Predictors of female registered nurses’ interest in enrolling in master’s programs of nursing graduate schools in Japan

Taeko Toyoda¹,², Yasushi Kudo¹,², Noriko Hagi¹,², Yasuko Toyoshima¹, and Keiko Kono²

¹ School of Nursing, Yokkaichi Nursing and Medical Care University, Japan
² Research Center for Occupational Health Nursing, Yokkaichi Nursing and Medical Care University, Japan

Abstract

Objective: Enrollment in graduate schools presents a useful opportunity for registered nurses to enhance their expertise in their nursing field and gain better opportunities to achieve their desired career advancements. This study investigates the predictors associated with registered nurses’ interest in enrolling in master’s programs of nursing graduate schools.

Materials and Methods: For the predictors associated with interest in enrolling in master’s programs of nursing science, we evaluated items related to registered nurses’ perceptions of their work environments and their impressions regarding master’s programs in nursing. The analyzed subjects were 3,611 female registered nurses working in 30 hospitals in Mie prefecture, Japan. Multiple linear regression analyses were conducted to investigate registered nurses’ predictors of interest in enrolling in master’s programs of nursing graduate schools. We included the variables with Variance Inflation Factor (VIF) less than (<) 2 in the statistical model.

Results: Full-time nurses were more interested in enrolling in master’s programs than part-time nurses. Registered nurses who felt that they could keep up with courses in graduate schools, that they would be able to acquire skills to contribute to society, and that their colleagues were competent, showed stronger interest in master’s programs. Registered nurses who were under the impression that graduate school teachers were dedicated to their students showed lower interest in master’s programs. Registered nurses who felt that their superiors were competent and that they were expected to perform well by physicians also showed lower interest in master’s programs.

Conclusion: Predictors significantly associated with registered nurses’ interest in enrolling in master’s programs of nursing graduate schools were determined. Further studies are required to gain a more detailed understanding of the nurses’ attitudes investigated.

Key words: master’s program, nursing graduate school, registered nurse, questionnaire (J Rural Med 2019; 14(1): 26–35)

Introduction

In Japan, registered nurses that do not have a bachelor’s degree in nursing are able to enroll in master’s programs at graduate schools³. Therefore, graduate schools in Japan are open to many registered nurses. Enrollment in graduate schools presents a useful opportunity for registered nurses to enhance their expertise in their nursing field and gain better opportunities to achieve the career advancements they desire.

A number of descriptive studies published in Japan have examined the needs and wishes of nurses working in hospitals who are considering enrolling in nursing graduate schools³-⁸]. These previous studies suggest that most registered nurses who hope to enroll in graduate schools wish to continue working while studying. Therefore, graduate school staff should assist graduate students with their studies (e.g., through arrangements that allow students to complete the curriculum beyond the standard period of study, by offering lectures at night and on weekends, and also by providing economic support). However, registered nurses will not feel encouraged to go to graduate school unless they are interested in enrolling in graduate school. It is important to investigate what kind of registered nurses are interested in enrolling in graduate schools.

In Austria, Ng et al. investigated the attitudes of reg-
istered nurses toward postgraduate education. They conducted a factor analysis of these attitudes and identified three factors from the results: to become facilitators, to achieve professional recognition, and inhibiting factors. The “facilitators” factor accounted for 28.5% of variance and encompassed six items: improving nurses’ knowledge, increasing nurses’ confidence in clinical decision-making, enhancing nurses’ careers, improving nurses’ critical thinking, improving nurses’ clinical skills, and increasing job satisfaction. They reported that these six items support and attract registered nurses to pursue a postgraduate education. However, their study did not examined the importance of registered nurses’ interest in enrolling in master’s programs of nursing science.

Nurses’ perceptions of their work environments may influence their interest in enrolling in a graduate school. For example, if nurses find their colleagues working in a clinical setting to be competent, they may experience favorable stimulation from their colleagues and their interest in studying at the graduate level may increase. Further, nurses’ impressions regarding graduate school may influence their interest in enrollment. For example, nurses’ interest in career promotion through graduate school may be weakened if they have the impression that graduate school lectures are difficult to understand.

This study aimed to explore factors associated with interest in enrollment in nursing science master’s programs. To the best of our knowledge, no previous studies have focused on this topic. We investigated registered nurses’ perceptions of their work environments and their impressions regarding graduate school using factor analyses. Thereafter, we examined the associations between these factor scores and nurses’ interest in enrolling in a graduate school.

