

RESEARCH ARTICLE

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## Investigation of Postgraduate Theses on Using of Web-Based Education in Nursing Education

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### Abstract

**Objective:** This study was conducted to examine the master's and doctoral dissertations investigating the effects of web-based education in the courses conducted in the nursing undergraduate programs of universities in Turkey.

**Methods:** In this study, the database of the Council of Higher Education (CoHE) National Thesis Center was searched using the keywords "nursing and web" regardless of the year interval. As a result of the screening, 16 postgraduate theses meeting the inclusion criteria were included in the study.

**Results:** It was determined that the first thesis was published in 2007, and the number of theses increased in 2017 and 2019. It was determined that 37.2% of the theses were at the master's level, 62.5% at the doctoral level and 93.75% of them were experimental/semi-experimental research designs. It was determined that 50% of the theses were published in the field of nursing principles. It has been found that the use of web-based teaching methods in the education of nursing students positively affects students' gaining knowledge and skills.

**Conclusion:** Although there has been an increase in the number of theses using web-based education in nursing education in recent years, it is recommended that more randomized controlled studies be conducted and that the use of face-to-face education should be supported with web-based education.

**Keywords:** Education, nursing, graduate, student, technology, thesis, web.

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## INTRODUCTION

Nursing education in our country has been continuing its development and change with undergraduate education since 1955 and postgraduate education since 1968 (1). Nursing education requires the use of an education system based on theoretical knowledge and clinical practice, supporting students' cognitive, sensory and psychomotor skills. For this reason, it aims to gain and develop clinical skills and theoretical knowledge in nursing education. Clinical practice training enables the student to integrate theoretical knowledge and practice in healthcare settings and to learn by experience. During the clinical practice education process, the student develops skills in subjects such as professional competence, professionalism, teamwork, communication, critical thinking, and critical decision-making (2).

Nursing education is affected by technological changes in the world, new-generation student profiles, and orientation differences (1). Today, graduates of nursing departments of universities are expected to have many technological competencies. The use of technologies, including computers, phones and tablets, digital communication, professional documents, data processing, and computer software necessary to create multimedia presentations, is in the field of duty of nurses today (3). There are many problems in the nursing education process in our country, such

as the excess number of students, the inadequacy of the number of teaching staff per student, the lack of classrooms and equipment, and the inadequacy of laboratory facilities (4). To develop solutions to these problems, different education systems have been started to be used in nursing education by making use of the developments in the field of instructional technologies (2).

One of the most important technologies used in education is web-based education (5). Web-based education is learning supported by multimedia applications such as text, motion pictures, graphics, sound, animation, and video, where educator-student-lesson interaction is ensured by using computer networks, individuals in the same or different environments are connected to each other by computer networks and share information and documents environments (6). Web-based education meets the educational needs of individuals whose ages, education levels, working conditions, interests, and abilities are very different and who have educational disabilities due to geographical conditions. In addition, since this education is based on self-learning, it supports the development of decision-making and problem-solving skills of individuals, who leave the responsibility of learning to the individual (5). However, the lack of physical interaction with the instructor, the inability to receive immediate feedback from

the teacher, the lack of motivation, and social isolation are important disadvantages (7).

The basic competencies of nursing students are cognitive (knowledge), affective (attitudes and behaviors), and psychomotor (skills) learning areas (8). Studies have reported positive effects of web-based education on cognitive (9-11) and psychomotor learning in nursing education (12-14). Problem-based learning sessions can be carried out on cases by using technological methods in nursing education. It is also used to develop skills such as critical thinking and clinical decision-making. Such applications allow the student to repeat as much as they want, help them learn the skill permanently, and enable them to see the result of their action thanks to computer software (3).

There are many new applications for web-based education such as virtual reality technology, virtual classrooms, integrated E-learning systems, distance mobile education, three-dimensional virtual campus application, distance education with Internet Protocol Television (IPTV) technology, and cloud computing Technologies (15). CliniSpace, Digital Clinical Experience, vSim for Nursing are among the web-based systems used in nursing training (3). In the design of web-based educational environments, knowing the student's learning styles and ensuring the consistency of the environments with their learning styles are important in terms of

ensuring the permanence of learning and increasing academic success (5).

