

## Five Reasons for the Lack of Nursing Students' Motivation to Learn Public Health

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Prevention is better than cure. Public health plays an important role in promoting prevent medicine. To obtain the abilities to provide appropriate nursing services, learning public health is necessary for students who want to become registered nurses. When teachers teach public health to nursing students, it is important to motivate them to learn it. Therefore, we investigated the reasons for the lack of motivation to learn public health by conducting a questionnaire survey. The subjects were female nursing students in 29 vocational schools in Kanagawa and Chiba prefectures of Japan that allow graduation after a 3-year study period. We asked the students whether or not they had completed the subject of public health and analyzed those students who answered affirmatively. We analyzed 1,553 respondents whose average age was  $22.6 \pm 5.2$  years (range, 18 to 45). Using factor analysis, we discovered the 5 reasons that lead to the lack of nursing students' motivation to learn public health: "Difficulties acquiring knowledge of public health," "Inappropriate attitudes of public health teachers," "Thinking lightly about the national examination in the field of public health," "Lack of understanding the importance of learning public health," and "Future plans that do not specialize in public health." Using multiple linear regression analysis, these 5 reasons were significant predictors for the lack of students' motivation. Older students also had significantly less motivation to learn public health than did younger students. When teachers instruct their students, they should teach public health better with the present knowledge.

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### Introduction

Public health is a subject that can help prevent diseases and promote health through organized efforts (Shimizu and Sato 2009; Detels et al. 2009a,b,c). Public health plays extremely important roles for enhancing preventive medicine. Public health includes a broad range of subfields, e.g., epidemiology, health statistics, lifestyle-related diseases, infectious diseases, food sanitation, mental health, occupational health, environmental health, and health care delivery systems. To comprehend these subfields, it is necessary to learn not only about natural sciences but also social sciences, e.g., health-related laws and societal knowledge.

Prevention is better than cure. Especially, in Japan, lifestyle-related diseases are the major causes of death

(Health, Labor and Welfare Statistics Association 2012a; Ministry of Health, Labour and Welfare 2013). Therefore, for students who want to become registered nurses, it is very important that they learn public health to provide appropriate nursing services.

It is very important to research how teachers can improve students' motivation to learn public health. However, to the best of our knowledge, in spite of the fact that public health is an important subject, there are no such studies in the literature. The predictive factors for the lack of nursing students' motivation to learn public health are necessary information for relevant teachers. In the present study, we investigated the reasons that might cause a lack of nursing students' motivation to learn public health. We, then, examined the associations between these items and

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the students' motivation to learn public health.

## Subjects and Methods

### *Subjects and methods of the questionnaire distribution and collection*

In Japan, as the most common way to become a registered nurse, a nursing student studies at an accredited educational institute for three or more years after graduating from senior high school (Health, Labor and Welfare Statistics Association 2012b). The subjects in this study were students in the vocational schools that can allow graduation after a 3-year study period. According to our interviews with teachers in nursing schools, almost all nursing students in Japan are female. Therefore, this study excluded male students. Students who had taken a temporary leave of absence from school were excluded in the subjects.

This study was carried out in Chiba and Kanagawa prefectures of Japan. There were 19 vocational schools that allow graduation after a 3-year study period in Kanagawa and 18 in Chiba. There were 16 schools that participated in the present study from Kanagawa and 14 schools from Chiba. However, because the person in charge of the study in one school in Chiba mistakenly distributed questionnaires to both the male and female students, we excluded all the students in that school from the subjects. Therefore, the subjects in this study were 5,108 female students from 16 schools in Kanagawa and 13 schools in Chiba.

During the period of June to September 2012, anonymous self-administered questionnaires, with return envelopes and Japanese explanatory literature of the present study, were distributed to 5,108 nursing students. The Japanese explanations of the study were given, e.g., clarification of the concept of voluntary cooperation in the study, and the statement of privacy protection. Approximately 1 week after the distribution, the questionnaires were collected in the sealed envelopes that were provided to ensure obtaining truthful answers. The participants could either place the questionnaires in the collection boxes or hand them directly to the persons in charge. The Ethics Committee of Kitasato University approved this study without having to undergo an ethical review proceeding.

In our former study (Kudo et al. 2013), we reported nursing students' sense of ethics and learning motivation. Because the subjects of the present study were the same as in the former study, we only described the outline of the subjects in this study. For more detail, please see our former study (Kudo et al. 2013).