Methods

Distribution and collection of questionnaires

Questionnaires were distributed and collected from September to December 2017. As the number of male registered nurses was much lower than that of female registered nurses, males were excluded as subjects. The study subjects were 5,675 female registered nurses working at 30 hospitals in Mie prefecture in Japan. We distributed a package with an anonymous self-rated questionnaire (original version in Japanese), documents explaining the study, and a return envelope to the subjects. Approximately two weeks after the distribution, the completed questionnaires were collected in sealed envelopes to ensure truthful answers. The questionnaires were collected via collection boxes kept in the participating hospitals.

Question items of the questionnaire

The question items in this study are classified into the following categories: (1) demographic characteristics (age, marital status [married, single], with/without children, employment status [full-time worker, part-time worker]); (2) items related to nursing research and work environment; (3) present state of enrollment in a master’s program of a nursing graduate school; (4) “Impressions regarding the master’s programs of nursing graduate schools” (1 to 20 in Appendix A) and “Interest in enrolling in a master’s program of a nursing graduate school” (21 in Appendix A); and (5) registered nurses’ perceptions of their work environments (1 to 20 in Appendix B). Because the purpose of this study is to explore the predictors associated with nurses’ “Interest in enrolling in a master’s program of a nursing graduate school”, items in category (2) related to nursing research and the work environment are not included for analyses in the present study.

For category (3), participants were asked to select an option from “Not enrolled yet”, “Completed”, and “Currently enrolled”. Participants who selected “Not enrolled yet” for this question were asked to respond to the questions in categories (4) and (5). Participants who selected “Completed” and “Currently enrolled” were asked to submit the questionnaire enclosed in the envelope.

For “Interest in enrolling in a master’s program of a nursing graduate school”, the participants were asked to respond to the statement, “I am interested in enrolling in a master’s program of a nursing graduate school” (Item 21 in Appendix A). For “Impressions regarding the master’s programs of nursing graduate schools”, we hypothesized that the following four factors would be relevant: “Being able to keep up with courses in graduate schools” (1 to 5 in Appendix A), “Dedication of graduate school teachers to their students” (6 to 10 in Appendix A), “Acquiring advanced expertise” (11 to 15 in Appendix A), and “Being able to acquire skills to contribute to society” (16 to 20 in Appendix A). These questions were rated on a 7-point scale from “Definitely agree” to “Definitely disagree”.

For category (5), we hypothesized that the following four factors would be relevant: “Competent colleagues” (1 to 5 in Appendix B), “Competent superiors” (6 to 10 in Appendix B), “ Physicians’ expectations of registered nurses” (11 to 15 in Appendix B), and “Work environment to continue learning” (16 to 20 in Appendix B). Answers to these questions were rated on a 7-point scale from “Definitely agree” to “Definitely disagree”.

Analyzed subjects

Among 5,675 questionnaires delivered, 4,495 questionnaires were collected. The questionnaires that had one or more missing values in terms of the items used in this study...
were excluded. Further, with reference to category (3), we excluded 18 registered nurses who reported “Completed” and 8 who reported “Currently enrolled”. As a result, 3,611 registered nurses were analyzed.

**Analytical method**

For “Impressions regarding the master’s programs of nursing graduate schools” (1 to 20 in Appendix A) and “Perceptions of the work environment” (1 to 20 in Appendix B), we conducted factor analysis (the principal factor method and promax rotation), respectively. Cronbach’s alpha coefficient for each factor was also calculated.

To investigate the relationships between “Interest in enrolling in a master’s program of a nursing graduate school” and other variables, we calculated Pearson correlation coefficients or conducted Mann-Whitney U tests. In addition, standardized partial regression coefficients were calculated using forced-entry multiple regression analyses. “Interest in enrolling in a master’s program of a nursing graduate school” was a dependent variable. The factor scores calculated by the factor analyses and the demographic characteristics were the independent variables.

The Variance Inflation Factor (VIF) is useful as an index for measuring the possibility of multicollinearity\(^{18, 19}\). If the VIF is less than \(<2\), multicollinearity will not be considered\(^{20}\). Therefore, we fixed the variables with VIF less than \(<2\) in the statistical model used in this study.

The level of statistical significance was set at \(P<0.05\). We used the IBM SPSS Statistics Ver. 25.0 software for all analyses.

