Health & Research Journal

Vol 9, No 1 (2023)

Volume 9 Issue 1 January - March 2023

Effect on the nursing students' academic achievements, motivation, and learning strategies of role-playing intervention used in school health nursing course

Zuhal Emlek Sert, Sevcan Topçu, Ayla Bayık Temel

doi: 10.12681/healthresj.30343

HEALTH AND RESEARCH JOURNAL
E-ISSN:2459-3192

(2023), Volume 9, Issue 1

RESEARCH ARTICLE

EFFECT ON THE NURSING STUDENTS' ACADEMIC ACHIEVEMENTS, MOTIVATION, AND LEARNING STRATEGIES OF ROLE-PLAYING INTERVENTION USED IN SCHOOL HEALTH NURSING COURSE

Zuhal Emlek Sert[1], Sevcan Topçu[2], Ayla Bayık Temel[3]

1. Lecturer, RN, PhD, Faculty of Nursing, Public Health Nursing Department, Ege University, Izmir, Turkey
2. Assistant Professor, RN, PhD, Faculty of Nursing, Public Health Nursing Department, Ege University, Izmir, Turkey
3. Professor, RN, PhD, Faculty of Nursing, Cyprus Health and Social Sciences University, Turkish Republic of Northern Cyprus

Abstract

Background: Clinical practice areas are more limited, especially in sub-specialties such as school and occupational health. Different training techniques such as role-playing and simulation enable an opportunity to solve these problems.

Aim: This study aimed to evaluate the effect of role-playing related to school-health screenings on nursing students' academic achievement, motivation, and learning strategies.

Method and Material: A quasi-experimental study was performed with experimental and control groups. Data were collected from 56 nursing students as data collection tools were used Motivated Strategies for Learning Questionnaire and Grade Point Average.

Results: After the role-playing, the grade point average scores of the students in the experimental group were significantly higher than those in the control group. Nursing students in the experimental group had a significantly higher mean score in intrinsic goal orientation, control of learning beliefs, organization, critical thinking, peer learning, and metacognitive self-regulation at the post-test compared to the control group.

Conclusions: The results of this study demonstrated that the role-playing intervention changed the learning strategies used by nursing students. Also, it increased the use of metacognitive strategies, organizing, explaining, and critical thinking while boosting collaborative learning strategies such as peer collaboration and help-seeking.

Keywords: Nurse education, role-playing, motivation, learning strategies.

Corresponding Author: Sevcan Topçu**,** PhD, RN, Asst.Prof., Ege University, Faculty of Nursing. Public Health Nursing Department, Izmir, TURKEY.. E-mail: sevcan.topcu@hotmail.com

Cite as: Emlek Sert, Z., Topçu, S., Ayla Bayık Temel, A. (2023). Effect on the nursing students' academic achievements, motivation and learning strategies of role-playing intervention used in school health nursing course. Health and Research Journal,9(1),35-45. https://ejournals.epublishing.ekt.gr/index.php/HealthResJ

INTRODUCTION

The National Association of School Nurses (NASN) defines school health nursing as a particular field of nursing practice that protects and improves students' health, provides an opportunity for optimal development, and increases academic achievement.[1] School health nurses are defined based on ethical and evidence-based practices as leaders who set a bridge between health services and education, coordinate care, advocate for the quality of student-centered care, and collaborate to design systems that enable individuals and communities to develop their full potential.[1] Nurse is responsible for the schoolchildren's health, and therefore they must be prepared as adequate and competent professionals before graduating from nursing education programs.[2]

The limited number of adequate and qualified clinical areas in nursing practical training has a negative effect on students' learning experiences.[3-4] Practical training fields are more limited, especially in sub-specialties of nursing such as school health nursing. This situation leads nursing students to not adequately gain professional competencies, skills, and experience in clinical settings. Active learning strategies such as role-playing, simulation, etc., lead to solving these problems.[5]

Although traditional learning methods such as lectures and seminars are widely used in nursing education, active learning strategies such as problem-based learning, role-playing, and simulation are quite limited.[6] Role-playing provides students actively participate in the learning process by doing and experiencing.[7] Several studies showed that role-playing reduces students' anxiety, enables better observation and analysis of interpersonal interactions, and increases problem-solving, decision-making, interpretation, and critical thinking skills in different situations.[8-9]

