

## The Effect of the Physical Examination Course on Self-Confidence, Anxiety, and Knowledge Levels in the Postoperative Clinical Decision-Making Process Among Nursing Students

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### Abstract

This study aimed to investigate the impact of a physical examination course on self-confidence, anxiety, and knowledge levels regarding postoperative clinical decision-making among nursing students. This quasi-experimental, pretest-posttest control group study focused on second-year students in the nursing department of a university situated in eastern Turkey. Without sample selection, all students who agreed to participate in the study and completed the questionnaires on both the first and last days of the physical examination course were included in the analysis. The data were collected using the “Sociodemographic Data Collection Form”, the “Abdominal Examination/Surgical Drain Follow-up Knowledge Test”, and the “The Nursing Anxiety and Self-Confidence with Clinical Decision-Making Scale”. Statistical analyses were conducted employing chi-square, Wilcoxon, and Mann-Whitney U tests. According to the results, post-test anxiety scores were significantly lower among participants in the experimental group than those in the control group ( $p<0.001$ ) and their self-confidence post-test scores were significantly higher. A positive and moderately significant correlation was observed between abdominal examination ( $p=0.004$ ), surgical drain follow-up ( $p=0.011$ ), and the self-confidence sub-dimension of the clinical decision-making scale. Additionally, a moderately significant negative relationship was identified between the anxiety and self-confidence levels of nursing students ( $p=0.014$ ). It is concluded that the physical examination course contributed to increased knowledge levels in abdominal examination and surgical drain follow-up, along with enhanced self-confidence in clinical decision-making and reduced anxiety levels.

**Keywords:** Physical examination, surgery, clinical decision-making, nursing education

### Introduction

Physical examination is a crucial process involving the comprehensive evaluation of the entire body to collect objective data about patients (Bayer, 2016; Olgun and Tosun, 2017). This data is pivotal for nurses to determine patients' care requirements and formulate appropriate care plans.

Originating from the era of Florence Nightingale, a physical examination has been a significant diagnostic tool in nursing (Weber and Kelley, 2014b). Its importance has only grown due to evolving nursing roles, historical shifts, and changes in patient demographics (D'Antonio et al., 2013). Notably, in Turkey, physical examination methods are an integral aspect of nursing

decisions (Regulation Amending the Nursing Regulation (T.C. Official Gazette, 19 April 2011, Issue: 27910).

Within the Turkish context, one study revealed that nurses primarily assessed patients' vital signs, level of consciousness, and peripheral pulse as part of their physical examination skills (Koç and Sağlam, 2012). Cross-cultural studies have shown that nurses across various settings tend to focus on a limited number of physical examination skills, emphasizing inspection, while neglecting routine physical examination procedures (Birks et al., 2013; Giddens, 2007; Cicolini et al., 2015). Zambas et al. (2016) found that nurses often conducted only cursory physical examinations, addressing immediate issues rather than conducting comprehensive assessments (Zambas et al., 2016). Similarly, Osborne et al.'s study highlighted that nurses frequently limited their examinations to vital signs, omitting thorough evaluations (Osborne et al., 2015). Similarly, in studies conducted with nursing students, it was reported that a limited number of physical examination skills were performed (Douglas et al., 2015; Kohtz et al., 2017). In the study conducted by Douglas et al., nursing students exhibited limited proficiency in 126 physical examination skills, with some skills being rarely performed (Douglas et al., 2015). Similarly, Kohtz et al.'s study indicated that nursing students possessed competence in only a restricted set of physical examination skills (Kohtz et al., 2017).

A primary objective of nursing education is to equip students with the competence to enhance patient care and ensure their safety (Robinson et al., 2013). To achieve this, education programs emphasize the teaching of essential skills, including physical examination assessment, to nursing students and healthcare professionals during their undergraduate studies (Park et al., 2016).