In our country, no study has been found in which postgraduate theses are made by using web-based education approaches in nursing programs that provide education at the undergraduate level. This study was conducted to examine the postgraduate theses made using web-based education in undergraduate nursing programs in Turkey.

## METHODS

This study was conducted as a retrospective descriptive study. In the research, postgraduate theses made without year intervals were scanned using the National Thesis Center database of the CoHE. The keywords "nursing and web" were used while scanning. As a result of the scanning, 121 doctorate and master's theses made between 2007-2022 were reached. As a result of examining the theses in chronological order, 94 theses that were made in the field of nursing but whose participants were not nursing undergraduate program students and 11 theses that were not from the field of nursing were excluded from the study. Then, in the Nursing Departments/Programs, a total of 16 theses, including master's and doctoral theses, related to web-based education applied to nursing undergraduate program students, were included in the scope of the study.

The data were summarized in a form developed by the researchers as the author of

the thesis, publication year, study type, purpose, sample size, and results. The literature review was carried out between August and September 2022.

The inclusion criteria for the study are;

- Access in full text,
- In the field of nursing, it has been done to nursing students,
- Using web-based-supported education as a method.

### Data Analysis

Analysis of data was used descriptive statistics including frequency and percentage.

## RESULTS

16 postgraduate theses that met the inclusion criteria were included in this study. It was determined that there were a total of 1,412 participants in the theses included in the research, 6 of them were master's theses and 10 of them were doctoral theses (Table 1).

**Table 1.** Distribution of thesis types (n=16)

Thesis Type	n	%
Master's thesis	6	37.5
Doctoral thesis	10	62.5

It was determined that the first thesis on web-based education was published in 2007, and the most published years were 2017 (n=4) and 2019 (n=4), (Table 2).

It was determined that the theses were descriptive and methodological (n=1), experimental/semi-experimental (n=15) according to the research method (Table 3).

**Table 2.** Distribution of Theses According to Publication Years (n=16)

Publication Year	n	%
2007	1	6.25
2011	1	6.25
2013	2	12.5
2017	4	25.0
2018	1	6.25
2019	4	25.0
2021	1	6.25
2022	2	12.5

**Table 3.** Distribution of Theses according to Research Method (n=16)

Research Method	n	%
Descriptive and methodological	1	6.25
Experimental/Semi-experimental	15	93.75

When the departments/programs in which the theses were made were examined, it was determined that half of the theses (n=8) were made in the nursing principles department (Table 4).

**Table 4.** Distribution of Theses by Department/Program(n=16)

Department/Program	n	%
Nursing Education	1	6.25
Fundamentals of Nursing	8	50.00
Pediatric Nursing	4	25.00
Surgical Nursing	2	12.50
Obstetric and Women's Diseases		6.25
Nursing	1	

The author, publication year, purpose, type, sample size and results of the theses included in the study are given in Table 5.

When the results of the theses are examined; The aim of the descriptive and methodological study conducted with the participation of 167 students was the preparation/development and implementation of the "Patient Education" course in nursing education in line with the

"Mixed Design Model" with the web-based distance education method and its evaluation in line with the student's opinions. In the study, students' opinions about the patient education course prepared with the web-based method were generally positive. It was found that the difference between the students' self-study habit and their total point average from the Information Form II was highly significant and this difference was in favor of the students who could study by themselves (16).

In the quasi-experimental doctoral thesis conducted by Akdemir with the participation of 60 nursing students, it was determined that the web-based education applied in addition to the demonstration method had a positive effect on the skill education of nursing students (17).

In the experimental type doctoral thesis conducted to evaluate the effect of web-assisted teaching on the learning of bladder catheterization by nursing students, it was found that the knowledge and skill averages of the experimental group students were higher than the average points of the control group students (18).

Karabağ Aydın found that the use of a web-based teaching method increased students' ability to calculate drug doses in a pretest-posttest comparative thesis study (19).

