques	**	4	24	3.71	0.46	3	4	100.0	14	3.86	0.36	3	4	100.0
<b>I-2 Health Assessment Skills</b>															
<b>I-2-1 Fundamentals of Health Assessment</b>															
5	Concept of Health Assessment in Schools	*	1	25	3.72	0.61	2	4	92.0	14	3.79	0.80	1	4	92.9
6	Health Assessment Process	**	4	25	3.80	0.50	2	4	96.0	14	3.93	0.27	3	4	100.0
7	Interview	**	4	25	3.92	0.28	3	4	100.0	14	3.86	0.36	3	4	100.0
8	Inspection	**	4	25	3.88	0.33	3	4	100.0	14	3.86	0.36	3	4	100.0
9	Percussion	**	3	25	3.44	0.96	1	4	84.0	14	3.21	0.98	1	4	78.6
10	Palpation	**	4	25	3.68	0.56	2	4	96.0	14	3.79	0.58	2	4	92.9
11	Auscultation (Including Listening for Breath Sounds, Heart Sounds, and Bowel Peristalsis)	**	3	25	3.60	0.50	3	4	100.0	14	3.36	0.84	2	4	78.6
<b>I-2-2 Systematic Health Assessment</b>															
12	Observation and Interpretation of Vital Signs (Level of Consciousness)	**	4	25	3.84	0.47	2	4	96.0	14	3.86	0.36	3	4	100.0
13	Observation and Interpretation of Vital Signs (Respiration)	**	4	25	3.84	0.47	2	4	96.0	14	3.86	0.36	3	4	100.0
14	Observation and Interpretation of Vital Signs (Pulse)	**	4	25	3.88	0.33	3	4	100.0	14	3.93	0.27	3	4	100.0
15	Observation and Interpretation of Vital Signs (Blood Pressure)	**	4	25	3.68	0.56	2	4	96.0	14	3.64	0.63	2	4	92.9
16	Observation and Interpretation of Vital Signs (Body Temperature)	**	4	25	3.88	0.33	3	4	100.0	14	4.00	0.00	4	4	100.0
17	Systematic Health Assessment	**	4	25	3.68	0.63	2	4	92.0	14	3.79	0.43	3	4	100.0
18	Assessment of Morphological Growth and Functional Development	**	4	25	3.76	0.52	2	4	96.0	14	3.79	0.43	3	4	100.0
19	Assessment of Physical Growth	**	4	25	3.84	0.37	3	4	100.0	14	4.00	0.00	4	4	100.0
20	Assessment of Psychological and Social Development	**	4	25	3.76	0.44	3	4	100.0	14	3.79	0.43	3	4	100.0
21	Assessment of Lifestyle	**	4	25	3.88	0.33	3	4	100.0	14	4.00	0.00	4	4	100.0
22	Assessment of Nurturing Environment	**	4	25	3.64	0.49	3	4	100.0	14	3.79	0.43	3	4	100.0
<b>I-2-3 Physical Checkup</b>															
23	Somatometry (Height)	**	4	25	4.00	0.00	4	4	100.0	14	3.79	0.80	1	4	92.9
24	Somatometry (Weight)	**	4	25	4.00	0.00	4	4	100.0	14	3.79	0.80	1	4	92.9
25	Somatometry (Abdominal Circumference)	**	2	25	3.48	0.87	1	4	92.0	14	3.43	1.09	1	4	85.7
26	Somatometry (Chest Circumference)	**	2	25	3.36	1.00	1	4	88.0	14	3.36	1.08	1	4	85.7
27	Visual Acuity	**	4	25	3.88	0.60	1	4	96.0	14	3.71	0.83	1	4	92.9
28	Hearing Test	**	4	25	3.88	0.60	1	4	96.0	14	3.71	0.83	1	4	92.9
<b>I-3 Health Examination Support Skills</b>															
<b>I-3-1 Support for Various Medical Checkups</b>															
29	Support for Various Medical Examinations (Internal Medicine, Otolaryngology, Ophthalmology, Dentistry, etc.)	**	4	25	3.68	0.75	1	4	92.0	14	3.79	0.80	1	4	92.9
30	Support in Various Examinations (Urinalysis, Electrocardiogram, Chest X-Ray, etc.)	**	4	25	3.64	0.76	1	4	92.0	14	3.64	0.84	1	4	92.9
<b>I-4 Skills to Develop the <i>Yogo</i> Teacher Activity Process</b>															
<b>I-4-1 Developing the Process of <i>Yogo</i> Teacher Activities (Understanding the Actual Situation, Planning, Implementation, and Evaluation)</b>															
31	Process of <i>Yogo</i> Practice and <i>Yogo</i> Diagnosis	**	4	24	3.63	0.77	1	4	91.7	14	3.57	0.76	2	4	85.7
32	Collection of Information	**	4	24	3.71	0.55	2	4	95.8	14	3.79	0.58	2	4	92.9
33	Integration and Analysis of Information	**	4	24	3.67	0.57	2	4	95.8	14	3.79	0.58	2	4	92.9
34	Clarification and Prioritization of Problems	**	4	24	3.71	0.55	2	4	95.8	14	3.79	0.58	2	4	92.9
35	Goal Setting and Planning	**	4	24	3.67	0.57	2	4	95.8	14	3.79	0.58	2	4	92.9
36	<i>Yogo</i> Practice and Evaluation	**	4	24	3.67	0.57	2	4	95.8	14	3.71	0.61	2	4	92.9