### *The questionnaire contents*

The outline of the questionnaire made up various parts as described in detail in our former study (Kudo et al. 2013). Among those, because we only focus on investigating the educational methods for public health, we used the data from the following 3 parts: "The students' characteristics," "Whether or not students have completed the subject of public health," and "Nursing students' attitudes toward public health."

#### 1. Students' characteristics

Regarding the students' characteristics, we asked about age and academic year. The higher their academic year is, the closer they are to when they can take the national examination. Accordingly, nursing students may start studying for the national examination, and thereby increase their motivation to learn public health. The national examination covers a variety of specialized subjects. Because students have to study many other subjects, their motivation to learn public health

may decline. Moreover, the higher their academic year is, the clearer they are about their future occupations. The motivation to learn public health likely varies between the students who want to specialize in public health and those who do not. These matters are included in the items related to the attitudes toward public health. Therefore, even if academic year is included as an independent variable in the multiple linear regression analysis as described below in "Statistical analyses," we do not have a hypothesis about academic year in the present study. This item was used in our previous study (Kudo et al. 2013). However, in the present study, the academic year was not used in the statistical analyses.

#### 2. Whether or not students have completed the subject of public health

If the students had not yet completed the subject of public health, they could not answer the items related to their attitudes toward public health (see the Appendix, original version in Japanese). According to the interview with nursing teachers in accredited vocational schools, the academic year in which students learn public health varies among schools. In addition, even in the same school, academic year for students to take the subject of public health can change according to time schedule changes. Moreover, sometimes there are a few students who decide not to take public health in that academic year and instead opt to take it in a following year. On the other hand, there are a few students who entered vocational schools to obtain the registered nurses' certification after graduating from other schools. Some of those students have completed the subject of public health in their previous schools. Such students can answer the items regarding public health.

When the students take the subject of public health is unknown. Therefore, we asked the students to answer the following item: "Have you completed the subject of public health (including having completed public health at one or more schools)?" This is a yes/no question. The students, who answered "Yes" to this item, were asked to answer the items regarding "Nursing students' attitudes toward public health" as described below.

#### 3. Nursing students' attitudes toward public health

##### 3-1. Items causing a lack of nursing students' motivation to learn public health

We assumed that the reasons causing the lack of nursing students' motivation to learn public health were: "Difficulties in mathematical study," "A wide range of knowledge," "Lack of understanding the importance of learning public health," "Future plans that do not specialize in public health," "Thinking lightly about the national examination in the field of public health," and "Inappropriate attitudes of public health teachers." Each facet was composed of 4 items as shown in the Appendix. Each item in these facets was rated on a 7-point scale from "Definitely agree" to "Definitely disagree."

##### 3-2. Motivation to learn public health

Regarding "Motivation to learn public health," the subjects were asked to respond to the statement, "I actively want to learn as much public health as I can." This item was rated on a 7-point scale from "Definitely agree" to "Definitely disagree."

### *Statistical analyses*

Factor analysis (the principal factor method and promax rotation) of the items causing the lack of nursing students' motivation to

learn public health was performed. Factors with eigenvalues of  $\geq 1$  were retained. The Cronbach's alpha of each facet of items causing the lack of nursing students' motivation to learn public health was also calculated.

We calculated the Pearson's correlation coefficient between "Motivation to learn public health" and age. We also calculated the Pearson's correlation coefficients between "Motivation to learn public health" and each facet causing the lack of nursing students' motivation to learn public health. To investigate the factors associated with "Motivation to learn public health," standard partial regression coefficients were computed using multiple linear regression analysis. The "Motivation to learn public health" was a dependent variable. Age and facets causing the lack of nursing students' motivation to learn public health were independent variables.

PASW<sup>®</sup> Statistics 18.0 was used for all statistical analyses. The level of significance was set at  $P < 0.05$ .

*Analyzed subjects*

The questionnaires were collected from 3,668 of 5,108 subjects, with a return ratio of 71.8%. As mentioned above, we asked students, "Have you completed the subject of public health (including having completed public health at one or more schools)?" The questionnaires of the students who answered "No" to this item, and those of students who did not answer this item, were excluded from the analyses. The questionnaires in which students did not answer their age were also excluded from the analyses. Moreover, the questionnaires that had one or more missing values in the 25 items regarding "Nursing students' attitudes toward public health" were excluded from the analyses (see the Appendix). Consequently, the questionnaires of 1,553 respondents were analyzed.