Physical examination methods constitute a pivotal element of the data collection phase within the nursing process (Birks et al., 2013; A. Fennessey & Wittmann-Price, 2011). Through physical examination and the subsequent clinical decision-making, the care needs and issues of both healthy and sick individuals and their families are identified, serving as the foundation for planning, implementing, and assessing the outcomes of necessary nursing interventions. Clinical decision-making, an essential skill involved in all stages of the nursing process, should be developed in all healthcare professionals and nurses.

Nurses, as healthcare professionals, analyze data concerning changes in patients' conditions, prioritize tasks, and make well-informed clinical care decisions, which directly impact patient care outcomes and safety (Al-Dossary et al., 2016; Choi et al., 2015). In line with this, the World Health Organization (WHO) advocates the development of clinical decision-making skills in nursing education as the gold standard (WHO, 2023). Therefore, it is crucial to assess nursing students' perceptions of decision-making, self-confidence levels, and anxiety, while also focusing on enhancing and evaluating their decision-making abilities (Bucknall et al., 2016).

Given this context, our study aimed to assess the effect of a physical examination course on nursing students' self-confidence, anxiety levels, and knowledge in the context of postoperative clinical decision-making processes.

### Research questions

Does the physical examination course influence nursing students' abdominal examination knowledge scores?

Does the physical examination course influence nursing students' surgical drain follow-up knowledge scores?

Does the physical examination course influence nursing students' self-confidence and anxiety levels in clinical decision-making?

## Method

### Purpose and type of research

This study employs a quasi-experimental pre-test post-test control group design to assess the influence of a physical examination course on nursing students' self-confidence, anxiety, and knowledge levels regarding clinical decision-making in postoperative scenarios. The independent variables of the study were the descriptive characteristics of the students, and the dependent variables were the self-confidence, anxiety, and knowledge levels of the students in clinical decision-making.

### Population and sample of the study

The study was conducted with 91 second-year nursing students at a university located in the eastern part of Turkey during the spring term of the 2022-2023 academic year. Among them, students who enrolled in the physical examination course were assigned as the experimental group, while those who opted for different elective courses were assigned as the control group. Given the accessible nature of the population, no specific sample selection criteria were applied. Ultimately, 60 students (experimental group n=30; control group n=30) who voluntarily participated within the specified timeline and completed the questionnaires both on the first and last days of the physical examination course were included in the study. The sample comprised students who agreed to participate and had no physical examination training.

**Physical examination course:** The primary objective of this course is to equip nursing students with a comprehensive understanding of physical examination, encompassing both theoretical knowledge and attitudes. The course curriculum was created by the investigator after reviewing the literature, and it was scheduled for a duration of 14 weeks, involving two instructional hours per week (a total of 28 hours). The instructional approach employed by the investigator encompassed computer-mediated presentations, hands-on laboratory exercises, and a pedagogical framework centered around written case-based learning methods.

### Data collection and data collection tools

The data were collected using the "Sociodemographic Data Collection Form", the "Abdominal Examination/Surgical Drain Follow-up Knowledge Test", and the "The Nursing Anxiety and Self-Confidence with Clinical Decision-Making". The data were collected using face-to-face interviews with the students before they started the clinical practice and at the end of the practice (at the end of the fourteenth week). The questionnaire took an average of 10-15 minutes to answer.

**The Sociodemographic Data Collection Form:** It consists of five questions to determine the students' age, gender, high school graduation, and grade point average.

**The Abdominal Examination/Surgical Drain Follow-up Knowledge Test:** In the form containing multiple-choice questions with four options, the correct answers received one point, and the wrong answers received zero points. In the 30-question test, the lowest score is zero (0), and the highest score is 30. The scoring was then converted to a 100-point system. High scores indicate high success. To ensure content validity, the Davis technique was employed

after the test was formulated. It was determined that all the questions created for the knowledge test would be incorporated into the measurement instrument.

**The Nursing Anxiety and Self-Confidence with Clinical Decision-Making Scale:** The Nursing Anxiety and Self-Confidence with Clinical Decision Making (NASC-CDM) scale was developed by Krista A. White in 2011 to assess nursing students' anxiety and self-confidence in clinical decision making. Separate scores for self-confidence and anxiety are obtained from the scale, which consists of 27 questions in total (White 2011). The Turkish validity and reliability of the scale were evaluated by Bektaş et al. (2015) in 2015. In this study, the total Cronbach's alpha was 0.933 for the self-confidence section of the scale and 0.938 for the anxiety section.