Self-regulatory learning; is an effective and constructive process in which the learner sets goals for his/her own learning, monitors, and organizes while trying to control his/her cognition, motivation, and behavior under the guidance of his/her objectives.[10-11] Self-regulatory learning is also a process where the learner is motivationally, behaviorally, and meta-cognitively proactive; it expresses students' resource choice, self-assessment, learning needs, and goal-setting skills.[11-12] Self-regulatory learning focuses on motivational processes and beliefs that can be expressed as a whole of one's behaviors and expectations.[11,13] Lack of motivation is one of the most important obstacles to the success and performance of the learner.[14] Several studies showed that there was a relationship between motivation and learning strategies with academic achievement,[15-17] also self-regulatory learning was effective in academic achievement and clinical skills.[12] However, there is no study that evaluates the effect of role-playing on the motivation and learning strategies among nursing students. Therefore, the aim of this study is to evaluate the effect of role-playing on the motivation and learning strategies of nursing students.

METHODOLOGY

Study population

In the study, a quasi-experimental design with a pre and post-test control group was used. The 3rd year bachelor's nursing students (n=56) who taken in the School Health Nursing Course (SHNC) were included in this study. Inclusion criteria were (1) willing to participate in this study, and (2) not taken the course before. This study was carried out with 54 students who meet the study inclusion criteria. Two students who retake this course were excluded from this study.

Students were randomly assigned to the experimental (27 students) and control groups (27 students) by the random number table. There were no statistically significant differences between the participants in the experimental and control groups in terms of their sociodemographic characteristics (Table 1, $p>0.05$). A power analysis was performed using the G-Power software program using the following parameters: α:0.05, effect size:0.71, sample 27. The β was determined as 0.83.

Data collection

This study was conducted between September 2018 and January 2019 in a Faculty of Nursing in Turkey. As data collection tools were used "The Sociodemographic Characteristics Questionnaire", "Motivated Strategies for Learning Questionnaire (MSLQ)" and Grade Point Average (GPA) for SHNC. Socio-Demographic Characteristics Questionnaire consists of ques-

tions including age, and gender.

Motivated strategies for learning questionnaire (MSLQ) which is based on social cognitive learning theory measures Self-Regulated Learning.[18] This tool which was developed by Pintrich, Smith, Garcia, and McKeachie consists of two scales Motivational Scales (MS) and the Learning Strategies Scales (LSS). MS comprises 31 items and six subscales as intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance, and test anxiety. LSS comprise 50 item and nine subscales as rehearsal, elaboration, organization, peer learning, critical thinking, metacognitive self-regulation, time and study environment, effort regulation, and help-seeking.[18] Cronbach's alpha values ranged from 0.80 and 0.68 for MS, 0.80 and 0.52 for LSS. The validity and reliability studies of the Turkish version of the scale were conducted by Büyüköztürk, Akgün, Özkahveci and Demirel (2004). In this study, MS Cronbach' alpha values were 0.48 for intrinsic goal orientation, 0.59 for extrinsic goal orientation, 0.84 for task value, 0.64 for control of learning beliefs, 0.88 for self-efficacy 0.5 for learning and performance and 0.50 for test anxiety. LSS Cronbach' alpha values were 0.62 for rehearsal, 0.80 for elaboration, 0.68 for organization, 0.58 for peer learning, 0.74 for critical thinking, 0.79 for metacognitive self-regulation, 0.66 for time and study environment, 0.60 for effort regulation and 0.41 for help-seeking.[13]

Grade point average (GPA) *is* the grade point average of the nursing students for SHNC at the end of the semester.

Intervention

SHNC takes place in the 5th semester in the curriculum of the nursing faculty. School Health Screening consists of visual screening, scoliosis screening, and measuring height, weight is one of the lessons in the SHNC. This lesson was preferred for role-playing because it is quite essential in the prevention of schoolchildren's common health issues in Turkey. Before the school health screening lesson, MSLQ was applied to all students (Figure 1). The school health screening lesson was lectured theoretically (three-course hours) and got experimental and control groups watched a video presentation (three-course hours) about it. The content of the videos included how to measure the height and weight of the school children and how to perform visual and scoliosis screening and the procedural steps. One week later, the experimental group performed role-playing for school health screening in the classroom during the one-course hours. Meanwhile, the control group was provided with free working time.