	Knowledge (*) or Skill (**)	Attainment Goals (1-4)	Degree of Consensus (Round 1)						Degree of Consensus (Round 2)						
			n	Mean	SD	Range (Min.–Max.)		%	n	Mean	SD	Range (Min.–Max.)		%	
<b>I-4-2 Information Management</b>															
37	Recording, Reporting, and Sharing Information	**	4	24	3.79	0.42	3	4	100.0	14	3.93	0.27	3	4	100.0
38	Information Management	**	4	23	3.78	0.42	3	4	100.0	14	3.93	0.27	3	4	100.0
<b>I-5 Skills for Supporting Self-Care</b>															
<b>I-5-1 Supporting Self-Care</b>															
39	Theories Related to Self-Care	*	1	25	3.68	0.63	2	4	92.0	14	3.86	0.36	3	4	100.0
40	Basic Knowledge of Children's Self-Care Development and Support Methods	*	1	25	3.68	0.63	2	4	92.0	14	3.86	0.36	3	4	100.0
41	Characteristics of Individual and Group Guidance	*	1	25	3.88	0.33	3	4	100.0	14	3.86	0.36	3	4	100.0
42	Goal Setting Tailored to the Subject	**	4	25	3.72	0.54	2	4	96.0	14	3.86	0.36	3	4	100.0
43	Support Tailored to the Subject	**	4	25	3.64	0.57	2	4	96.0	14	3.86	0.36	3	4	100.0
<b>I-6 Skills for Supporting Health Maintenance and Promotion</b>															
<b>I-6-1 Supporting Health Maintenance and Promotion</b>															
44	Support for Life According to the Growth and Development of Young Children	**	4	25	3.68	0.56	2	4	96.0	14	3.86	0.36	3	4	100.0
45	Support for Life According to the Growth and Development of School-Age Children	**	4	25	3.84	0.47	2	4	96.0	14	3.93	0.27	3	4	100.0
46	Support for Life According to Growth and Development in Adolescence	**	4	25	3.84	0.47	2	4	96.0	14	3.93	0.27	3	4	100.0
<b>I-7 Mental Support Skills</b>															
<b>I-7-1 Mental Support</b>															
47	Assessment of Conditions Requiring Mental Health Care	**	4	25	3.80	0.50	2	4	96.0	14	3.93	0.27	3	4	100.0
48	Methods of Mental Health Care (Assistance Planning)	**	4	25	3.76	0.52	2	4	96.0	14	3.93	0.27	3	4	100.0
49	Mental Healthcare Methods (Specific Problem-Solving Assistance)	**	4	25	3.68	0.56	2	4	96.0	14	3.93	0.27	3	4	100.0

**Tables 3 and 4** depict the agreement results for School Nursing Arts to Keep Safety and Comfort of Children and School Nursing Arts of Daily Life Support. None of the items had either a mean score below 3.2 and an agreement rate below 80%.

**Table 5** presents agreement results for School Nursing Arts of Health Support. Although no item had a mean score below 3.2, the following eight items had agreement rates below 80%: Medication Assistance (Oral Medication), Medication Assistance (Inhalation), Medication Assistance (Poultice), Medication Assistance (Eye Drops), Medication Assistance (Gargling), Medication Assistance (Self-Monitoring of Blood Glucose, Self-Injection), Responding to Asphyxiation (Including Back Blow Method and Abdominal Thrust), and Moist Wound Healing.

Although not all items reached an agreement rate of 80% or higher, the mean scores of all items were 3.2 or above, ensuring the criteria were met. Finally, eight experts reviewed Study 2 results, including scores and free comments, and confirmed that all levels were appropriate graduation attainment goals for school nursing arts.

## V. Discussion

This study clarified the attainment goals for school nursing arts at graduation for *Yogo* teacher education in Japan. A key strength of this study is that it involved a thorough review and revision of the original taxonomy of school nursing arts and attainment levels integrating earlier research<sup>3)18)</sup>, a 2021 survey, expert discussions, and two nationwide surveys on *Yogo* teacher trainers. Consequently, the study established proficiency levels for 170 school nursing arts required at graduation.

### 1. Validity of *Yogo* Teachers' Attainment Goals for School Nursing Arts at Graduation

In this study, revised the attainment goals for school nursing arts at graduation for *Yogo* teacher education were proposed based on multiple surveys and expert discussions, ensuring a high validity of the results. However, the consensus rate for some items was below 80%, for example, physical assessment skills, particularly Percussion and Auscultation (Including Listening for Breath Sounds, Heart Sounds, and Bowel Peristalsis).

**Table 3** Degree of consensus on the items constituting school nursing arts to keep safety and comfort of children

	Knowledge (*) or Skill (**)	Attainment Goals (1-4)	Degree of Consensus (Round 1)						Degree of Consensus (Round 2)						
			<i>n</i>	Mean	SD	Range (Min.-Max.)	%	<i>n</i>	Mean	SD	Range (Min.-Max.)	%			
<b>II-1 Safety and Comfort Skills in School Nursing</b>															
<b>II-1-1 Safety and Comfort Basics</b>															
1	Concept of Safety and Safety Management in School Nursing	*	1	25	3.60	0.82	1	4	88.0	14	3.86	0.36	3	4	100.0
2	Concept of Safety and Comfort	*	1	25	3.52	0.77	1	4	92.0	14	3.93	0.27	3	4	100.0
3	Principles of Body Mechanics and Their Application to Safe and Comfortable School Nursing Practice	**	4	25	3.72	0.46	3	4	100.0	14	3.79	0.43	3	4	100.0
<b>II-2 Infection Prevention Skills</b>															
<b>II-2-1 Infection Prevention Measures</b>															
4	Basic Knowledge of Infection Establishment and Prevention	*	1	25	3.60	0.91	1	4	88.0	14	3.71	0.83	1	4	92.9
5	Adherence to Standard Precautions (Including Wearing Disposable Gloves, Masks, and Aprons)	**	4	25	3.92	0.28	3	4	100.0	14	3.86	0.36	3	4	100.0
6	Hygienic Hand Washing (Including the Rubbing Method)	**	4	25	3.92	0.28	3	4	100.0	14	3.93	0.27	3	4	100.0
7	Proper Disposal of Vomit, Blood, Feces, and Other Bodily Fluids	**	4	25	3.88	0.33	3	4	100.0	14	4.00	0.00	4	4	100.0
<b>II-2-2 Appropriate Selection and Implementation of Cleaning, Disinfection, and Sterilization Methods</b>															
8	Types, Effects, Preparation, and Cleaning Methods of Disinfectants	*	1	25	3.80	0.41	3	4	100.0	14	3.86	0.54	2	4	92.9
9	Chemical Disinfection of Machines and Instruments	**	4	25	3.72	0.54	2	4	96.0	14	3.86	0.36	3	4	100.0
10	High-Pressure Steam Sterilization of Machines and Instruments	**	4	25	3.56	0.71	2	4	88.0	14	3.79	0.58	2	4	92.9
11	Boiling Disinfection of Machines and Instruments	**	4	25	3.56	0.71	2	4	88.0	14	3.93	0.27	3	4	100.0
<b>II-2-3 Aseptic Technique</b>															
12	Handling of Forceps and Forceps Stands	**	4	25	3.72	0.54	2	4	96.0	14	3.86	0.36	3	4	100.0
13	Handling of Disinfectant Cotton Balls and Jars	**	2	25	3.48	0.82	1	4	88.0	14	3.86	0.36	3	4	100.0
14	Handling of Sterilized Materials	**	3	25	3.60	0.76	1	4	92.0	14	3.86	0.36	3	4	100.0
<b>II-3 Skills for Relieving Pain and Ensuring Comfort</b>															
<b>II-3-1 Provision of Comfort</b>															
15	Assisting with Comfortable Postures and Positions According to Symptoms and Conditions	**	4	25	3.84	0.47	2	4	96.0	14	3.86	0.36	3	4	100.0
16	Comfort Care (Including Touching and Relaxation)	**	4	25	3.72	0.54	2	4	96.0	14	3.86	0.36	3	4	100.0
17	Adjustment of the Infirmary Environment to Maintain Comfort	**	4	25	3.88	0.33	3	4	100.0	14	3.86	0.36	3	4	100.0
<b>II-3-2 Body Temperature Control</b>															
18	Methods for Thermoregulation (Including Basic Knowledge of Compresses)	*	1	25	3.80	0.65	1	4	96.0	14	3.79	0.43	3	4	100.0
19	Assessment of Body Temperature Control	**	4	25	3.92	0.28	3	4	100.0	14	3.86	0.36	3	4	100.0
20	Warm Compresses	**	4	25	3.92	0.28	3	4	100.0	14	3.86	0.36	3	4	100.0
21	Ice Pillow	**	4	25	3.68	0.75	1	4	92.0	14	3.71	0.83	1	4	92.9
22	Ice Pack	**	3	25	3.36	0.95	1	4	84.0	14	3.79	0.80	1	4	92.9
23	Ice Neck	**	3	25	3.44	0.92	1	4	88.0	14	3.79	0.80	1	4	92.9