**Ethical considerations**

The study was conducted with the approval of the Ethics Committee of Yokkaichi Nursing and Medical Care University (No. 123).

**Results**

Table 1 shows the distributions of demographic characteristics and the variable associated with “Interest in enrolling in a master’s program of a nursing graduate school”. The average age of the analyzed subjects was 37.6 years (standard deviation, 11.2). For the item “Interest in enrolling in a master’s program of a nursing graduate school”, the most frequent answer was “Definitely disagree” (34.9%). Regarding respondents’ marital status, the Mann-Whitney U test showed there to be a significant difference in “Interest in enrolling in a master’s program of a nursing graduate school”. The Mann-Whitney U test showed there to be a significant difference in “Interest in enrolling in a master’s program of a nursing graduate school”. Moreover, “Interest in enrolling in a master’s program of a nursing graduate school” had significant correlations with “Being able to acquire skills to contribute to society” \((r=0.410, P<0.001)\) and “Acquiring advanced expertise” \((r=0.410, P<0.001)\). The Pearson’s correlation coefficient of “Being able to acquire skills to contribute to society” was higher than that of “Acquiring advanced expertise”. Therefore, we excluded “With/without children” and “Acquiring advanced expertise” in the statistical model and then conducted the multiple regression analysis again.
As shown in Table 4, the values of VIF were less than (<) 2 for all variables in the final statistical model. Variables that were significantly associated with “Interest in enrolling in a master’s program of a nursing graduate school” were as follows: “Employment status”, “Being able to keep up with courses in graduate schools”, “Dedication of graduate school teachers to their students”, “Being able to acquire skills to contribute to society”, “Competent superiors”, “Competent colleagues”, and “Physician expectations of registered nurses”. The adjusted R² value was 0.270.

“Interest in enrolling in a master’s program of a nursing graduate school” had significant positive correlations with “Dedication of graduate school teachers to their students” (r=0.222, P<0.001), “Competent superiors” (r=0.090, P<0.001), and “Physician expectations of registered nurses” (r=0.102, P<0.001). However, the standardized partial regression coefficients associated with “Dedication of graduate school teachers toward their students”, “Competent superiors”, and “Physician expectations of registered nurses” were –0.117 (P<0.001), –0.052 (P=0.008), and –0.072 (P<0.001), respectively. The signs of the standard partial regression coefficients of these three variables changed to negative.

### Discussion

We investigated the predictors associated with “Interest in enrolling in a master’s program of a nursing graduate school”. “Interest in enrolling in a master’s program of a nursing graduate school” was significantly associated with “Employment status”, “Being able to keep up with courses in graduate schools”, “Dedication of graduate school teachers to their students”, “Being able to acquire skills to contribute to society”, “Competent superiors”, “Competent colleagues”, and “Physician expectations of registered nurses”.

The registered nurses who feel that they will be able to keep up with courses in graduate schools showed a significantly higher interest in enrolling in nursing science master’s programs. If registered nurses think that learning at a graduate school is very difficult, they may worry about whether they will be able to acquire the skills and knowledge required in nursing even if they enroll in and study at a graduate school. Registered nurses may be anxious about whether they will be able earn the required credits after admission and successfully complete the master’s degree course. If registered nurses have such anxiety, they may not try to enroll in a graduate school.

On the other hand, because graduate education requires students to absorb more advanced nursing skills and knowledge than undergraduate and vocational school graduates, graduate schools do not accept students with low academic performance. Therefore, it is important for graduate school teachers to sufficiently explain the difficulty level of graduate school education to registered nurses. This will make it possible for registered nurses to consider whether they will be able to keep up with graduate school education.

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**Table 1** Distributions of demographic characteristics and the variable “Interest in enrolling in a master’s program of a nursing graduate school”