Before the role-playing, checklists are prepared related to school health screenings and were handed out to the students so that they could figure out the truth and false that was made during the role-playing and discuss the role-playing. At the end of each role-playing performance, 15-20 minutes were reserved for discussion. Scenarios were one scenario for each screening (height-weight screening, vision screening, and scoliosis screening) developed by researchers (Table 2). In all of the scenarios, one student acted as a school health nurse and other students as schoolchildren. Necessary materials such as scale, tape measure, percentile table, Snellen chart, color blindness book, light, and recording form were supplied for each scenario by researchers before role-playing. One month later after role-playing, MSLQ was again applied to all students. At the end of the semester, all students' grade point average obtained from SHNC was calculated.

Data analysis

Data analysis was performed using SPSS for Windows, version 20. As all of the continuous variables collected were not normally distributed, non-parametric tests were used to assess for differences between experimental and control groups. χ^2 test was used to assess the homogeneity between the sociodemographic characteristics of the two groups. Mann-Whitney U test was used to compare MSLQ subscale scores at pretest and posttest of experimental and control groups, the Mann-Whitney U test was used to compare GPA scores of experimental and control groups, and the Wilcoxon test was applied between the control group's pretest and posttest MSLQ subscale scores, and between the experimental group's pretest and posttest MSLQ subscale scores. A p-value of <0.05 was considered significant.

Ethical considerations

In order to carry out the study, permission was obtained from Institutional Review Board (Approval Number: 183-2018). Written informed consent was obtained from the students who

agreed to participate in the study.

RESULTS

The mean age of nursing students in experimental and control groups is 20.81±1.27, and 20.88±1.88, respectively. There was no statistically significant difference between the socio-demographic characteristics of the students in the experimental and control groups (Table 1, p>0.05).

When the SHNC GPA of the students in the experimental (83.37±7.64) and control groups (76.85±10.42) were compared, it was found that the GPA of the students in the experimental group were significantly higher than the students in the control group (U=233.50; p=0.02).

MS subscales mean of students in experimental and control groups are shown in Table 3. There are no significant differences in MS pre-test subscale means between experimental and control groups. After the role-playing, nursing students in the experimental group had a significantly higher mean in intrinsic goal orientation and control of learning beliefs at the post-test compared to control groups (p≤0.05).

When the pre-test and post-test subscale mean of the students in the experimental group were compared, a statistically significant difference was found (p≤0.05). Nursing students in the experimental group had a significantly higher mean in intrinsic goal orientation, task value, control of learning beliefs, and self-efficacy for learning and performance at the post-test compared to the pre-test (p≤0.05). There was no significant difference in the pre-test and post-test mean of the control group (p ≥0.05).

DISCUSSION

This study evaluated the effect of role-playing on the motivation and learning strategies of nursing students. In several studies conducted with nursing students on different learning topics, role-playing was found to be effective in the development of counseling, communication, and screening skills.[19-21] In a study by Wheeler & McNelis (2014), role-playing was conducted with nursing students about home visiting.[5] It was found that role-playing provided a safe and standard environment for public health nursing practices, where instructors and the school have less control over student behaviors and situations, and its use was helpful.[5] Pourghaznein, Sabeghi & Shariatinejad (2015) compared the effectiveness of role-playing, web-based learning, and traditional learning in the Surgical Nursing Course. It was stated that role-playing and web-based learning have provided more permanent learning and should be used in the teaching of important nursing subjects.[22] Vizeshfar, Dehghanrad, Magharei, & Sobhani (2016) compared the role-playing and traditional learning in nursing education and found that exam scores of the role-playing group were significantly higher than in the traditional learning group.[23] In this study, similar results to other studies were obtained, the GPA was found higher in the experimental group than in the control group (p<0.05). These results showed that role-playing was effective in academic achievement.