**Results**

Table 1 shows the distributions of age and "Motivation to learn public health." The average age of the 1,553 students was 22.6 years old (standard deviation [S.D.], 5.2) and the range was from 18 to 45. As reference data, among the

Table 1. Distributions of age and "Motivation to learn public health."

Variables	<i>n</i>	%
<b>Age</b>		
≤ 19	312	20.1
20-29	1,054	67.9
30-39	156	10.0
≥ 40	31	2.0
<b>Motivation to learn public health</b>		
Definitely agree	47	3.0
Agree	95	6.1
Somewhat agree	246	15.8
Neither agree nor disagree	687	44.2
Somewhat disagree	166	10.7
Disagree	176	11.3
Definitely disagree	136	8.8
<b>Total</b>	<b>1,553</b>	<b>100</b>

1,553 students, there were 30 first-year students, 594 second-year students, and 928 third-year students. One student did not answer the academic year. That one student was an analyzed subject in the present study because we did not use the academic year in the statistical analyses (see the subheadings, "Students' characteristics," "Statistical analyses," and "Analyzed subjects").

We found the 5 reasons by factor analysis shown in Table 2. When we produced the items causing the lack of nursing students' motivation to learn public health, we assumed the two different facets: "Difficulties in mathematical study" and "A wide range of knowledge," as described in "Nursing students' attitudes toward public health." However, we found that these two facets were inseparable. Therefore, we named this facet, "Difficulty acquiring knowledge of public health."

We show the mean (S.D.) and Cronbach's alpha of each facet causing the lack of nursing students' motivation to learn public health in Table 3. The Cronbach's alphas of each facet were all  $\geq 0.7$ .

Table 4 shows the standard partial regression coefficients and Pearson's correlation coefficients. The independent variables of the multiple linear regression analysis are age and the 5 facets causing the lack of nursing students' motivation to learn public health. All of these independent variables were fixed in this model. "Motivation to learn public health" was significantly associated with age and those 5 facets. The variance inflation factors were  $< 2$  in all variables. The adjusted  $R^2$  value was 0.245.

**Discussion**

We investigated the facets causing the lack of motivation to learn public health. We subsequently examined the associations between the nursing students' "Motivation to learn public health" and these facets. We also examined whether or not age was significantly associated with students' "Motivation to learn public health."

"Difficulties acquiring knowledge of public health" was significantly associated with the students' "Motivation to learn public health." In the subject of public health, students must acquire a variety of knowledge, e.g., learn the laws regarding health care and check the latest data on health statistics such as diseases and mortalities. Such knowledge is one of the causes that nursing students lose their motivation to learn public health. Teachers must try not to make public health a weak subject for their students. For example, they may be able to improve their students' interest in statistics by instructing them how to calculate actual mortality rates. Teachers must do their best to increase students' interest so that they will acquire the necessary knowledge of public health.

We have taught public health to students who want to become professionals (e.g., registered nurses, physicians, and registered dietitians). We have frequently heard from many students that they have difficulties in mathematical study. They also have difficulties in acquiring a wide range

Table 2. Factor analysis of the items causing a lack of nursing students' motivation to learn public health.

Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
<b>Factor 1: Difficulties acquiring knowledge of public health</b>					
5. Difficulty with legal knowledge	<b>0.845</b>	-0.012	-0.017	-0.059	-0.002
4. Difficulty with statistics	<b>0.838</b>	-0.018	0.005	0.007	-0.016
6. Difficulty with general societal knowledge	<b>0.807</b>	0.025	-0.048	-0.012	-0.040
3. Difficulty using numbers	<b>0.802</b>	-0.017	-0.010	0.040	-0.032
7. Many things to be learned	<b>0.753</b>	0.030	-0.061	0.015	0.028
1. Difficulty interpreting statistical data	<b>0.674</b>	0.020	0.074	-0.018	-0.033
8. Difficulty regarding differences from other specialized subjects	<b>0.660</b>	0.115	-0.024	0.093	0.061
2. Difficulty updating the latest data	<b>0.580</b>	-0.104	0.086	-0.062	0.060
<b>Factor 2: Inappropriate attitudes of public health teachers</b>					
22. Irresponsibility for teaching public health	-0.021	<b>0.887</b>	0.026	-0.010	-0.019
23. Bad manners	-0.069	<b>0.827</b>	-0.014	0.008	-0.041
21. Lack of enthusiasm	0.046	<b>0.776</b>	0.002	-0.008	0.004
24. Unfriendliness	0.071	<b>0.659</b>	0.031	-0.037	0.059
<b>Factor 3: Thinking lightly about the national examination in the field of public health</b>					
19. Possibility to pass the national examination without particularly making public health one of my strong subjects	-0.014	-0.009	<b>0.926</b>	-0.101	0.003
18. Only one subject out of many subjects in the national examination	-0.018	0.033	<b>0.854</b>	-0.008	-0.075
20. Prioritizing other subjects over public health for the national examination	0.067	-0.040	<b>0.671</b>	0.069	0.099
17. Possibility to pass the national examination without learning public health that well	-0.039	0.110	<b>0.478</b>	0.246	-0.022
<b>Factor 4: Lack of understanding the importance of learning public health</b>					
10. Public health not necessarily being a required subject	0.008	0.044	-0.043	<b>0.894</b>	-0.053
11. Working well with a little knowledge of public health	-0.055	-0.032	-0.001	<b>0.868</b>	0.018
9. Being weak in public health not affecting work	0.014	-0.041	0.012	<b>0.794</b>	-0.037
12. Many specialized subjects that should be prioritized over public health	0.070	-0.067	0.147	<b>0.387</b>	0.195
<b>Factor 5: Future plans that do not specialize in public health</b>					
14. Not interested in work specializing in public health	-0.037	0.069	-0.048	0.016	<b>0.871</b>
13. Not desiring to work for an institution with the responsibility for public health	-0.048	0.066	-0.059	-0.007	<b>0.783</b>
15. Not intending to become a specialist in public health	0.038	-0.089	0.074	-0.034	<b>0.643</b>
16. Providing nursing services to ill people rather than to healthy people	0.058	-0.060	0.027	-0.017	<b>0.419</b>
<b>Interfactor correlations</b>					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1: Difficulties acquiring knowledge of public health	1				
Factor 2: Inappropriate attitudes of public health teachers	0.120	1			
Factor 3: Thinking lightly about the national examination in the field of public health	0.134	0.214	1		
Factor 4: Lack of understanding the importance of learning public health	0.278	0.289	0.572	1	
Factor 5: Future plans that do not specialize in public health	0.320	0.167	0.353	0.456	1

Bold-faced type shows factor loadings  $\geq 0.4$ .

For the factor analysis (the principal factor method and promax rotation), for each item causing a lack of nursing students' motivation to learn public health, 1 to 7 points were given in the order from "Definitely disagree" to "Definitely agree" (see the Appendix). Factors with eigenvalues of  $\geq 1$  were retained. These 5 factors accounted for 66.14% of the total variance of the 24 items before the rotation, and the eigenvalues of factors 1 to 5 were: 6.553, 3.793, 2.538, 1.739, and 1.251, respectively.

of knowledge. Although the number of items of "Difficulties acquiring knowledge of public health" is 8, and the other 4 facets have 4 items each, the mean value of "Difficulties acquiring knowledge of public health" is rela-

tively higher than those of the other facets as shown in Table 3. This is consistent with our educational experience. We think that many other public health teachers also feel that the difficulties in acquiring the knowledge of public

Table 3. Means, standard deviations, and Cronbach’s alphas.

Facets causing a lack of nursing students’ motivation to learn public health	Number of items	Mean	Standard deviation	Cronbach’s alpha
Factor 1: Difficulties acquiring knowledge of public health	8	41.02	8.35	0.909
Factor 2: Inappropriate attitudes of public health teachers	4	10.78	5.28	0.863
Factor 3: Thinking lightly about the national examination in the field of public health	4	15.75	5.01	0.848
Factor 4: Lack of understanding the importance of learning public health	4	16.58	4.69	0.846
Factor 5: Future plans that do not specialize in public health	4	18.65	4.83	0.766

To calculate the means, standard deviations, and Cronbach’s alphas, the following system was used. Regarding the items for each facet causing a lack of nursing students’ motivation to learn public health, 1 to 7 points were given in the order from “Definitely disagree” to “Definitely agree.” As shown in Table 2, because the “Difficulties acquiring knowledge of public health” was composed of 8 items, the range of the score of each facet per analyzed subject could be from 8 to 56. Because the other facets were composed of 4 items, the range of the score of each facet per analyzed subject could be from 4 to 28.