| Variable          | Definitely disagree | Mostly disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Mostly agree | Definitely agree | Total       | Pearson’s correlation coefficient and Mann-Whitney U test |
|-------------------|---------------------|-----------------|-------------------|---------------------------|---------------|--------------|-----------------|------------|------------------------------------------------------|
| Age               | 356 (31.4%)         | 120 (10.3%)     | 74 (6.3%)         | 203 (17.2%)               | 155 (13.7%)   | 28 (2.5%)    | 16 (1.4%)       | 1,134 (100%) | P=0.010<sup>a</sup>                                  |
| 20–29             | 336 (36.9%)         | 120 (11.2%)     | 69 (7.6%)         | 224 (24.6%)               | 112 (12.3%)   | 29 (3.2%)    | 21 (2.3%)       | 911 (100%)   | –0.023 (P=0.162)<sup>b</sup> |
| 30–39             | 331 (35.4%)         | 120 (12.8%)     | 58 (6.2%)         | 242 (25.9%)               | 134 (14.3%)   | 26 (2.8%)    | 24 (2.6%)       | 935 (100%)   |                                      |
| 40–49             | 208 (38.1%)         | 81 (14.8%)      | 29 (5.3%)         | 142 (26.0%)               | 60 (11.0%)    | 18 (3.3%)    | 8 (1.5%)        | 546 (100%)   |                                      |
| 50–59             | 31 (36.5%)          | 12 (14.1%)      | 0 (0.0%)          | 26 (30.6%)                | 11 (12.9%)    | 4 (4.7%)     | 1 (1.2%)        | 85 (100%)    |                                      |
| ≥60               | 732 (37.2%)         | 270 (13.7%)     | 120 (6.1%)        | 513 (26.1%)               | 243 (12.3%)   | 56 (2.8%)    | 34 (1.7%)       | 1,968 (100%) |                                      |
| Marital status    |                     |                 |                   |                          |               |              |                 |            |                                      |
| Married           | 530 (32.3%)         | 245 (14.9%)     | 130 (7.9%)        | 424 (25.8%)               | 229 (13.9%)   | 49 (3.0%)    | 36 (2.2%)       | 1,643 (100%) |                                      |
| Single            | 702 (37.4%)         | 250 (13.3%)     | 105 (5.6%)        | 487 (25.9%)               | 251 (13.4%)   | 50 (2.7%)    | 32 (1.7%)       | 1,877 (100%) |                                      |
| With/without children |              |                 |                   |                          |               |              |                 |            |                                      |
| With children     | 560 (32.3%)         | 265 (15.3%)     | 145 (8.4%)        | 450 (26.0%)               | 221 (12.7%)   | 55 (3.2%)    | 38 (2.2%)       | 1,734 (100%) |                                      |
| Without children  | 1,109 (37.4%)       | 453 (14.2%)     | 222 (6.9%)        | 842 (26.3%)               | 420 (13.1%)   | 91 (2.8%)    | 63 (2.0%)       | 3,200 (100%) |                                      |
| Employment status |                     |                 |                   |                          |               |              |                 |            |                                      |
| Full-time worker  | 153 (37.2%)         | 62 (15.1%)      | 28 (6.8%)         | 95 (23.1%)                | 52 (12.7%)    | 14 (3.4%)    | 7 (1.7%)        | 411 (100%)   |                                      |
| Part-time worker  | 1,262 (34.9%)       | 515 (14.3%)     | 250 (6.9%)        | 937 (25.9%)               | 472 (13.1%)   | 105 (2.9%)   | 70 (1.9%)       | 3,611 (100%) |                                      |

To calculate a Pearson’s correlation coefficient or conduct Mann-Whitney U tests, the following system was used. Respondent’s age was used as a continuous variable. Concerning “Interest in enrolling in a master’s program of a nursing graduate school”, 1 to 7 points were given in the order from definitely disagree to definitely agree. <sup>a</sup> Pearson’s correlation coefficient. <sup>b</sup> Mann-Whitney U test.
Registered nurses who felt that graduate school teachers are dedicated to their students showed a significantly lower interest in enrolling in master’s programs. This result is contrary to our hypothesis. There are many reports of students being harassed by faculty members in Japanese universities. Even if teachers intend to provide enthusiastic instruction to students, some students may perceive this negatively, thinking that the attitudes of teachers are excessively strict. Some registered nurses in graduate school who are continuing employment may feel anxious because they must balance work and studies. It is necessary for graduate school teachers to be aware of the potential to be misunderstood while instructing students.

Registered nurses who felt that they would be able to acquire skills to contribute to society were significantly more interested in enrolling in master’s programs. If they enroll in a graduate school, they will spend large amounts of time studying at the graduate school. Some registered nurses may think that concentrating on clinical activities will contribute more to society than acquiring knowledge from books. Therefore, such nurses may not value graduate schools. After registered nurses graduate, graduate school teachers should inform them about what kinds of nursing skills and expertise they can be expected to have acquired. Registered nurses can better evaluate the kind of social contribution they will be able to make in the future after they have completed a master’s program.