In a study by Salamonson, Everett, Koch, Wilson, Patricia & Davidson (2009), where motivation and learning strategies of nursing and medical students were compared, it was found that the mean of extrinsic goal orientation of nursing students was 5.6±1.1.[24] A study conducted with second-grade nursing students by Gün (2018) found that nursing students motivated mostly by intrinsic goal orientation followed by task value, control of learning beliefs, self-efficacy for learning and performance, extrinsic goal orientation, test anxiety.[25] The present study showed that nursing students in both experimental and control groups were motivated by test anxiety, control of learning beliefs, extrinsic goal orientation, task value, intrinsic goal orientation, self-efficacy for learning, and performance respectively at the pre-test. After the role-playing, intrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning, and performance subscales mean of nursing students in the experimental group significantly increased. Besides, when the MS subscale means of the experimental and control groups at the post-test were compared, it was found that role-playing had a significant effect on the intrinsic goal orientation, and control of learning beliefs. While intrinsic goal orientation focuses on learning and competence; extrinsic goal orientation focuses on grades and the approval of others.[18] Extrinsic goal orientation is the situation where the learner is not concerned with direct participation in the task, but rather with grades,

awards, and reputation.[12] In order for extrinsic goal orientation can be transformed into intrinsic goal orientation, students should be interested in the tasks as well as requirements such as competence, autonomy, and relevancy.[12] In this study, nursing students with extrinsic motivation such as exam and GPA anxiety were changed motivation resources with role-playing. Control of learning beliefs is a belief that results depend on one's effort or competence rather than on external factors.[26] In this study, it is thought that the role-playing where nursing students in the experimental group actively participate in learning with their efforts through role-playing causes a significant increase in the control of learning beliefs of nursing students. Task value defines how important and valuable is the course content for the student;[18] but the self-efficacy for learning and performance includes one's self-confidence that the competencies are sufficient to succeed.[26] The results of our study suggest that role-playing has a positive effect on the motivation to learnings of nursing students according to their efforts, competencies, and goals without expecting awards or grades.

Learning strategies, expressed as techniques that facilitate self-learning, enable the learner to learn easily and permanently, increase the efficiency of learning and provide the learner with the ability to learn independently.[13] The study by Robb (2016) evaluated students' use of motivation and learning strategies in the course of nursing theories and found that nursing students frequently used rehearsal as a learning strategy.[27] In a study conducted by Salamonson et al., (2009), it was stated that nursing students had significantly lower mean at peer learning, help-seeking, critical thinking, time, and study environment management subscales compared to medical students. Also, it was reported that nursing students failed to see peer learning as a way of learning as a reflection of the traditional learning system.[24] In the study by Gün (2018) was found that second-grade nursing students most often used organization, followed by rehearsal, critical thinking, metacognitive self-regulation, time and study environment management, effort regulation, help-seeking, peer learning, and elaboration, respectively.[25] However, the results of our study showed that in the pre-test, the nursing students in both experimental and control groups used the rehearsal strategy, which defines learning by making mental repetitions and memorization. After the role-playing, it was found that the nursing students in the experimental group had higher utilization of learning strategies which were organization, critical thinking, peer learning, and metacognitive self-regulation compared to the control group. These results suggested that nursing students preferred metacognitive strategies rather than memorization-based learning. They used learning strategies such as collaborative learning, establishing connections between information, problem-solving, critical thinking, and decision making.

Study limitations

One of the most important limitations of this study is the low number of students in the experimental and control groups. Another limitation is that because the SHN course is an elective one, the majority of students had chosen this course voluntarily. In addition, a small number of male students in this study is another limitation. Although MySQL's validity and reliability study was carried out, because the Cronbach α coefficient of the help-seeking subscale is 0.41 and the Cronbach α-coefficient of the intrinsic goal orientation subscale is 0.48, results related to these subscales should be carefully evaluated. Another limitation is that the results can only be generalized to this group. Therefore, the effectiveness of role-playing can be assessed in larger sample groups.

CONCLUSION

Consequently, role-playing in school health screenings was an effective strategy for nursing students, and it increased their academic achievement. It was shown that role-playing positively affected the nursing students' motivation and learning strategies in this study. Role-playing was impressive in motivating nursing students to the intrinsic goal orientation rather than extrinsic goal orientation and in increasing the control of learning beliefs, which states that the outcome depends on their performance and belief rather than external factors. Also, role-playing changed the learning strategies used by nursing students. It increased the use of metacognitive strategies, organizing, explaining, critical thinking, and collaborative learning strategies such as peer collaboration and seeking help.