Percussion requires practice to make sounds, whereas auscultation requires training to distinguish normal and abnormal sounds, both requiring time to perfect. Therefore, respondents' thoughts regarding the techniques and levels to be taught may differ. In particular, for percussion, previous research<sup>(11)</sup> reveals that the level of education regarding chest and abdominal percussions

differs between nursing training and other educational institutions. Hence, due to differences in opinion, the agreement rate likely fell below 80%. In addition, these results probably reflect the limited situations in which *Yogo* teachers perform percussion or auscultation in practice<sup>(26)(27)</sup>. Hence, further research is required to clarify the educational content, including percussion and

**Table 4** Degree of consensus on the items constituting school nursing arts of daily life support

	Knowledge (*) or Skill (**)	Attainment Goals (1-4)	Degree of Consensus (Round 1)						Degree of Consensus (Round 2)						
			n	Mean	SD	Range (Min.-Max.)		%	n	Mean	SD	Range (Min.-Max.)		%	
<b>III-1 Environmental Adjustment Skills</b>															
<b>III-1-1 Environmental Coordination</b>															
1	Rationale for Health Room Environment Adjustment	*	1	25	3.84	0.62	1	4	96.0	14	3.79	0.80	1	4	92.9
2	Assessment and Environmental Adjustment of School and Health Room Environments	**	4	25	3.84	0.37	3	4	100.0	14	3.93	0.27	3	4	100.0
3	Overall School Environmental Health Management	**	4	25	3.84	0.37	3	4	100.0	14	3.93	0.27	3	4	100.0
4	Environmental Adjustment of Temperature, Humidity, Ventilation, Lighting, Odor, and Noise and Health Room Maintenance	**	4	25	3.84	0.37	3	4	100.0	14	3.93	0.27	3	4	100.0
<b>III-1-2 Management of Supplies, Hygiene Materials, and Related Items</b>															
5	Management of Health Room Equipment, Supplies, and Related Items	**	4	25	3.92	0.28	3	4	100.0	14	4.00	0.00	4	4	100.0
6	Management of Hygiene Materials and Medication	**	4	25	3.88	0.33	3	4	100.0	14	4.00	0.00	4	4	100.0
<b>III-1-3 Bed Making</b>															
7	Selection and Devising of Bedding	**	4	25	3.72	0.68	1	4	96.0	14	3.93	0.27	3	4	100.0
8	Bedding Handling	**	4	25	3.68	0.69	1	4	96.0	14	4.00	0.00	4	4	100.0
9	Bed Making and Sheet Changing	**	4	25	3.88	0.33	3	4	100.0	14	3.86	0.36	3	4	100.0
<b>III-2 Basic Daily Living Assistance Skills</b>															
<b>III-2-1 Assistance with Diet and Nutrition (Basic Skills)</b>															
10	Diet and Nutrition Assessment	**	4	25	3.76	0.44	3	4	100.0	14	3.93	0.27	3	4	100.0
11	Assistance with Diet and Eating Habits	**	4	25	3.64	0.70	1	4	96.0	14	3.79	0.80	1	4	92.9
<b>III-2-2 Assistance with Elimination (Basic Skills)</b>															
12	Basic Knowledge of Children's Level of Independence and Toileting Assistance Methods	*	1	25	3.56	0.77	1	4	92.0	14	3.64	0.63	2	4	92.9
13	Basic Knowledge of Toileting Assistance and Portable Toileting	*	1	25	3.64	0.57	2	4	96.0	14	3.57	0.65	2	4	92.9
14	Assessment of Elimination	**	4	25	3.72	0.46	3	4	100.0	14	3.79	0.43	3	4	100.0
<b>III-2-3 Assistance with Hygiene and Clothing</b>															
15	Assessment of Cleanliness and Clothing	**	4	25	3.88	0.33	3	4	100.0	14	3.93	0.27	3	4	100.0
16	Cleanliness Support and Assistance	**	4	25	3.68	0.69	1	4	96.0	14	3.71	0.83	1	4	92.9
17	Clothing Cleanliness and Support for Dressing and Undressing	**	3	25	3.48	0.92	1	4	88.0	14	3.50	0.94	1	4	85.7
<b>III-3 Skills Related to Medical Care</b>															
<b>III-3-1 Medical Care in Special Needs Education</b>															
18	Basic Knowledge of Special Support Education	*	1	25	3.68	0.75	1	4	92.0	14	3.93	0.27	3	4	100.0
19	Understanding Medical Care	*	1	25	3.88	0.44	2	4	96.0	14	3.71	0.61	2	4	92.9
20	Scope of Medical Care	*	1	25	3.84	0.47	2	4	96.0	14	3.93	0.27	3	4	100.0
<b>III-3-2 Assistance with Diet and Nutrition (When special care is needed)</b>															
21	Assistance for Children with Feeding Difficulties	**	3	25	3.32	1.07	1	4	80.0	14	3.50	0.94	1	4	85.7
22	Assistance for Children with Swallowing Difficulties	**	2	25	3.28	1.14	1	4	80.0	14	3.50	0.94	1	4	85.7
23	Tube and Enteral Feeding	**	2	25	3.44	0.96	1	4	84.0	14	3.36	0.93	1	4	85.7
<b>III-3-3 Assistance with Elimination (When Special Care Is Required)</b>															
24	Self-Catheterization	**	1	25	3.32	0.99	1	4	80.0	14	3.57	0.85	1	4	92.9
25	Support and Assistance with Urination and Defecation	**	2	25	3.28	0.98	1	4	80.0	14	3.43	0.94	1	4	85.7
<b>III-4 Assistive Technology for Activity and Rest</b>															
<b>III-4-1 Basics of Activity and Exercise</b>															
26	Assessment of Activity and Exercise	**	4	25	3.76	0.44	3	4	100.0	14	3.86	0.36	3	4	100.0
<b>III-4-2 Positioning and Repositioning</b>															
27	Basic Knowledge of Positioning and Repositioning	*	1	25	3.56	0.92	1	4	88.0	14	3.86	0.36	3	4	100.0
28	Assistive Techniques for Repositioning	**	3	25	3.44	0.77	1	4	92.0	14	3.71	0.61	2	4	92.9