Registered nurses who felt that their superiors were competent and that they were expected to perform well by physicians were significantly less interested in enrolling in

### Table 2  Factor analysis of impressions regarding the master’s programs of nursing graduate schools

| Factor                                      | 1     | 2     | 3     | 4     |
|---------------------------------------------|-------|-------|-------|-------|
| 1. Acquiring advanced expertise (Cronbach’s α=0.945) |       |       |       |       |
| 12. Thinking based on evidence              | 0.914 | 0.001 | 0.011 | −0.010 |
| 13. Gaining expertise that cannot be acquired by only working at clinical sites | 0.902 | −0.013 | −0.006 | −0.016 |
| 14. Enabling logical thinking               | 0.860 | −0.011 | −0.014 | 0.060 |
| 11. Developing expertise in nursing         | 0.798 | 0.010 | 0.089 | −0.003 |
| 15. Acquiring broad perspectives            | 0.766 | −0.010 | −0.026 | 0.162 |
| 2. Being able to keep up with courses in graduate schools (Cronbach’s α=0.918) |       |       |       |       |
| 4. Dealing with subjects                    | −0.077 | 0.929 | 0.011 | 0.027 |
| 3. Understanding the textbooks              | 0.003 | 0.919 | 0.006 | −0.014 |
| 5. Earning credits                          | −0.017 | 0.910 | <0.001 | −0.014 |
| 1. Keeping up with lectures                 | −0.031 | 0.838 | −0.020 | 0.002 |
| 2. Acquiring skills for research            | 0.213 | 0.557 | 0.024 | 0.041 |
| 3. Dedication of graduate school teachers to their students (Cronbach’s α=0.910) |       |       |       |       |
| 7. Kind instruction                         | 0.025 | 0.018 | 0.892 | −0.076 |
| 9. Advising students on problems            | −0.082 | −0.039 | 0.888 | 0.089 |
| 10. Taking time to answer questions on student research | 0.076 | −0.016 | 0.795 | −0.012 |
| 8. Attractive personalities                 | −0.045 | −0.042 | 0.770 | 0.158 |
| 6. Not being overbearing toward their students | 0.073 | 0.092 | 0.709 | −0.107 |
| 4. Being able to acquire skills to contribute to society (Cronbach’s α=0.905) |       |       |       |       |
| 17. Contribution to societal development     | −0.042 | 0.020 | −0.019 | 0.923 |
| 16. Contribution to raising the quality of people’s lives | −0.014 | 0.002 | −0.030 | 0.865 |
| 18. Contribution to raising the quality of nursing services | 0.149 | 0.005 | −0.002 | 0.773 |
| 19. Contribution to improving problems at the nursing work site | 0.140 | −0.003 | 0.032 | 0.696 |
| 20. Expecting registered nurses to gain highly specialized expertise | 0.006 | <0.001 | 0.066 | 0.592 |

Inter factor correlations

| 1. Acquiring advanced expertise | 1     |
| 2. Being able to keep up with courses in graduate schools | 0.287 | 1     |
| 3. Dedication of graduate school teachers to their students | 0.593 | 0.331 | 1     |
| 4. Being able to acquire skills to contribute to society | 0.726 | 0.290 | 0.562 | 1     |

To conduct factor analysis (the principal factor method and promax rotation), the following system was used. Concerning each item of impressions regarding the master’s programs of nursing graduate schools, 1 to 7 points were given from definitely disagree to definitely agree. Bold-faced type shows factor loadings ≥0.4. To calculate the Cronbach’s alpha of each factor, 1 to 7 points were given in the order from definitely disagree to definitely agree. a,b: Factor loadings can become either positive (+) or negative (−), and we therefore used the absolute value.
Table 3  Factor analysis of registered nurses’ perceptions of their work environment