In the experimental designed doctoral thesis, which aimed to determine the effect of web-based education and nursing approach education in multimodal analgesia on the

knowledge and practice skills of the students, it was found that the web-based teaching method, which was applied in addition to the in-class face-to-face education, was effective in helping students gain nursing skills for pain (20).

In the quasi-experimental type doctoral thesis conducted to examine the effect of web-based education given to pediatric nursing interns on the self-confidence and anxiety of pediatric nursing interns in their clinical decision-making skills, it was found that the application of the web-based education program was effective in increasing the self-confidence and lowering the anxiety levels in the clinical decision-making of the nursing students (21).

In the master's thesis conducted by Öztürk using the pretest-posttest control group design, it was found that web-assisted teaching is a more effective method for the drug dose calculation skills of nursing students compared to the traditional narrative (22).

In the master's thesis made by Erol, support was provided by using web-based training videos in addition to the classical classroom training and demonstration application in the education of students. The use of this method increased the students' ability to administer intramuscular injections. In addition, the satisfaction level of the students who applied the web-assisted education method was higher (23).

It was determined that the hypermedia method in nursing education has a positive effect on nutrition education through a nasogastric tube in the randomized controlled type doctoral thesis made by Turac (24).

It was found that web-based nursing process teaching affected students' ability to prepare a patient care plan with the nursing process approach in the quasi-experimental designed doctoral thesis conducted by Basit (25).

In the quasi-experimental designed master's thesis comparing the effects of web-supported education and peer education on the knowledge and skills of nursing students regarding stoma care, it was observed that the knowledge test mean scores of both groups increased significantly at the end of the training. The increase in knowledge scores was similar in the two groups. There was no statistically significant difference between the skill point averages of the groups (26).

It was found that web-based pain management education in children was effective in increasing the knowledge scores of nursing students in the pretest-posttest quasi-experimental design doctoral thesis conducted by Aydın (27).

It aimed to examine the effects of the education method based on the web-based video model method on the skill practices of Gynecology and Diseases Nursing, the satisfaction and the anxiety levels of the students before and after the skill practice in the

quasi-experimental doctoral thesis made by Kirlek (28). It was determined that the education method based on the web-based video model method positively affected the nursing students' learning and practice of clinical skills in the pregnant and puerperal women examination.

It was aimed to eliminate the lack of knowledge of student nurses on the prevention of infection in pediatric clinics and to evaluate the effectiveness of the web-based infection prevention education program in the quasi-experimental type of master's thesis made by Dernek (29). It was found that the infection prevention education given to nursing students increased their knowledge level of the students.

It was found that web-based simulation had a limited effect on the development of nursing students' clinical decision-making, while it had a significant effect on the development of triage practices in the quasi-experimental master's thesis conducted by Demir (30).

In the master's thesis conducted by Yıldırım, using a prospective randomized controlled pre-test-post-test control group design, the effect of web-assisted instruction on pediatric drug dose calculation on the knowledge level of nursing students was examined. In the study, only traditional teaching was applied to the students in the control group, and web-supported teaching was applied to the students in the intervention group in addition to the traditional teaching. It was found that the post-test scores

of the students in the intervention group increased twice, but there was no significant increase in the control group. In addition, there was a statistically significant difference between the number of students access to web-supported teaching and their post-test mean scores (31).

## DISCUSSION

In this study, 16 postgraduate thesis studies on the use of web-based education in undergraduate nursing students of universities in Turkey were examined. It is seen that the first thesis study was done in 2007 and most of the theses (62.5%) were doctoral theses, and the number of theses increased in 2017 and 2019. Web-based education requires the educator and student to have up-to-date information on technology use and to provide adequate infrastructure and technical equipment for students' access. Web-based education should be integrated into student education, and course content and course materials should be created. In addition to these, it is thought that the number of theses made in this field is limited due to the thought that nursing education requires intensive clinical practice, the use of technology in education has not yet become widespread enough, it has not been adopted, and due to economic inadequacies. Due to the COVID-19 pandemic, there have been significant changes in the field of education, as in many other fields. To control the spread of the coronavirus, many educational institutions

have entered the process of ensuring the continuity of education with the distance education method (32). As a necessity of this process, educators and students have experienced web-based education. Thanks to this experience, it is predicted that the method will be adopted more easily by the users, its use will become widespread and the studies in this field will increase.