	Knowledge (*) or Skill (**)	Attainment Goals (1-4)	Degree of Consensus (Round 1)						Degree of Consensus (Round 2)					
			<i>n</i>	Mean	SD	Range (Min.-Max.)		%	<i>n</i>	Mean	SD	Range (Min.-Max.)		%
29 Utilization of Body Mechanics	**	4	25	3.72	0.46	3	4	100.0	14	3.86	0.36	3	4	100.0
<b>III-4-3 Moving and Transferring</b>														
30 Walking Assistance	**	3	25	3.60	0.71	1	4	96.0	14	3.64	0.63	2	4	92.9
31 Walking Using Crutches	**	3	25	3.52	0.71	1	4	96.0	14	3.71	0.61	2	4	92.9
32 Wheelchair Transfer	**	4	25	3.56	0.71	1	4	96.0	14	3.93	0.27	3	4	100.0
33 Stretcher Transfer	**	2	25	3.40	0.96	1	4	84.0	14	3.50	0.94	1	4	85.7
34 Manual Transfer	**	2	25	3.48	0.87	1	4	92.0	14	3.57	0.76	2	4	85.7
35 Litter Transport	**	4	25	3.40	0.91	1	4	88.0	14	3.71	0.73	2	4	85.7
<b>III-4-4 Assistance with Rest and Sleep</b>														
36 Basic Knowledge of Rest and Sleep	*	1	25	3.64	0.81	1	4	88.0	14	4.00	0.00	4	4	100.0
37 Assessment of Rest and Sleep	**	4	25	3.80	0.41	3	4	100.0	14	3.93	0.27	3	4	100.0
38 Assistance to Promote Rest and Sleep	**	4	25	3.56	0.77	1	4	92.0	14	3.71	0.83	1	4	92.9

**Table 5** Degree of consensus on the items constituting school nursing arts of health support

	Knowledge (*) or Skill (**)	Attainment Goals (1-4)	Degree of Consensus (Round 1)						Degree of Consensus (Round 2)					
			<i>n</i>	Mean	SD	Range (Min.-Max.)		%	<i>n</i>	Mean	SD	Range (Min.-Max.)		%
<b>IV-1 Medication Skills</b>														
<b>IV-1-1 Medication Assistance</b>														
1 Basic Knowledge of Medication Therapy	*	1	25	3.56	0.77	1	4	92.0	14	3.86	0.54	2	4	92.9
2 Medication Assistance (Oral Medication)	**	3	25	3.32	0.99	1	4	80.0	14	3.36	1.01	1	4	78.6
3 Medication Assistance (Inhalation)	**	3	25	3.24	1.09	1	4	76.0	14	3.36	1.01	1	4	78.6
4 Medication Assistance (Oral Cavity)	**	2	25	3.24	1.09	1	4	76.0	14	3.57	0.94	1	4	85.7
5 Medication Assistance (Suppository)	**	2	25	3.36	1.00	1	4	80.0	14	3.57	0.94	1	4	85.7
6 Medication Assistance (Coating)	**	3	25	3.40	0.96	1	4	84.0	14	3.43	0.94	1	4	85.7
7 Medication Assistance (Patch)	**	3	25	3.40	0.96	1	4	84.0	14	3.43	0.94	1	4	85.7
8 Medication Assistance (Poultice)	**	3	25	3.40	0.96	1	4	84.0	14	3.36	1.01	1	4	78.6
9 Medication Assistance (Eye Drops)	**	3	25	3.40	0.96	1	4	84.0	14	3.21	1.05	1	4	71.4
10 Medication Assistance (Ear Drops)	**	2	25	3.48	0.92	1	4	88.0	14	3.43	0.94	1	4	85.7
11 Medication Assistance (Nasal Drops)	**	2	25	3.44	0.92	1	4	88.0	14	3.43	0.94	1	4	85.7
12 Medication Assistance (Gargling)	**	3	24	3.46	0.88	1	4	91.7	14	3.36	1.01	1	4	78.6
13 Medication Assistance (Atomization)	**	2	25	3.48	0.92	1	4	88.0	14	3.43	0.94	1	4	85.7
14 Medication Assistance (Self-Monitoring of Blood Glucose, Self-Injection)	**	3	24	3.17	1.09	1	4	75.0	14	3.36	1.01	1	4	78.6
<b>IV-2 Respiratory and Circulatory Control Techniques</b>														
<b>IV-2-1 Respiratory Care</b>														
15 Respiratory Assessment (Including SpO <sub>2</sub> Measurement)	**	4	25	3.76	0.52	2	4	96.0	14	3.86	0.36	3	4	100.0
16 Oxygen Therapy	**	2	24	3.42	0.93	1	4	87.5	14	3.50	0.94	1	4	85.7
17 Nebulizer	**	2	24	3.42	0.93	1	4	87.5	14	3.57	0.94	1	4	85.7
18 Postures and Breathing Practices to Ease Breathing	**	4	24	3.67	0.57	2	4	95.8	14	3.57	0.76	2	4	85.7
19 Indications and Methods of Bronchial Drainage	**	3	24	3.46	0.83	1	4	87.5	14	3.43	0.94	1	4	85.7
20 Oral and Nasal Suctioning (up to the Pharynx)	**	2	24	3.38	0.92	1	4	87.5	14	3.57	0.76	2	4	85.7
21 Suctioning Through Tracheal Cannula	**	1	24	3.33	0.92	1	4	87.5	14	3.50	0.94	1	4	85.7
<b>IV-2-2 Circulation Care</b>														
22 Assessment of Circulation	**	4	25	3.56	0.77	1	4	92.0	14	3.79	0.58	2	4	92.9
23 Postures and Positions to Maintain Blood Pressure and Blood Flow	**	4	25	3.60	0.71	1	4	96.0	14	3.86	0.54	2	4	92.9
<b>IV-3 Basic Life Support Skills</b>														
<b>IV-3-1 Basic Life Support</b>														
24 Assessment of Life-Threatening Situations	**	4	25	3.72	0.61	2	4	92.0	14	3.93	0.27	3	4	100.0
25 Triage	**	4	25	3.52	0.59	2	4	96.0	14	3.71	0.47	3	4	100.0
26 Airway Maintenance	**	4	25	3.80	0.50	2	4	96.0	14	4.00	0.00	4	4	100.0
27 Artificial Respiration	**	4	25	3.80	0.50	2	4	96.0	14	4.00	0.00	4	4	100.0
28 Chest Compression	**	4	25	3.80	0.50	2	4	96.0	14	4.00	0.00	4	4	100.0
29 Automated External Defibrillator (AED)	**	4	25	3.84	0.47	2	4	96.0	14	4.00	0.00	4	4	100.0
30 Body Temperature Management	**	4	25	3.80	0.58	2	4	92.0	14	4.00	0.00	4	4	100.0