| Factor                                                                 | 1     | 2     | 3     | 4     |
|------------------------------------------------------------------------|-------|-------|-------|-------|
| 1. Work environment to continue learning (Cronbach’s α=0.958)          |       |       |       |       |
| 18. The need to develop nursing expertise                              | 0.971 | 0.007 | 0.004 | −0.032|
| 17. The need to develop decision-making skills                        | 0.955 | −0.006| −0.007| −0.013|
| 19. The need to continue learning to become educated                   | 0.906 | 0.002 | 0.012 | 0.004 |
| 20. The need for registered nurses to wish to continue learning throughout their lives | 0.869 | 0.004 | 0.013 | −0.002|
| 16. The need to keep up with advances in medicine                     | 0.835 | −0.009| −0.006| 0.040 |
| 2. Competent superiors (Cronbach’s α=0.943)                           |       |       |       |       |
| 9. Strong motivation toward self-improvement among supervisors         | 0.006 | 0.947 | −0.043| 0.009 |
| 8. Diligent supervisors                                                | 0.001 | 0.921 | −0.013| −0.032|
| 10. Curiosity among supervisors                                         | −0.014| 0.868 | 0.012 | 0.007 |
| 7. Supervisors placing importance on research                          | −0.047| 0.833 | 0.067 | 0.014 |
| 6. Recognizing the necessity of developing nursing expertise           | 0.059 | 0.763 | 0.053 | 0.010 |
| 3. Competent colleagues (Cronbach’s α=0.912)                           |       |       |       |       |
| 4. Strong motivation toward self-improvement among my colleagues        | 0.048 | −0.035| 0.932 | −0.025|
| 3. Diligent colleagues                                                 | 0.014 | −0.039| 0.893 | −0.022|
| 5. Curiosity among my colleagues                                       | 0.050 | 0.042 | 0.749 | 0.018 |
| 2. Colleagues placing importance on research                           | −0.088| 0.021 | 0.746 | 0.036 |
| 1. Colleagues striving to develop their expertise in nursing            | −0.007| 0.093 | 0.731 | 0.024 |
| 4. Physician expectations of registered nurses (Cronbach’s α=0.903)    |       |       |       |       |
| 12. Physicians’ expectations of registered nurses to play an active role in team medicine | −0.071| −0.014| 0.031 | 0.894 |
| 14. Physicians’ expectations of registered nurses to continue learning | 0.084 | 0.003 | −0.024| 0.824 |
| 13. Physicians’ expectations of registered nurses to report their opinions as nursing experts in conferences | −0.117| −0.054| 0.101 | 0.787 |
| 11. Physicians’ expectations of registered nurses to develop expertise | 0.010 | 0.081 | −0.051| 0.771 |
| 15. Physicians’ expectations of registered nurses to develop decision-making skills | 0.156| −0.003| −0.050| 0.730 |

Inter factor correlations
1. Work environment to continue learning                               | 1     |       |       |       |
2. Competent superiors                                                  | 0.372 | 1     |       |       |
3. Competent colleagues                                                 | 0.212 | 0.568 | 1     |       |
4. Physician expectations of registered nurses                           | 0.429 | 0.487 | 0.421 | 1     |

To conduct factor analysis (the principal factor method and promax rotation), the following system was used. Concerning each item of registered nurses’ perceptions of their work environments, 1 to 7 points were given from definitely disagree to definitely agree. Bold-faced type shows factor loadings ≥0.4. To calculate the Cronbach’s alpha of each factor, 1 to 7 points were given in the order from definitely disagree to definitely agree.

Table 4  Predictors of interest in enrolling in a master’s program of a nursing graduate school

| Variable                                                                 | Pearson’s correlation coefficient | P     | Standardized partial regression coefficient | P     | VIF² |
|--------------------------------------------------------------------------|----------------------------------|-------|---------------------------------------------|-------|------|
| Age                                                                      | −0.003                           | 0.869 | 1.332                                       |       |      |
| Marital status                                                           | −0.006                           | 0.715 | 1.366                                       |       |      |
| Employment status                                                        | 0.036                            | 0.017 | 1.106                                       |       |      |
| Being able to keep up with courses in graduate schools                   | 0.405 <0.001                     | 0.325 | <0.001                                      | 1.175 |      |
| Dedication of graduate school teachers to their students                 | 0.222 <0.001                     | −0.117| <0.001                                      | 1.745 |      |
| Being able to acquire skills to contribute to society                    | 0.410 <0.001                     | 0.390 | <0.001                                      | 1.706 |      |
| Work environment to continue learning                                    | 0.125 <0.001                     | 0.026 | 0.115                                       | 1.377 |      |
| Competent superiors                                                      | 0.090 <0.001                     | −0.052| 0.008                                       | 1.892 |      |
| Competent colleagues                                                     | 0.168 <0.001                     | 0.083 | <0.001                                      | 1.708 |      |
| Physician expectations of registered nurses                              | 0.102 <0.001                     | −0.072| <0.001                                      | 1.654 |      |