When the thesis studies were evaluated according to their types, it was seen that only one of the theses was descriptive and methodological, while the other theses were experimental/semi-experimental. In three of the experimental/semi-experimental studies, web-based education was applied to a single group. While thesis studies in the field of nursing are mostly descriptive at the master's level, they are mostly experimental/semi-experimental at the doctoral level. The fact that rate of studies using experimental/semi-experimental methods is important in terms of evaluating the effectiveness of web-based education by making comparisons.

It was determined that half of the theses were made in the department of nursing principles when the departments/programs in which the theses are made are examined. It is seen that web-based education, which has a supportive and complementary role in nursing education, is suitable for application by other departments/programs. However, it is thought that studies could not be carried out in other

departments/programs due to the lack of information about technology use, infrastructure, and economic inadequacies.

In the results of the theses, it is seen that the use of web-based teaching methods in the education of nursing students has a positive effect on the students' gaining knowledge and skills. It is reported that the use of web-based learning in nursing undergraduate programs by integrating it into education creates a potential for students to better develop their clinical skills, pose less risk to patients, and provide a better quality of care (14). In the literature, studies are reporting the positive effects of web-based education (11, 14, 33, 34) as well as studies reporting negative opinions of students (35, 36). Jang et al. prepared a website for students to gain the ability to interpret electrocardiography on their own, and students had the opportunity to access the prepared course content from anywhere they wanted and to repeat the course content. As a result of the research, it was determined that there was an increase in the learning motivation and satisfaction of the students (33). Virtual and traditional teaching methods were applied in the training for nursing students to interpret cardiac arrhythmia, and the groups were compared. In the study, it was found that there was no difference between the groups before the training, and there were significant differences between the groups after the training (11). It has been found that the web-

based learning applied to nursing students on insertion of a urinary catheter, insertion of a nasogastric tube, taking a blood sample, and the insertion of a peripheral intravenous line effectively supports the clinical learning process of the students by providing virtual visual support, thanks to its ease of use and unlimited access. (14). It was determined that the clinical virtual simulation used in the education of Portuguese nursing students improved the retention of knowledge and the initial clinical reasoning over time (2 months) without affecting the overall perception of efficiency and improved student satisfaction with learning (34). In another study, students' opinions about the web-based patient education course given to nursing students were investigated. It was determined that the students had positive opinions about the design, method, and achievements of the course. In addition, students stated that it is appropriate to give web-based theoretical courses without application (6). In another study investigating student views on a web-based course, it was determined that students predominantly had a converging and assimilating learning style. In addition, it was determined that the students generally had positive opinions about the layout, visuals, typography, color, moving images, navigation and orientation, content, and functionality dimensions of the course design (5).

In another study, contrary to these findings, it was found that there was no difference in a



study comparing face-to-face education and web-based education in nursing students in terms of self-learning ability, clinical reasoning ability, and satisfaction (35). The feedback of nursing students on web-based distance education applied during the COVID-19 process was evaluated. It was determined that 84.4% of the students stated that web-based distance education was not as effective as face-to-face education, 49.9% of them could not communicate easily with the instructors, and 60.7% of them stated that web-based education allowed them to learn at their own pace (36). In another study in which medical and nursing students participated in India, it was determined that the majority of students had negative opinions about the lack of interaction and focus, practical learning, teaching content, and technological infrastructure regarding distance preclinical and clinical teaching applied during the COVID-19 process (7). In the pandemic situation, distance education practice is seen as the best way to be applied in education, but it does not seem possible to conduct the entire education on a web basis due to its limited effectiveness in teaching nursing courses that require clinical/field practice. However, it is thought that effective results will be obtained with the use of web-based education as a supportive and complementary method to face-to-face education.