	Knowledge (*) or Skill (**)	Attainment Goals (1-4)	Degree of Consensus (Round 1)						Degree of Consensus (Round 2)					
			n	Mean	SD	Range (Min.–Max.)		%	n	Mean	SD	Range (Min.–Max.)		%
31 Hemostasis	**	4	25	3.84	0.47	2	4	96.0	14	4.00	0.00	4	4	100.0
32 EpiPen® Injection	**	4	25	3.88	0.44	2	4	96.0	14	3.93	0.27	3	4	100.0
33 Responding to Asphyxiation (Including Back Blow Method and Abdominal Thrust)	**	4	25	3.60	0.71	2	4	88.0	14	3.64	0.75	2	4	78.6
<b>IV-4 Symptom-Specific School Nursing Skills</b>														
<b>IV-4-1 Support for Acutely and Chronically Ill Children</b>														
34 Basic Knowledge of Acute Illnesses	*	1	25	3.68	0.75	1	4	92.0	14	3.93	0.27	3	4	100.0
35 Assessment of and Response to Acute Illnesses	**	4	25	3.68	0.56	2	4	96.0	14	3.86	0.36	3	4	100.0
36 Understanding and Supporting Children with Chronic Disease	**	4	24	3.63	0.58	2	4	95.8	14	3.86	0.36	3	4	100.0
<b>IV-5 Wound Care Skills</b>														
<b>IV-5-1 Skin and Wound Management</b>														
37 Basic Knowledge of Wound Care and Management	*	1	25	3.72	0.61	2	4	92.0	14	4.00	0.00	4	4	100.0
38 Wound-Healing Process	*	1	25	3.72	0.61	2	4	92.0	14	4.00	0.00	4	4	100.0
39 Prevention of Bedsores and Promotion of Healing	*	1	24	3.67	0.64	2	4	91.7	14	3.93	0.27	3	4	100.0
40 Wound Assessment	**	4	25	3.84	0.37	3	4	100.0	14	3.93	0.27	3	4	100.0
41 Moist Wound Healing	**	4	24	3.37	0.97	1	4	83.3	14	3.36	0.84	2	4	78.6
42 Rest, Ice, Compression, and Elevation Methods (RICE)	**	4	25	3.84	0.47	2	4	96.0	14	4.00	0.00	4	4	100.0
43 Fracture Immobilization (Forearm, Upper Arm, Clavicle, Finger, Lower Leg, etc.)	**	4	25	3.80	0.50	2	4	96.0	14	3.79	0.58	2	4	92.9
44 Wound Cleaning and Protection	**	4	25	3.76	0.52	2	4	96.0	14	3.93	0.27	3	4	100.0
<b>IV-5-2 Bandaging</b>														
45 Basic Knowledge of Bandaging Methods	*	1	25	3.60	0.91	1	4	88.0	14	3.86	0.54	2	4	92.9
46 Types and Characteristics of Bandages (Roller Bandage)	**	4	25	3.64	0.76	1	4	92.0	14	3.64	0.84	1	4	92.9
47 Types and Characteristics of Bandages (Triangular Bandage)	**	4	25	3.72	0.68	1	4	96.0	14	3.64	0.84	1	4	92.9
48 Types and Characteristics of Bandages (Elastic Bandages)	**	4	25	3.72	0.68	1	4	96.0	14	3.64	0.84	1	4	92.9
49 Types and Characteristics of Bandages (Tube and Net Bandages)	**	4	25	3.68	0.69	1	4	96.0	14	3.64	0.84	1	4	92.9
50 Types and Characteristics of Bandages (Splints)	**	4	25	3.68	0.69	1	4	96.0	14	3.64	0.84	1	4	92.9
51 Use of Bandages According to the Site and Type of Injury (Circular Bandage)	**	4	25	3.72	0.46	3	4	100.0	14	3.64	0.84	1	4	92.9
52 Use of Bandages According to the Site and Type of Injury (Serpentine Bandage)	**	4	25	3.60	0.58	2	4	96.0	14	3.64	0.84	1	4	92.9
53 Use of Bandages According to the Site and Type of Injury (Folded Bandage)	**	4	25	3.36	0.76	2	4	84.0	14	3.64	0.84	1	4	92.9
54 Use of Bandages According to the Site and Type of Injury (Spica Bandage)	**	4	25	3.48	0.65	2	4	92.0	14	3.64	0.84	1	4	92.9
55 Use of Bandages According to the Site and Type of Injury (Centripetal Bandage)	**	4	25	3.44	0.65	2	4	92.0	14	3.64	0.84	1	4	92.9
56 Use of Bandages According to the Site and Type of Injury (Dissecting Tortoiseshell Bandage)	**	4	25	3.44	0.65	2	4	92.0	14	3.64	0.84	1	4	92.9
57 Use of Bandages According to the Site and Type of Injury (Repetitive Finger Bandage)	**	4	25	3.56	0.58	2	4	96.0	14	3.64	0.84	1	4	92.9
58 Use of Bandages According to the Site and Type of Injury (Insufficiency Finger Bandage)	**	4	25	3.44	0.77	1	4	92.0	14	3.57	0.85	1	4	92.9
59 Use of Triangular Bandages According to the Site and Type of Injury	**	4	25	3.80	0.41	3	4	100.0	14	3.71	0.83	1	4	92.9
60 Use of Splint Bandage	**	4	24	3.67	0.48	3	4	100.0	14	3.64	0.84	1	4	92.9

auscultation, necessary for *Yogo* teacher practices.