To calculate standardized partial regression coefficients and/or Pearson’s correlation coefficients, the following system was used. Concerning interest in enrolling in a master’s program of a nursing graduate school, 1 to 7 points were given in the order from definitely disagree to definitely agree. Respondents’ age was used as a continuous variable. The coding of dichotomous variables were marital status (married=1, single=0) and employment status (full-time worker = 1, part-time worker = 0). Regarding each factor shown in Table 2 and Table 3, the factor scores were calculated and then used for the analyses. ²: VIF, Variance Inflation Factor.
master’s programs. These results are logical when nursing activities are considered in the clinical setting.

Nursing science is a practical study. Registered nurses can learn nursing skills and expertise from their superiors, especially when the superiors are competent. They may not feel any necessity to go to graduate school because they can learn what they are uncertain about and what they wish to learn in the clinical setting.

Further, because registered nurses need to work with physicians, they will realize that their expertise is respected when they are aware of the expectations of the physicians they are working with. These considerations may lower the motivation of registered nurses to strengthen their expertise by making the additional effort to enroll in a graduate school.

Education in graduate schools can provide educational opportunities and knowledge that are difficult to fully acquire in the clinical setting (including advanced thinking skills, the ability to critically read the literature, data analysis skills, and the ability to organize research results). Further, there are many teachers in graduate schools who do not specialize in nursing science and medicine, but rather in statistics and social sciences. Learning from these graduate school teachers can help registered nurses broaden their perspective and enable acquisition of sophisticated thinking abilities that they will not be able to solely obtain through instruction from superior nurses and collaborative work with physicians. Registered nurses who complete a graduate school course may develop new ways of thinking, without being confined by convention. It is necessary for graduate school teachers to inform registered nurses that they offer education that is unique to graduate schools and is helpful.

The registered nurses who felt that their colleagues were competent were significantly more interested in enrolling in master’s programs. Registered nurses are broadening their professional abilities while working diligently together with others in an environment in which their colleagues are competent. In such an environment, registered nurses will be subject to favorable stimuli from their colleagues in their daily work, instilling wishes to improve and develop their professional abilities. It would seem that registered nurses exposed to such environments would become interested in graduate school and in seeking more advanced education. Graduate school teachers do not directly engage in the management of hospitals. However, universities can support the learning activities of registered nurses working in hospitals through extension lectures. Graduate school teachers should contribute to developing competent nurses who wish to further their skills.

Full-time nurses were significantly more interested in enrolling in master’s programs than part-time nurses. In many cases, full-time nurses have been engaged in more responsible tasks than part-time nurses. There may be family circumstances that influence the choice of employment type, but one possible reason that full-time nurses choose full-time employment is that they are attracted to nursing work. Therefore, full-time nurses may feel the necessity to improve their professional abilities more strongly and be more interested in career development than part-time nurses.

The first limitation of this study was that random sampling was not used. Therefore, the generalizability of the results of this study are limited. Additionally, because a cross-sectional design was used, we could not identify causal relations.

One study in the United States focused on so-called “magnet hospitals” that had a high retention rate in terms of nurses. Magnet hospitals offer comprehensive educational support for nurses to receive formal education and acquire academic degrees (e.g., flexible work scheduling, financial support, and leaves of absence). This can be applied to Japan, where there is a shortage of nurses and where such educational support could contribute to raising retention rates by creating workplaces in which nurses experience job satisfaction and any improvements regarding their nursing skills are appreciated. Further studies should investigate the educational support provided by hospitals for nurses and assess its effects.

Conclusions

We investigated the predictors associated with interest in enrolling in the master’s programs of nursing graduate schools. We found that full-time nurses were more interested in enrolling in master’s programs than part-time nurses. Registered nurses who felt that they could keep up with courses in graduate schools, that they would be able to acquire skills to contribute to society, and that their colleagues were competent, showed stronger interest in master’s programs. Registered nurses who felt that their superiors were competent and that they were expected to perform well by physicians also showed lower interest in master’s programs.

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Appendix A: Registered nurses’ impressions regarding the master’s programs of nursing graduate schools (original version in Japanese)

Keeping up with lectures
1. If I enroll in a graduate school, I think I will be able to keep up with the lectures.

Acquiring skills for research
2. If I enroll in a graduate school, I think I will be able to acquire skills for conducting research.