In order to develop motivation and learning strategies for nursing students learning methods such as role-playing and simulation where students are within the center of learning should be preferred. The use of role-playing in nursing education will be beneficial for both instructors and students in the face of the gradual restriction of practical training areas in nursing education. It is thought that role-playing in the fields such as public health nursing, school health nursing, occupational health nursing, and home care nursing, where control over students and practice conditions is lesser, will affect students' learning.

Funding

The authors were not receipt of the financial support for the research, authorship, and/or publication of this article.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Institutional Review Board

The study was approved by the Ege University Institutional Review Board (Approval Number:183-2018)

Author Contributions

Z.E. Sert contributed to conception, design, acquisition, analysis, and interpretation; drafted the manuscript; critically revised the manuscript; gave final approval; and agreed to be accountable for all aspects of work ensuring integrity and accuracy. S. Topçu contributed to conception, design, interpretation; drafted the manuscript; critically revised the manuscript; gave final approval; and agreed to be accountable for all aspects of work ensuring integrity and accuracy. A.B. Temel contributed to conception, design; acquisition, analysis, and interpretation; gave final approval; and agreed to be accountable for all aspects of work ensuring integrity and accuracy.

REFERENCES

1. National Association of School Nurses. NASN Board of Directors. 2017 https://www.nasn.org/about-nasn/about
2. Cogan, R. M., Conway, S. M., & Atkins, J. D. Redesigning school nursing education in New Jersey to address the challenges and opportunities of population health. NASN School Nurse, 2017; 32(2), 83-86.
3. Bosse, H. M., Schultz, J. H., Nickel, M., Lutz, T., Möltner, A., Jünger, J., ... & Nikendei, C. The effect of using standardized patients or peer role play on ratings of under graduate communication training: a randomized controlled trial. Patient education and counseling, 2012; 87(3), 300-306. https://doi.org/10.1016/j.pec.2011.10.007
4. Delnavaz, S., Hassankhani, H., Roshangar, F., Dadashzadeh, A., Sarbakhsh, P., Ghafourifard, M., & Fathiazar, E. Comparison of scenario based triage education by lecture and role playing on knowledge and practice of nursing students. Nurse education today, 2018; 70, 54-59.
5. Wheeler, C. A., & McNelis, A. M. Nursing student perceptions of a community-based home visit experienced by a role-play simulation. Nursing Education Perspectives, 2014; 35(4), 259-261. https://doi.org/10.5480/12-932.1
6. Hasanpour-Dehkordi, A., & Solati, K. The efficacy of three learning methods collaborative, context-based learning and traditional, on learning, attitude and behaviour of undergraduate nursing students: integrating theory and practice. Journal of clinical and diagnostic research, 2016; 10(4), VC01.
7. Özden Y. Learning and Teaching. 12th edition. Pegem Akademi, 2014; Ankara. Turkey
8. Dawood E. Nursing Students' Perspective about Role–Play as a Teaching Strategy in Psychiatric Nursing. Journal of Education and Practice. 2013; Vol.4, No.4, 38-42.
9. McNamara, N. Preparing students for clinical placements: The student's perspective. Nurse Education in Practice, 2015; 15(3), 196-202. https://doi.org/10.1016/j.nepr.2014.11.011
10. O'Shea E. Self-directed learning in nursing education: a review of the literature. J Adv Nurs 2003; Jul; 43(1):62-70. http://dx.doi. org/10.1046/j.1365-2648.2003.02673.x
11. Zimmerman, B. J. Self-regulation involves more than metacognition: A social cognitive perspective. Educational psychologist, 1995; 30(4), 217-221. https://doi.org/10.1207/s15326985ep3004_8