Table 4. Factors associated with “Motivation to learn public health.”

Variables	r	P	$\beta$	P	VIF
Age	-0.004	0.879	-0.050	0.027	1.055
Factor 1: Difficulties acquiring knowledge of public health	-0.191	< 0.001	-0.053	0.024	1.134
Factor 2: Inappropriate attitudes of public health teachers	-0.202	< 0.001	-0.090	< 0.001	1.082
Factor 3: Thinking lightly about the national examination in the field of public health	-0.370	< 0.001	-0.185	< 0.001	1.502
Factor 4: Lack of understanding the importance of learning public health	-0.375	< 0.001	-0.151	< 0.001	1.659
Factor 5: Future plans that do not specialize in public health	-0.384	< 0.001	-0.247	< 0.001	1.241
Adjusted $R^2 = 0.245$					

r, Pearson’s correlation coefficient;  $\beta$ , standard partial regression coefficient; VIF, variance inflation factor.

To calculate Pearson’s correlation coefficients and standard partial regression coefficients, the following system was used. Concerning “Motivation to learn public health,” 1 to 7 points were given in the order from “Definitely disagree” to “Definitely agree.” Concerning age, the actual age was used as a continuous variable. Regarding the items for each facet causing the lack of nursing students’ motivation to learn public health, 1 to 7 points were given in the order from “Definitely disagree” to “Definitely agree” (see Table 2 and the Appendix). And the 5 summed scores of the items for each facet were used. The summed score of “Difficulties acquiring knowledge of public health” was the total of the 1 to 7 points given for each item: 1. “Difficulty interpreting statistical data” + 2. “Difficulty updating the latest data” + 3. “Difficulty using numbers” + 4. “Difficulty with statistics” + 5. “Difficulty with legal knowledge” + 6. “Difficulty with general societal knowledge” + 7. “Many things to be learned” + 8. “Difficulty regarding differences from other specialized subjects.” The summed score of “Inappropriate attitudes of public health teachers” was the total of the 1 to 7 points given for each item: 21. “Lack of enthusiasm” + 22. “Irresponsibility for teaching public health” + 23. “Bad manners” + 24. “Unfriendliness.” The summed score of “Thinking lightly about the national examination in the field of public health” was the total of the 1 to 7 points given for each item: 17. “Possibility to pass the national examination without learning public health that well” + 18. “Only one subject out of many subjects in the national examination” + 19. “Possibility to pass the national examination without particularly making public health one of my strong subjects” + 20. “Prioritizing other subjects over public health for the national examination.” The summed score of “Lack of understanding the importance of learning public health” was the total of the 1 to 7 points given for each item: 9. “Being weak in public health not affecting work” + 10. “Public health not necessarily being a required subject” + 11. “Working well with a little knowledge of public health” + 12. “Many specialized subjects that should be prioritized over public health.” The summed score of “Future plans that do not specialize in public health” was the total of the 1 to 7 points given for each item: 13. “Not desiring to work for an institution with the responsibility for public health” + 14. “Not interested in work specializing in public health” + 15. “Not intending to become a specialist in public health” + 16. “Providing nursing services to ill people rather than to healthy people.”

health discourage students from learning. Thus, some public health teachers may only consider their students’ difficulties in acquiring the knowledge of public health. However, our multiple linear regression analysis shows that all of the other facets are significantly associated with the motivation to learn public health (see Table 4). Therefore, it is necessary to consider how to educate students in public health from various viewpoints.

“Inappropriate attitudes of public health teachers” was

significantly associated with the students’ lack of “Motivation to learn public health.” We think that this result also applies to other subjects as well. If teachers’ attitudes are poor, students lose their motivation to learn about the subjects they teach. Accordingly, teachers need to be very careful about their attitudes. Moreover, schools should give the students opportunities to state their opinions about their teachers. For example, conducting questionnaire surveys regarding their teachers’ attitudes could be

one possible way of achieving this. If teachers and students evaluate each other's attitudes, it may help to create a better educational atmosphere.