### Ethical considerations

Written permissions were obtained from both the Gümüşhane University Scientific Research and Publication Ethics Committee (under the reference number E-95674917-108.99-181840) and the Recep Tayyip Erdoğan University Faculty of Health Sciences Dean's Office (under the reference number E-98295262-044-2001) to initiate and carry out the research. Beforehand, the purpose of the study, the application process, and the anticipated results were comprehensively explained to the nursing students who were to be involved in the study, and their written consent was obtained. The research adhered to the principles of the Declaration of Helsinki.

### Data evaluation

The data were analyzed using the Statistical Package for the Social Sciences 23.0, also known as IBM SPSS Statistics 25 software. Categorical variables were presented as numbers, percentages, and frequencies, while continuous variables were described using measures like mean, standard deviation, median, minimum, and maximum values. The normal distribution of each variable's data was assessed through the Shapiro-Wilk test, and the equality of variances among groups was examined using the Levene test. Assuming the skewness and kurtosis values for the data fell within the range of -2 to +2, it was considered that the assumptions of normal distribution were satisfied, allowing for further analysis. Various statistical tests were employed to assess the data, including the Mann-Whitney U test, Wilcoxon test, and Spearman correlation analysis.  $p<0.05$  was considered statistically significant.

### Results

There were no statistically significant differences observed between the experimental and control groups in terms of age, gender, and previous evaluations of abdominal and surgical drain conditions ( $p>0.05$ ) (Table 1).

Both the experimental and control group students exhibited significantly higher scores after the intervention for abdominal examination and surgical drain follow-up ( $p<0.001$ ). The participants in the experimental group achieved significantly higher post-test scores for both abdominal examination and surgical drain follow-up than those in the control group ( $p=0.042$ ,  $p=0.012$ , respectively). The effect sizes of abdominal examination and surgical drain follow-up post-test scores, which had statistically significant differences between the groups, were clinically moderately effective ( $d=0.460$ ,  $d=0.698$ , respectively) (Table 2).

No significant difference was determined between the pre-test scores of the NASC-CDM for both the experimental and control group participants ( $p>0.005$ ). However, the post-test anxiety scores among the experimental group participants were significantly lower than those of the control group ( $p<0.001$ ), while the self-confidence post-test scores exhibited a statistically

significant increase ( $p<0.001$ ). The effect sizes calculated for the anxiety and self-confidence post-test scores, which displayed significant differences between the groups, were found to have clinically effective impacts at levels of low ( $d=0.275$ ) and high ( $d=1.321$ ) significance, respectively (Table 3).

Furthermore, a moderately significant positive correlation was found to exist between the self-confidence sub-dimension of clinical decision-making in nursing and both abdominal examination ( $p=0.004$ ) and surgical drain follow-up ( $p=0.011$ ). A negative and moderately significant correlation was determined between anxiety and self-confidence levels among the students ( $p=0.014$ ). However, no statistically significant relationship was detected between the anxiety sub-dimension of clinical decision-making in nursing and either abdominal examination or surgical drain follow-up ( $p>0.05$ ) (Table 4).

**Table 1.** Comparison of sociodemographic characteristics of the students in the experimental and control groups (n=60)

Characteristics	Experimental Group (n=30)		Control Group (n=30)		Statistical Analysis
	n	%	n	%	
<b>Gender</b>					
Female	25		21		$\chi^2 = 2.455$
Male	5		9		$p=0.117$
<b>A previous abdominal assessment</b>					
Yes					$\chi^2 = 0.098$
No	7		6		$p=0.754$
	23		24		
<b>A previous surgical drain evaluation</b>					
Yes					$\chi^2 = 0.577$
No	5		3		$p=0.706$
	25		27		
<b>Age (Mean±SD)</b>	20.26±0.69		20.10±0.88		Z = -1.074 $p=0.283$