12. Cho, K. K., Marjadi, B., Langendyk, V., & Hu, W. Medical student changes in self-regulated learning during the transition to the clinical environment. BMC medical education, 2017; 17(1), 59. https://doi.org/10.1186/s12909-017-0902-7
13. Büyüköztürk, Ş., Akgün, Ö. E., Kahveci, Ö., & Demirel, F. The validity and reliability study of the Turkish form of motivation and learning strategies scale. Educational Sciences: Theory & Practice, 2004; 4(2), 207-239.
14. Hamid, S.,& Singaram, V. S. Motivated strategies for learning and their association with academic performance of a diverse group of 1st-year medical students. African Journal of Health Professions Education, 2016; 8(1), 104-107.
15. Pizzimenti MA, Axelson RD. Assessing student engagement and selfregulated learning in a medical gross anatomy course. Anat Sci Educ. 2015; 8(2):104–10. https://doi.org/10.1002/ase.1463
16. Stegers-Jager KM, Cohen-Schotanus J, Themmen AP. Motivation, learning strategies, participation and medical school performance. Med Educ. 2012; 46(7):678–88. https://doi.org/10.1111/j.1365-2923.2012.04284.x
17. Turan S, Konan A. Self-regulated learning strategies used in surgical clerkship and the relationship with clinical achievement. J Surg Educ. 2012; 69(2):218–25. https://doi.org/ 10.1016/j.jsurg.2011.09.003
18. Pintrich, P. R., Garcia, T., Smith, D. A, Garcia T & McKeachie, W. J. Reliability and Predictive Validity of the Motivated Strategies for Learning Questionnaire. Educational and Psychological Measurement, 1993; 53. 801-813. https://doi.org/ 10.1177/0013164493053003024
19. Fulton, A. E., Dimitropoulos, G., Ayala, J., McLaughlin, A. M., Baynton, M., Blaug, C., ... & Ragan, E. Role-Playing: A Strategy for Practicum Preparation for Foundation Year MSW Students. Journal of Teaching in Social Work, 2019; 39(2), 163-180.
20. Khatiban, M., Sangestani, G., Bennett, N., & Oshvandi, K. Role-playing versus Conventional Strategy in Midwifery Clinical Education on Breast Self-examination: A Quasi-Experimental Study. Journal of Clinical & Diagnostic Research, 2017; 11(12).
21. Larti, N., Ashouri, E., & Aarabi, A. The effects of an empathy role-playing program for operating room nursing students in Iran. Journal of Educational Evaluation for Health Professions, 2018; 15.
22. Pourghaznein, T.,Sabeghi, H., & Shariatinejad, K. Effects of e-learning, lectures, and role playing on nursing students' knowledge acquisition, retention and satisfaction. Medical journal of the Islamic Republic of Iran, 2015; 29, 162.
23. Vizeshfar, F.,Dehghangrad, F., Magharei, M., Sobhoni, S. Effects of Applying Role Playing Approach on Nursing Students Education. International Journal of Humanities and Culturel Studies. 2016; 1772-1781.
24. Salamonson, Y.,Everett, B., Koch, J., Wilson, I., &Davidson, P. M. Learning strategies of first year nursing and medical students: A comparative study. International Journal of Nursing Studies, 2009; 46(12), 1541-1547. https://doi.org/10.1016/j.ijnurstu.2009.05.010
25. Gün T. Motivation and Learning Strategies of Nursing Students. Aydın Adnan Menderes University, Health Sciences Institute, Master Thesis. 2018. Aydın.
26. Dayel, S. B., Al Diab, A., Abdelaziz, A., Farghaly, A., & Al Ansari, A. Validity of the motivated strategies for learning questionnaire in Saudi Arabia. International journal of medical education, 2018; 9, 309. https://doi.org/10.5116/ijme.5bec.81cf.
27. Robb, M. K. Self-regulated learning: Examining the baccalaureate millennial nursing student's approach. Nursing education perspectives, 2016; 37(3), 162-164. https://doi.org/ 10.5480/14-1349

ANNEX

Figure 1. Workflow Diagram.