"Thinking lightly about the national examination in the field of public health" was significantly associated with the students' "Motivation to learn public health." After graduating, students must pass the national examination to obtain their certification to become registered nurses. Accordingly, passing the national examination becomes the primary goal for students. They can gain confidence about passing the national examination by studying questions about public health that were in past national examinations. This, in itself, may help motivate them to learn public health.

"Lack of understanding the importance of learning public health" was significantly associated with the students' lack of "Motivation to learn public health." In clinical settings, when patients recover, their health care providers immediately feel that their efforts have been rewarded. However, public health attaches a high value to health care services for healthy people as well as patients by enhancing preventive medicine. Preventive medicine does not show its efficacy immediately. Therefore, students may think that it is hard to understand the beneficial results of their efforts to study public health as well as they could. There are many various data from studies suggesting that public health is very important for people's general health, e.g., "7 health habits" (Belloc and Breslow 1972) and Framingham's studies (Dawber et al. 1957, 1959; Kannel et al. 1979; Wilson et al. 1998). We think that if teachers clearly show their students these actual data, that they would better understand the importance of public health.

Registered nurses need to promote healthy people and patients to emphasize preventive health behaviors. To do so, they have to recognize the importance of acquiring the knowledge of public health. Public health can affect the health status of healthy people and patients. It is necessary to conduct research to obtain evidence that registered nurses' knowledge of public health influences the health status of healthy people and patients. Such evidence would naturally become data for realizing the importance of learning public health for students. Moreover, this evidence also becomes reference material used by public health teachers to teach it. These topics warrant further research.

The facet, "Future plans that do not specialize in public health" was significantly associated with the students' lack of "Motivation to learn public health." Therefore, it may be natural that students who do not specialize in public health lose interest in it. However, public health plays an important role for promoting preventive medicine. Therefore, it is a fundamental subject for all health care professionals. In Japan, lifestyle-related diseases are major causes of death (Health, Labor and Welfare Statistics Association 2012a; Ministry of Health, Labour and Welfare 2013). Therefore, for registered nurses to offer appropriate nursing services, it is necessary to teach students that public

health is an indispensable subject.

In the present study, we discovered that older students significantly were less motivated to learn public health than were younger students. However, in our previous study (Kudo et al. 2013), we found that older students were significantly more motivated to acquire technical knowledge than were younger students. Thus, the results of the present study were opposite from those of our previous study. Older students already practice preventive health behaviors in their daily lives. Married students, especially, always think about their families' health, e.g., balanced diet and food sanitation. If they have children, they also learn about children's health in their daily lives (e.g., vaccination policy for infants and pediatric diseases). However, these matters warrant further study.

The adjusted  $R^2$  is 0.245. Therefore, we would like to study the items other than those that cause a lack of motivation in the future. Moreover, the present study focuses on nursing students in vocational schools that allow graduation after only a 3-year period of study. In Japan, the most common way to become a registered nurse is for a nursing student to study at an accredited nursing educational institute for 3 or more years after graduating from senior high school (Health, Labor and Welfare Statistics Association 2012a). Those educational institutes can be classified as vocational schools, junior colleges, colleges and universities. Students in vocational schools most commonly graduate after 3 years of study. However, some vocational schools provide education so that students can graduate after 4 years of study. Nursing students in vocational schools who can graduate after 4 years of study and those from junior colleges, colleges and universities may have various facets causing them to have the lack of motivation to learn public health. Public health is an important subject for students who want to become other kinds of professionals as well, such as physicians, pharmacists, and registered dietitians. We have future plans to study the attitudes toward public health among these other professionals.

It is important to research the facets that motivate public health teachers to educate students. In addition, not all public health teachers have the certification of professional nurses. When those teachers instruct nursing students, they could become confused about how to teach their students well. And if so, they may not be able to teach public health. On the other hand, public health teachers, who do not have a professional nurse's certification, may be able to help nursing students broaden their viewpoints. We plan to research how nursing students are influenced when teachers without a professional nurse's certification teach public health. This is also true for other professionals (e.g., physicians, pharmacists, and registered dietitians).