Another concern is medication assistance. The following six items at Level 3 had agreement rates less than 80%: Medication Assistance (Oral Medication),

Medication Assistance (Inhalation), Medication Assistance (Poultice), Medication Assistance (Eye Drops), Medication Assistance (Gargling), and Medication Assistance (Self-Monitoring of Blood

Glucose, Self-Injection). These aspects are typically handled by school nurses and rarely by *Yogo* teachers. In contrast, due to the increased need for medical care in schools, school staff are now permitted to administer some medications, such as EpiPen® Injection, BUCCOLAM®, and Baqsimi® (Glucagon), to save children's lives under certain conditions and during emergencies<sup>28</sup>. Furthermore, a study<sup>29</sup> reports that more than 80% of *Yogo* teachers have experience in managing medical pharmaceuticals. However, they are uncertain and find it difficult to make accurate judgments and to discontinue medicine use during emergencies, owing to their limited emergency response experience and the case-specific nature of each situation. Hence, this aspect may require revision in the future as their roles evolve.

Similar to Japan, the United States is facing an increase in chronic conditions among children and records the highest medication use over the past 30 years, highlighting the importance of medication management in schools<sup>30</sup>. Although the situation in Japan and the roles of *Yogo* teachers and school nurses differ from U.S. conditions, the United States has policies in place to manage medication administration errors, including measures to prevent future errors. Additionally, they routinely prepare and use guidelines for children's illnesses<sup>31</sup>. Although we cannot directly apply the practices followed in other countries, we should focus on protecting children's lives, promoting their health, improving *Yogo* teacher education, and considering evidence from school nursing practices to develop essential competencies.

Another item with an agreement rate less than 80% is Responding to Asphyxiation (Back Blow and Abdominal Thrust), which is a critical skill that may be difficult to teach at Level 4 due to its complexity. Hence, further discussion on whether Level 4 proficiency is suitable in teacher training is warranted. Similarly, Moist Wound Healing is important in wound healing. However, *Yogo* teachers focus on first aid and, hence, must consider infection risks and other factors. Accordingly, a discussion on whether to set Moist Wound Healing at Level 4 is necessary.

## 2. Limitations and Strengths

The main limitation of this study was its low response rate. Due to challenges in the recruitment process, the survey might not have reached all target participants. Hence, the study's findings may not represent a consensus among all those involved in *Yogo* teacher

education. Further, earlier studies indicate that panel composition influences rating<sup>21)32</sup>. However, another study suggests a heterogeneous decision-making group may ensure better performance than a homogeneous one<sup>33</sup>. This study included participants from various training institutions, reflecting the status of *Yogo* teacher education. Furthermore, there is no standard size for panel members (typically, 10–100)<sup>19</sup>, with a three-digit sample size being unusual due to the possible occurrence of data management and logistical issues (e.g., survey rounds). Since children's health needs change over time, the content of school nursing arts and attainment levels at graduation require regular revision.

To obtain more generalizable results, future researchers should consider purposive sampling. This sampling should reflect not only the diversity of academic departments but also the subjects taught by, professional qualifications of, and years of practical experience of participants. In addition, group interviews may be useful in collecting more in-depth perspectives. Furthermore, for items with an agreement rate below 80%, careful wording revision must be performed to explicitly clarify the relevant school nursing competencies.

This study has several strengths. It built on earlier research and included Studies 1 and 2, both of which contributed to evidence accumulation. Additionally, it involved the refinement and consolidation of 206 items into 170 items. The separation of knowledge and skills and clear articulation of graduation attainment levels are the study's key strengths. This study provides evidence for *Yogo* teacher trainers and schools to revise and improve curricula to ensure the *Yogo* teachers' preparedness to assume their roles.

Many nursing-based training institutions substitute the nursing science courses required for *Yogo* teacher licensure with those originally designed for nursing students. This practice presents a challenge, because such curricula may neither sufficiently encompass the specific school nursing arts required in school settings nor adequately address the school nursing practices requiring astute judgment and decision-making. Therefore, the current findings can contribute to curriculum reviews aimed at ensuring adequate preparation in school-specific nursing competencies.

In addition, some *Yogo* teachers in Japan hold nursing qualifications, which may cause variability in attainment levels at graduation. Whereas this study focused on identifying the minimum required attainment levels, future research should investigate level differences across training institutions. Moreover, universities

based in education or interdisciplinary fields often face time constraints in the inclusion of nursing content, necessitating the prioritization of core competencies based on the attainment levels identified in this study.

## VI. Conclusions

This study clarified the attainment goals for school nursing arts at graduation for *Yogo* teacher education in Japan. The findings provide evidence for revising the content of *Yogo* teacher education and enhancing curriculum quality assurance. Furthermore, as children's health needs change over time, the content of school nursing arts and the corresponding attainment levels at graduation will require regular revision.

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### Conflict of interests

The authors declare no conflicts of interest.