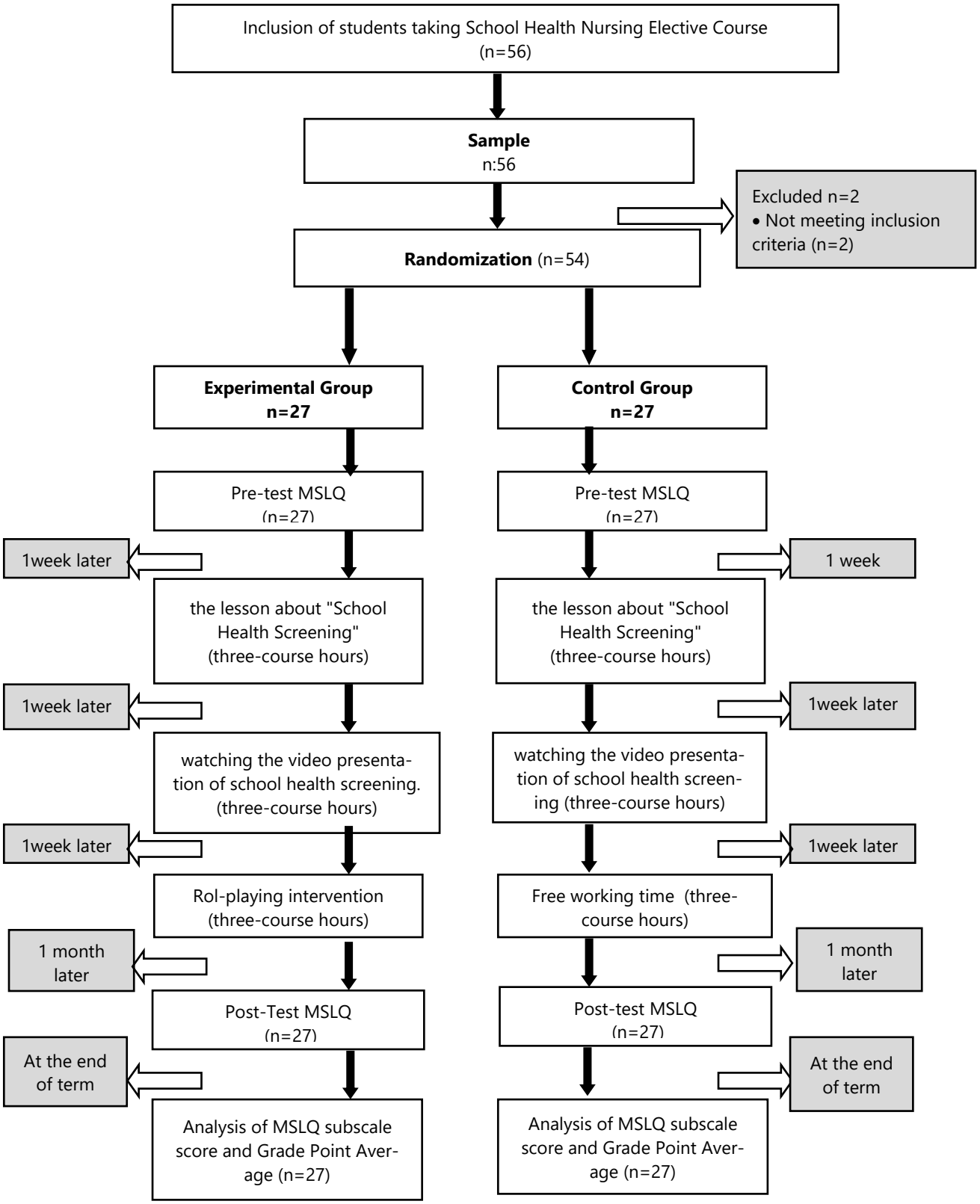

Table 1. Socio-demographic Characteristics of the Students in the Experimental and Control Groups.

Variables	Experimental Group (n=27)	Control Group (n=27)	U/x^2	p
Age (x±SD)	20.81±1.27	20.88±1.78	336.5[a]	0.59
Gender (%)				
Female	20 74.1	22 81.5	0.11[b]	0.74
Male	7 25.9	5 18.5		
Voluntary selection of school health nursing elective course (%)				
Yes	20 74.1	19 70.4	0.00[b]	1.00
No	7 25.9	8 29.6		

[a] Mann-Whitney U
[b]Yates' chi-square

Table 2. Scenarios for School Health Screenings.

Scenarios	Description
Height-weight screening scenario	A 28-year-old school health nurse carried out primary school children (four children) height-weight screening in the classroom. Children asked questions to the nurse about measurements.
Vision screening scenario	Primary school children who have normal (two children) and defects of vision (two children) were screened for vision in the School Health Clinic by a 30-year-old school nurse.
Scoliosis screening scenario	A secondary school child who has a right-side curvature of the spine (Thoracic Curve) was screened for scoliosis in the School Health Clinic by the nurse.

Table 3. Comparison of Mean Scores Obtained From Motivation Scale by the Students in the Experimental and Control Groups.