We also realize the necessity to research the curriculum of public health. Because public health includes a broad range of subfields, some teachers spend excessive time teaching specific subfields (e.g., epidemiology and health statistics) and do not teach other subfields. If they do

so, the academic abilities of those students will lack uniformity. We intend to collect data on how much time teachers allocate for each subfield and discuss public health curriculum. It is necessary to establish a training course for teachers to effectively teach public health.

To achieve high quality of nursing services, registered nurses have to solve various problems by studying nursing care in their daily clinical activities. When we conducted a variety of surveys for nurses in many hospitals (Kudo et al. 2010, 2011, 2012), many nursing departments instructed their nurses to research various topics. To that end, professional nurses continue studying epidemiology and statistics even after obtaining the certification of professional nurses. Because studying various problems in clinical settings is important to improve the quality of health care, it is also important for other clinical professions. Public health is a basic subject for health care research, not only preventive medicine. Therefore, we plan to study how to assist the research among various health care professionals.

*Limitations:* There were two limitations in this study. The first limitation was that because a cross-sectional design was used; namely, it was difficult to identify causal relations. The second limitation was that the participating vocational schools in the present study were only in Chiba and Kanagawa prefectures. In one school in Chiba, the person in charge of distributing questionnaires distributed them to both the male and female students by mistake, which was not according to the study protocol. Therefore, the subjects in that school were not analyzed. Thus, the generalizability of our results was limited. It will be necessary to investigate more nursing vocational schools in many other prefectures.

In conclusion, we have identified five reasons that lead to the lack of nursing students' motivation to learn public health: "Difficulties acquiring knowledge of public health," "Inappropriate attitudes of public health teachers," "Thinking lightly about the national examination in the field of public health," "Lack of understanding the importance of learning public health," and "Future plans that do not specialize in public health." It is easily understandable that "Motivation to learn public health" was significantly associated with all of these facets. Moreover, older nursing students significantly have less motivation to learn public health than do younger students. It is important that public health teachers recognize the predictors that discourage students to learn public health. They should strive to teach so that students learn as much public health as they can.

### Conflict of Interest

The authors declare no conflict of interest.

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## Appendix

Questionnaire items (original version in Japanese)

### Whether or not students have completed the subject of public health

Have you completed the subject of public health (including having completed public health at one or more schools)?

### Nursing students' attitudes toward public health

#### *Difficulties in mathematical study*

1. I think it is difficult to interpret statistical data regarding public health.

2. Statistical data on public health is frequently updated, so I think it is difficult to understand the latest data.

3. I think public health is difficult because numbers are used a lot.

4. I think public health is difficult because knowledge of statistics is necessary.

#### *A wide range of knowledge*

5. I think public health is difficult because legal knowledge is necessary.

6. I think public health is difficult because general societal knowledge is necessary.

7. Public health is difficult because there are many things that have to be learned.

8. I am weak in public health because it generally differs from other specialized subjects.

#### *Lack of understanding the importance of learning public health*

9. Even though I am weak in public health, I do not think it makes working as a registered nurse problematic.

10. I do not think public health is necessarily a required subject to work as a registered nurse.

11. I think I can do appropriate work required of registered nurses even with a little knowledge of public health.

12. Working as a registered nurse, I think there are many other specialized subjects that I should prioritize over public health.

#### *Future plans that do not specialize in public health*

13. I don't want to work for an institution that has the responsibility for public health (e.g., a public health center or a company working in occupational health).

14. I am not interested in work that specializes in public health.

15. I do not intend to become a specialist in public health.

16. I want to provide nursing services to people who are suffering from illnesses rather than to healthy people.

#### *Thinking lightly about the national examination in the field of public health*

17. I think I can pass the national examination for registered nurses even though I did not learn public health that well.

18. Even though I am a little weak in public health, it being only one subject out of many specialized subjects, I think I can pass the national examination for registered nurses.

19. I think it is possible to pass the national examination for registered nurses without particularly making public health one of my strong subjects.

20. To pass the national examination for registered nurses, I think it would be better to prioritize learning other specialized subjects over learning public health so thoroughly.

#### *Inappropriate attitudes of public health teachers*

21. I think my public health teachers generally lacked enthusiasm.

22. I think my public health teachers were generally irresponsible for teaching.

23. I think my public health teachers generally had bad manners.

24. I did not feel my public health teachers were friendly.

#### *Motivation to learn public health*

25. I actively want to learn as much public health as I can.