Understanding the textbooks
3. If I enroll in a graduate school, I think I will be able to understand the textbooks used at the school.

Dealing with subjects
4. I think I will be able to deal with the subjects assigned in graduate school lectures.

Earning credits
5. I think I will be able to earn credits by taking lectures at a graduate school that are necessary to graduate.

Not being overbearing toward their students
6. I think graduate school teachers are not generally overbearing toward their students.

Kind instruction
7. I think graduate school teachers generally teach kindly.

Attractive personalities
8. I think graduate school teachers generally have attractive personalities.

Advising students on problems
9. I think graduate school teachers generally provide good advice when students have problems.

Taking time to answer questions on student research
10. I think graduate school teachers generally take time to answer questions on student research.

Developing expertise in nursing
11. I think a graduate school education enables students to develop expertise in nursing.

Thinking based on evidence
12. I think a graduate school education will enable students to consider matters based on the available evidence.

Gaining expertise that cannot be acquired by only working at clinical sites
13. I think a graduate school education will enable students to gain expertise that cannot be acquired by only working at clinical sites.

Enabling logical thinking
14. I think a graduate school education enables students to think logically.

Acquiring broad perspectives
15. I think a graduate school education enables students to acquire broader perspectives.

Contribution to raising the quality of people’s lives
16. I think studying at a graduate school will enable students to contribute to raising the quality of people’s lives.

Contribution to societal development
17. By learning techniques to conduct nursing research at a graduate school, I think students will be able to contribute to the development of society.

Contribution to raising the quality of nursing services
18. By getting an education at a graduate school, I think students will be able to contribute to raising the quality of nursing services provided to patients.

Contribution to improving problems at the nursing work site
19. By getting an education at a graduate school, I think students will be able to contribute to improving problems at the nursing work site.

Expecting registered nurses to gain highly specialized expertise
20. I think society expects registered nurses to gain highly specialized expertise at graduate schools.

Interest in enrolling in a master’s program of a nursing graduate school
21. I am interested in enrolling in a master’s program of a nursing graduate school.
Appendix B: Registered nurses’ perceptions of their work environment (original version in Japanese)

Colleagues striving to develop their expertise in nursing
  1. Many of my colleagues generally strive to develop expertise in nursing.

Colleagues placing importance on research
  2. Many of my colleagues generally place importance on trying to conduct research.

Diligent colleagues
  3. Many of my colleagues are generally diligent.

Strong motivation toward self-improvement among my colleagues
  4. Many of my colleagues are generally strongly motivated to improve themselves.

Curiosity among my colleagues
  5. Many of my colleagues are generally very curious.

Recognizing the necessity of developing nursing expertise
  6. I think my supervisors generally recognize the necessity of developing nursing expertise.

Supervisors placing importance on research
  7. I think my supervisors generally place importance on trying to conduct research.

Diligent supervisors
  8. I think my supervisors are generally diligent.

Strong motivation toward self-improvement among supervisors
  9. I think my supervisors generally place importance on motivation toward self-improvement.

Curiosity among supervisors
 10. I think my supervisors are generally very curious.

Physicians’ expectations of registered nurses to develop expertise
  11. I think physicians generally expect registered nurses to develop expertise.

Physicians’ expectations of registered nurses to play an active role in team medicine
  12. I think physicians generally expect registered nurses to play an active role in promoting team medicine.

Physicians’ expectations of registered nurses to report their opinions as nursing experts in conferences
  13. I think physicians generally expect registered nurses to report their opinions as nursing experts in conferences.

Physicians’ expectations of registered nurses to continue learning
  14. I think physicians generally expect registered nurses to continue learning.

Physicians’ expectations of registered nurses to develop decision-making skills
  15. I think physicians generally expect registered nurses to develop decision-making skills.

The need to keep up with advances in medicine
  16. I feel that registered nurses cannot keep up with advances in medicine unless they continue learning.

The need to develop decision-making skills
  17. I feel that registered nurses should continue learning to be able to develop decision-making skills.

The need to develop nursing expertise
  18. I feel it is necessary for registered nurses to continue learning to be able to develop their nursing expertise.

The need to continue learning to become educated
  19. I feel it is necessary for registered nurses to continue learning to further their education.

The need for registered nurses to wish to continue learning throughout their lives
  20. I feel it is necessary for registered nurses to wish to continue learning throughout their lives.