### *Limitations*

Limitations of this study that are the theses in the database of the National Thesis Center of the CoHE and made in the nursing department were included in the study.

### **CONCLUSION**

In this study, postgraduate theses on the use of web-based-supported education in the nursing undergraduate programs of universities were examined in the nursing education process. As a result, it has been determined that most of the theses are doctoral theses and the studies have increased significantly in recent years. It was determined that the majority of theses were made in the experimental/semi-experimental type, and half of the theses were in the field of nursing principles. In all of the theses included in the study, it was determined that the support of face-to-face education with web-based education had a positive effect on the development of nursing knowledge and skills of students.

An important part of nursing education consists of clinical practices. It is not possible to carry out such a training program entirely with distance education. It is predicted that supporting some courses, which are carried out in the form of direct transfer of theoretical knowledge in the classroom, especially in classrooms with a large number of students, with web-based education will contribute positively to the acquisition of knowledge and skills by students.

These results suggest that the thesis studies on the use of web-based education in nursing undergraduate programs should be carried out in all nursing departments, and in-class education should be supported with web-based education, considering the individual

differences and learning styles of the students. In addition, it is recommended to encourage nursing educators to use this method and to conduct more experimental research using web-based education.

**Table 5.** Characteristics of the Methods Used in Graduate Theses

Authors (Year)	Type	Aim	Method	Number of Samples	Conclusion
Senyuva, (16)	Doctoral thesis	Preparation, development, implementation, and evaluation of the "Patient Education" course in nursing education as an example based on the web-based distance education method in line with the "Mixed Design Model", evaluation in line with the student's opinions and creating a resource for related researches.	A descriptive and methodological study	Sample of the study: 167	It was determined that the student's opinions about the Patient Education course prepared with the web-based method were generally positive. It was found that the difference between the students' self-study habit and their total point average from Information Form II was highly significant and this difference was in favor of the students who could study by themselves.
Akdemir, (17)	Doctoral thesis	To examine the effect of web-based learning applied to nursing students in addition to the demonstration method of basic nursing skills on the student's basic nursing skill level	Semi-experimental study	Sample of the study: 60	It has been found that the web-based education applied in addition to the demonstration method has a positive effect on the skill training of nursing students.
Ozturk, (18)	Doctoral thesis	To evaluate the effect of web-based instruction on nursing students' learning about bladder catheterization	Experimental study	Total: 111 Experimental group: 59 Control group: 52	It was found that the knowledge and skill averages of the experimental group students were higher than the averages of the control group students with the web-based teaching application.
Karabag Aydin, (19)	Doctoral thesis	To examine the effects of web-based instruction on nursing students' arithmetic and drug dose calculation skills	Pre-test – post-test comparative study	Sample group: 63	It was determined that the use of web-based teaching methods increased students' arithmetic and drug dose calculation skills.
Yilmaz Senyuz, (20)	Doctoral thesis	To determine the effect of nursing approach training in multimodal analgesia given with web-based education on students' knowledge and practice skills	Experimental study	Total: 69 Experimental group: 34 Control group: 35	It has been found that the web-based teaching method applied in addition to in-class face-to-face education is effective in helping students gain nursing skills for pain.
Bektas, (21)	Doctoral thesis	To examine the effects of web-based instruction on the self-confidence and anxiety levels of pediatric nursing interns in clinical decision-making.	Semi-experimental study	Total: 61 Intervention group: 31 Control group: 30	It was found that the application of the web-supported education program was effective in increasing the self-confidence level and reducing the anxiety levels of nursing students in clinical decision-making.
Ozturk, (22)	Master's thesis	To examine the effect of web-supported instruction on nursing students' drug dose calculation skills	Pretest-post-test with the control group study	Total: 95 Experimental group: 50 Control group: 45	It has been found that web-assisted teaching is a more effective method for nursing students' drug dose calculation skills compared to the traditional narrative.
Erol, (23)	Master's thesis	To examine the effect of the web-supported instruction applied on the intramuscular injection application of nursing students on the students' learning of intramuscular injection.	Semi-experimental study	Total: 66 Experimental group: 33 Control group: 33	In addition to the classical classroom training and demonstration practice, it was found that the student's ability to administer intramuscular injections increased as a result of the support of the students via the web using educational videos. Also, it was determined that the students who applied the web-assisted education method had higher satisfaction levels from the teaching method.