	Experimental Group (N=27) x±Sd	Control Group (N=27) x±Sd	U[a]	p
Intrinsic Goal Orientation				
Pre-test	4.28±0.93	4.17±0.93	346.00	0.75
Post-test	5.01±1.03	3.95±0.93	163.00	**0.00**
Z[b]	-3.75	-1.02		
p	**0.00**	0.31		
Extrinsic Goal Orientation				
Pre-test	4.36±1.22	4.37±1.11	360.50	0.94
Post-test	4.42±0.75	4.21±1.37	280.50	0.14
Z[b]	-0.34	-0.29		
p	0.73	0.76		
Task Value				
Pre-test	4.35±1.18	4.24±0.99	339.50	0.67
Post-test	4.90±1.08	4.38±1.03	258.00	0.06
Z[b]	-2.75	-0.51		
p	**0.01**	0.61		
Control of Learning Beliefs				
Pre-test	4.53±0.95	4.42±0.97	325.5	0.49
Post-test	4.87±0.44	4.51±0.65	243.5	**0.03**
Z[b]	-2.01	-0.36		
p	**0.04**	0.71		
Self-Efficacy for Learning and Performance				
Pre-test	3.84±1.05	3.93±1.09	347.00	0.76
Post-test	4.65±0.92	4.18±1.16	283.50	0.16
Z[b]	-3.80	-1.34		
p	**0.00**	0.18		
Test Anxiety				
Pre-test	4.83±0.92	4.82±0.92	339.00	0.66
Post-test	4.53±1.13	4.86±1.28	296.50	0.24
Z[b]	-1.61	-0.40		
p	0.11	0.69		

[a]Mann-Whitney U test.
[b]Wilcoxon test.

Table 4. Comparison of Mean Scores Obtained From Learning Strategy Scale by the Students in the Experimental and Control Groups.

	Intervention Group (N=27) x±Sd	Control Group (N=27) x±Sd	U[a]	p
Rehearsal				
Pre-test	4.35±1.33	4.30±0.52	349.50	0.79
Post-test	4.45±0.95	4.32±1.40	333.5	0.59
Z[b]	-0.65	-0.27		
p	0.51	0.78		
Organization				
Pre-test	4.07±1.25	4.13±0.92	351.00	0.81
Post-test	4.87±0.85	4.27±1.06	220.50	**0.01**
Z[b]	-3.02	-0.77		
p	**0.00**	0.44		
Elaboration				
Pre-test	4.11±0.98	4.08±1.02	360.50	0.94
Post-test	4.60±1.26	4.06±1.30	267.50	0.09
Z[b]	-2.51	-0.60		
p	**0.01**	0.55		
Critical Thinking				
Pre-test	4.08±1.13	4.09±0.74	359.50	0.93
Post-test	4.65±0.79	4.14±0.90	249.5	**0.04**
Z[b]	-2.53	-0.29		
p	**0.01**	0.77		
Help-Seeking				
Pre-test	4.18±0.93	4.07±1.01	350.50	0.81
Post-test	4.35±0.77	4.17±0.80	323.00	0.47
Z[b]	-0.94	-0.95		
p	0.34	0.34		
Peer Learning				
Pre-test	3.50±0.71	3.41±1.01	331.50	0.56
Post-test	4.27±1.15	3.55±0.94	215.50	**0.01**
Z[b]	-2.72	-0.75		
p	**0.01**	0.45		
Metacognitive Self Regulation				
Pre-test	4.02±0.71	3.97±0.85	354.50	0.86
Post-test	4.55±0.70	4.03±1.03	233.50	**0.02**
Z[b]	-3.70	-0.21		
p	**0.00**	0.83		
Effort Regulation				
Pre-test	4.24±0.82	4.19±0.62	348.00	0.77
Post-test	4.29±0.56	4.24±0.75	359.50	0.93
Z[b]	-0.73	-0.54		
p	0.46	0.58		
Time and Study Environment Management				
Pre-test	4.11±0.78	4.12±0.92	362.00	0.96
Post-test	4.36±0.45	4.22±0.88	322.00	0.46
Z[b]	-1.81	-1.24		
p	0.07	0.21		

[a]Mann-Whitney U test.
[b]Wilcoxon test.