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**Name:**

Megumi Kagotani

**Affiliation:**

Faculty of Health Sciences, Kyorin University

**Address:**

5-4-1 Shimorenjaku, Mitaka-shi, Tokyo 181-8612 Japan

**Brief Biography:**

- 2024-Associate Professor, Faculty of Health Sciences, Kyorin University
- 2022-Associate Professor, Faculty of Medicine, Tokai University
- 2014-Lecturer, Faculty of Health Sciences, Tokai University

**Main Works:**

- Kagotani, M., & Asakura, T.: Path Model of Reality Gap on the Mental Health of Novice School Nurses in Japan. *SAGE Open Nursing* 10, 2024  
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**Membership in Learned Societies:**

- Japanese Association of School Health
- Japan Academy of Nursing Science
- Japanese Association of Yogo Teacher Education

## Appendix 1 学校看護技術の卒業時の到達度

到達度：4：少しの助言で単独で実施できる
3：指導の下で実施できる
2：学内演習（モデル人形，あるいは学生間）で模擬的に実施できる
1：知識として理解できる

I 基本技術		到達度	
<b>I-1 コミュニケーション技術</b>			
<b>I-1-1 コミュニケーション</b>			
1	技術	コミュニケーションの構造とプロセス	4
2	技術	言語的コミュニケーション	4
3	技術	非言語的コミュニケーション	4
4	技術	面接技法	4
<b>I-2 ヘルスアセスメント技術</b>			
<b>I-2-1 ヘルスアセスメントの基本</b>			
5	知識	学校におけるヘルスアセスメントの考え方	1
6	技術	ヘルスアセスメントのプロセス	4
7	技術	問診	4
8	技術	視診	4
9	技術	打診	3
10	技術	触診	4
11	技術	聴診（呼吸音，心音，腸蠕動音聴取を含む）	3
<b>I-2-2 系統的アセスメント</b>			
12	技術	バイタルサイン（意識レベル）の観察と解釈	4
13	技術	バイタルサイン（呼吸）の観察と解釈	4
14	技術	バイタルサイン（脈拍）の観察と解釈	4
15	技術	バイタルサイン（血圧）の観察と解釈	4
16	技術	バイタルサイン（体温）の観察と解釈	4
17	技術	系統的アセスメント	4
18	技術	形態的成長と機能的発達の評価	4
19	技術	身体発育の評価	4
20	技術	心理・社会的発達の評価	4
21	技術	生活習慣の評価	4
22	技術	養育環境の評価	4
<b>I-2 ヘルスアセスメント技術</b>			
<b>I-2-3 身体測定</b>			
23	技術	身体測定（身長）	4
24	技術	身体測定（体重）	4
25	技術	身体測定（腹囲）	2
26	技術	身体測定（胸囲）	2
27	技術	視力測定	4
28	技術	聴力測定	4
<b>I-3 健康診断支援技術</b>			
<b>I-3-1 各種検診における支援</b>			
29	技術	各種検診（内科，耳鼻科，眼科，歯科等）における支援	4
30	技術	各種検査（尿検査，心電図検査，胸部エックス線検査等）における支援	4
<b>I-4 養護教諭の活動過程の展開技術</b>			
<b>I-4-1 養護教諭の活動過程（実態の把握・計画・実施・評価）の展開</b>			
31	技術	養護実践のプロセスと養護診断	4
32	技術	情報の収集	4
33	技術	情報の分析・解釈の統合	4

34	技術	問題の明確化と優先順位決定	4
35	技術	目標の設定と計画	4
36	技術	養護実践と評価	4
<b>I-4-2 情報管理</b>			
37	技術	情報の記録・報告と共有	4
38	技術	情報管理	4
<b>I-5 セルフケア 支援技術</b>			
<b>I-5-1 セルフケア支援</b>			
39	知識	セルフケアにかかわる諸理論	1
40	知識	子どものセルフケアの発達と支援方法の基本的知識	1
41	知識	個別指導・集団指導の特性	1
42	技術	対象者に合わせた目標設定	4
43	技術	対象者に合わせた支援	4
<b>I-6 健康の保持増進支援技術</b>			
<b>I-6-1 健康の保持増進支援</b>			
44	技術	幼児期の成長・発達に応じた生活への支援	4
45	技術	学童期の成長・発達に応じた生活への支援	4
46	技術	思春期の成長・発達に応じた生活への支援	4
<b>I-7 精神的援助技術</b>			
<b>I-7-1 心のケア</b>			
47	技術	心のケアが必要な状態とアセスメント	4
48	技術	心のケアの方法（援助計画）	4
49	技術	心のケアの方法（課題解決のための具体的な援助）	4
<b>II 安全・安楽を守る技術</b>			到達度
<b>II-1 学校看護における安全・安楽技術</b>			
<b>II-1-1 安全・安楽の基本</b>			
1	知識	学校看護における安全の概念と安全管理	1
2	知識	安楽の概念	1
3	技術	ボディメカニクスの原理と安全・安楽な養護実践への活用	4
<b>II-2 感染予防技術</b>			
<b>II-2-1 感染防止対策</b>			
4	知識	感染の成立と予防の基本的知識	1
5	技術	標準予防策（スタンダードプリコーション）の実施（使い捨て手袋, マスク, エプロンの着用を含む）	4
6	技術	衛生的手洗い（ラビング法を含む）	4
7	技術	吐物・血液・排泄物等の適切な処理	4
<b>II-2-2 洗浄・消毒・滅菌の適切な選択と実施方法</b>			
8	知識	消毒薬の種類・効果・作り方と洗浄方法	1
9	技術	機械・器具の薬剤消毒	4
10	技術	機械・器具の高圧蒸気滅菌	4
11	技術	機械・器具の煮沸消毒	4
<b>II-2-3 無菌操作</b>			
12	技術	鑷子と鑷子立ての取り扱い	4
13	技術	消毒綿球と万能壺の取り扱い	2
14	技術	滅菌物の取り扱い	3
<b>II-3 苦痛の緩和・安楽確保の技術</b>			
<b>II-3-1 安楽の提供</b>			
15	技術	症状・状態による安楽な姿勢・体位の援助	4
16	技術	安楽を提供するためのケア（タッチング, リラクゼーションなど）	4
17	技術	安楽を保つための保健室環境の調整	4