**Table 5.** Characteristics of the Methods Used in Graduate Theses (Continued)

Authors (Year)	Type	Aim	Method	Number of Samples	Conclusion
Turac, (24)	Doctora l thesis	To determine the effect of the education given with the hypermedia method on the students' learning of the nutrition application through the nasogastric tube	Randomized controlled	Total: 60 Experimental group:30 Control group: 30	It has been determined that the hypermedia method used in nursing education has a positive effect on the teaching of nasogastric tube feeding practice.
Basit, (25)	Doctora l thesis	To examine the effect of web-based nursing process teaching on senior nursing students' ability to prepare a care plan	Semi-experimental study	Total: 131 Intervention group:64 Control group: 67	It has been found that web-based nursing process teaching has an effect on the ability of students to prepare a patient care plan with the nursing process approach.
Kaplan, (26)	Master's thesis	To compare the effects of web-based instruction and peer education on the knowledge and skills of nursing students regarding stoma care	Semi-experimental study	Total: 67 Web-based education group:33 Peer education group:34	At the end of the training, it was observed that the knowledge test mean scores of both groups increased significantly. It was determined that this increase in knowledge scores was similar in the two groups. It was determined that there was no statistically significant difference between the skill point averages of the groups.
Aydin, (27)	Doctora l thesis	To evaluate the effectiveness of the web-based children's pain management training program given to nursing students	Pretest-posttest quasi-experimental design	Total: 94 Intervention group:45 Control group: 39	It has been determined that web-based children's pain management education is effective in increasing the knowledge scores of nursing students.
Kirlek, (28)	Doctoral thesis	To examine the effects of the web-based video model method on Gynecology Nursing skills practices, students' satisfaction levels, and students' anxiety levels before and after skill practice.	Semi-experimental design	Total: 80 Intervention group:40 Control group: 40	It has been determined that the web-based video model training method has a positive effect on the learning and practice of nursing students' clinical skills in pregnant women and puerperal examination.
Dernek, (29)	Master's thesis	To eliminate the lack of knowledge of student nurses on the prevention of infection in pediatric clinics and to evaluate the effectiveness of the web-based infection prevention education program	The pretest-posttest semi-experimental	Total: 35 Intervention group:19 Control group: 16	It was found that the web-based education given to nursing students increased the knowledge level of students on the prevention of infection.
Demir, (30)	Master's thesis	To examine the effect of web-based simulation on the development of triage practice and decision-making skills of nursing students	Semi-experimental design	Total 169 Intervention group:89 Control group: 80	It has been determined found that web-based simulation has a limited effect on the development of nursing students' clinical decision-making, while it has a significant effect on the development of triage practices.
Yildirim, (31)	Master's thesis	To examine the effect of web-assisted teaching given to nursing students on the level of knowledge about pediatric drug dose calculation.	A prospective randomized controlled design with the pretest-posttest control group	Total: 84 Intervention group:42 Control group: 42	It was determined that web-based instruction doubled the post-test scores of the students in the intervention group, but there was no significant increase in the control group. In addition, it was found that there was a statistically significant difference between the number of students entering web-assisted teaching and their post-test mean scores.

**Ethical Approval:** Since all of the postgraduate theses examined for the study can be accessed from the CoHE National Thesis Center database, which is open to access, the permission of the Ethics Committee was not obtained.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept: HY, NE, Design: HY, NE, Literature search: HY, NE, Data collection and Processing: HY, NE, Writing: HY, NE,

**Conflict of Interest:** The authors declare that there are no conflicts of interest.

**Financial Disclosure:** The author declared that this study has received no financial support.

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