<b>II-3-2 体温調整</b>			
18	知識	体温調整のための方法（罨法の基本的知識を含む）	1
19	技術	体温調整のアセスメント	4
20	技術	温罨法	4
21	技術	氷枕	4
22	技術	氷嚢	3
23	技術	氷頸	3
<b>III 日常生活援助技術</b>			到達度
<b>III-1 環境調整技術</b>			
<b>III-1-1 環境の調整</b>			
1	知識	保健室の環境整備の根拠	1
2	技術	学校・保健室環境のアセスメントと環境調整	4
3	技術	学校全体の環境衛生管理	4
4	技術	温度,湿度,換気,採光,臭気,騒音,保健室整備等の環境調整	4
<b>III-1-2 備品,衛生材料等の管理</b>			
5	技術	保健室の備品等の管理	4
6	技術	衛生材料及び薬品の管理	4
<b>III-1-3 ベッドメイキング</b>			
7	技術	寝具の選択と工夫	4
8	技術	寝具の取り扱い	4
9	技術	ベッドメイキングとシーツ交換	4
<b>III-2 日常生活援助基本技術</b>			
<b>III-2-1 食事と栄養の援助（基本技術）</b>			
10	技術	食事と栄養のアセスメント	4
11	技術	食生活・食習慣の援助	4
<b>III-2-2 排泄の援助（基本技術）</b>			
12	知識	子どもの自立度と排泄の援助方法の基本的知識	1
13	知識	トイレ歩行・ポータブルトイレでの排泄の援助方法の基本的知識	1
14	技術	排泄のアセスメント	4
<b>III-2-3 清潔と衣生活の援助</b>			
15	技術	清潔と衣生活のアセスメント	4
16	技術	清潔の支援・援助	4
17	技術	衣服の清潔と着脱支援	3
<b>III-3 医療的ケア関連技術</b>			
<b>III-3-1 特別支援教育における医療的ケア</b>			
18	知識	特別支援教育の基本的知識	1
19	知識	医療的ケアとは	1
20	知識	医行為の範囲	1
<b>III-3-2 食事と栄養の援助（特別な配慮を要する場合）</b>			
21	技術	食事摂取の自立困難な子どもへの援助	3
22	技術	嚥下障害のある子どもへの援助	2
23	技術	経管・経腸栄養法	2
<b>III-3-3 排泄の援助（特別な配慮を要する場合）</b>			
24	技術	自己導尿	1
25	技術	排尿・排便に対する支援・援助	2
<b>III-4 活動・休息援助技術</b>			
<b>III-4-1 活動と運動の基本</b>			
26	技術	活動と運動のアセスメント	4

<b>III-4-2 体位・体位変換</b>			
27	知識	体位・体位変換の基本的知識	1
28	技術	体位変換の援助技術	3
29	技術	ボディメカニクスの活用	4
<b>III-4-3 移動・移送</b>			
30	技術	歩行介助	3
31	技術	松葉杖歩行	3
32	技術	車椅子への移乗・移送	4
33	技術	ストレッチャーへの移乗・移送	2
34	技術	徒手搬送法	2
35	技術	担架による搬送	4
<b>III-4-4 休息と睡眠の援助</b>			
36	知識	休息と睡眠の基本的知識	1
37	技術	休息と睡眠のアセスメント	4
38	技術	休息と睡眠を促す援助	4
<b>IV 健康支援技術</b>			到達度
<b>IV-1 与薬の技術</b>			
<b>IV-1-1 与薬の援助</b>			
1	知識	薬物療法の基本的知識	1
2	技術	与薬の援助（内服）	3
3	技術	与薬の援助（吸入）	3
4	技術	与薬の援助（口腔内）	2
5	技術	与薬の援助（座薬）	2
6	技術	与薬の援助（塗付）	3
7	技術	与薬の援助（貼付）	3
8	技術	与薬の援助（湿布）	3
9	技術	与薬の援助（点眼）	3
10	技術	与薬の援助（点耳）	2
11	技術	与薬の援助（点鼻）	2
12	技術	与薬の援助（うがい（含嗽））	3
13	技術	与薬の援助（噴霧）	2
14	技術	与薬の援助（自己測定・自己注射）	3
<b>IV-2 呼吸・循環を整える技術</b>			
<b>IV-2-1 呼吸管理</b>			
15	技術	呼吸のアセスメント（SpO <sub>2</sub> 測定を含む）	4
16	技術	酸素療法	2
17	技術	ネブライザー	2
18	技術	呼吸を楽にする姿勢と呼吸法の実践	4
19	技術	排痰法の適応と方法	3
20	技術	口腔内・鼻腔内吸引（咽頭より手前まで）	2
21	技術	気管カニューレ内吸引	1
<b>IV-2-2 循環管理</b>			
22	技術	循環のアセスメント	4
23	技術	血圧・血流を保持する姿勢や体位	4
<b>IV-3 救命救急処置技術</b>			
<b>IV-3-1 救命救急処置</b>			
24	技術	生命の危機的状況のアセスメント	4
25	技術	トリアージ	4
26	技術	気道確保	4
27	技術	人工呼吸	4

28	技術	胸骨圧迫	4
29	技術	自動体外式除細動器 (AED)	4
30	技術	体温管理	4
31	技術	止血法	4
32	技術	エピペン注射	4
33	技術	窒息時の対応 (背部叩打法・腹部突き上げ法)	4
<b>IV-4 症状別看護的技術</b>			
<b>IV-4-1 急性・慢性疾患の子どもへの支援</b>			
34	知識	急性的な経過をたどる疾患の基本的知識	1
35	技術	急性的な経過をたどる疾患のアセスメントと対応	4
36	技術	慢性 (期) の疾患の子どもの理解と支援	4
<b>IV-5 創傷管理技術</b>			
<b>IV-5-1 皮膚・創傷の管理</b>			
37	知識	創傷の処置・管理の基本的知識	1
38	知識	創傷の治癒過程	1
39	知識	褥瘡の予防と治癒の促進	1
40	技術	創傷のアセスメント	4
41	技術	湿潤療法	4
42	技術	RICE 処置	4
43	技術	骨折の固定 (前腕, 上腕, 鎖骨, 指, 下腿等の処置)	4
44	技術	創傷の洗浄, 保護	4
<b>IV-5-2 包帯法</b>			
45	知識	包帯法の基本的知識	1
46	技術	包帯の種類と特徴 (巻軸帯)	4
47	技術	包帯の種類と特徴 (三角巾)	4
48	技術	包帯の種類と特徴 (弾性包帯, 伸縮包帯)	4
49	技術	包帯の種類と特徴 (チューブ包帯 (筒状包帯, ネット包帯))	4
50	技術	包帯の種類と特徴 (副子包帯)	4
51	技術	受傷部位・種類に応じた包帯の使用法 (環行帯)	4
52	技術	受傷部位・種類に応じた包帯の使用法 (蛇行帯)	4
53	技術	受傷部位・種類に応じた包帯の使用法 (折転帯)	4
54	技術	受傷部位・種類に応じた包帯の使用法 (麦穂帯)	4
55	技術	受傷部位・種類に応じた包帯の使用法 (集合 (求心) 亀甲帯)	4
56	技術	受傷部位・種類に応じた包帯の使用法 (離解 (遠心) 亀甲帯)	4
57	技術	受傷部位・種類に応じた包帯の使用法 (反復 (指ほうか) 帯)	4
58	技術	受傷部位・種類に応じた包帯の使用法 (不全指帯)	4
59	技術	受傷部位・種類に応じた三角巾の使用法	4
60	技術	副子包帯	4