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**Table 2.** Intragroup and intergroup comparison of the pre-test and post-test scores of the Abdominal Examination/Surgical Drain Follow-up Knowledge Test of the experimental and control groups (n=60)

Measurement time	Experimental group (n=30)		Control group (n=30)		Test value	p*	d
	$\bar{X} \pm SD$	Median (25-75 percentile)	$\bar{X} \pm SD$	Median (25-75 percentile)			
Abdominal Examination Knowledge Test							
Pre-test	67.93±7.91	65.50 (61.50-75.00)	68.96±8.16	70.00 (62.75-75.00)	-0.424	0.672	
Post-test	75.40±7.87	75.00 (71.75-80.00)	72.16±6.10	72.00 (70.00-75.75)	-1.940	0.042	0.460
Test value; p**	-4.449;<0.001		-2.607;<0.001				
Surgical drain follow-up knowledge test							
Pre-test	69.50±5.74	68.00 (65.00-75.25)	68.06±4.03	68.00 (65.00-70.00)	-0.864	0.388	
Post-test	75.90±5.40	75.00 (72.00-80.00)	72.63±3.83	72.00 (70.00-75.00)	-2.501	0.012	0.698
Test value; p**	-4.621;<0.001		-4.617;<0.001				

\*Mann-Whitney U test, \*\*Wilcoxon test

**Table 3.** In-group and inter-group comparison of the pre-test and post-test scores of the Clinical Decision-Making Self-Confidence and Anxiety Scale in Nursing of the experimental and control group participants (n=60)

The Nursing Anxiety and Self-Confidence with Clinical Decision-Making Scale	Experimental group (n=30)		Control group (n=30)		Test value	p*	d
	Median (25-75 percentile)	Median (25-75 percentile)	Median (25-75 percentile)	Median (25-75 percentile)			
<b>Anxiety sub-dimension</b>							
Pre-test	87.06±7.04	88.00 (85-90)	87.33±6.94	88.00 (81-92)	-1.233	0.218	
Post-test	81.40±7.25	81.50 (74-88)	83.50±8.02	85.00 (77-90)	-3.770	<0.001	0.275
Test value; p**	-2.586; 0.010		-2.554; 0.011				
<b>Self-confidence sub-dimension</b>							
Pre-test	74.26±6.99	75.00 (69-78)	73.53±7.22	75 (67-80)	-0.208	0.835	
Post-test	89.80±9.68	90.00 (84-96)	78.70±6.89	79.00 (74-83)	-4.601	<0.001	1.321
Test value; p**	-4.711; <0.001		-4.203; <0.001				

**Table 4.** The relationship between abdominal examination and surgical drain follow-up and the post-test measurements of the Nursing Anxiety and Self-Confidence with Clinical Decision-Making Scale

	(1)	(2)	(3)	(4)
(1) Abdominal Examination Post Knowledge Test	1			
(2) Surgical Drain Follow-up Post Knowledge Test	r=0.591 p<0.001	1		
(3) Self-Confidence Subdimension Posttest	r=0.370 p=0.004	r=0.326 p=0.011	1	
(4) Anxiety Subdimension Posttest	r=0.068 p=0.605	r=0.238 p=0.067	r=-0.315 p=0.014	1

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## Discussion

Various studies have been conducted to investigate the proficiency of students and nurses in performing physical examinations (Demiray et al., 2020; Gök et al., 2020; Şahan et al., 2021; Eyüpoğlu et al., 2019; Çevik et al., 2018). However, until now, no research has specifically examined the impact of a physical examination course on the levels of self-confidence, anxiety, and knowledge in postoperative clinical decision-making among student nurses. Our findings indicated that the physical examination course could potentially have a positive influence, resulting in reduced anxiety levels during postoperative clinical decision-making as well as an enhancement in self-confidence and knowledge levels among nursing students. Consequently, our study seeks to contribute meaningfully to the existing literature in this field.

Throughout our study, the post-test scores for both the experimental and control groups regarding abdominal examination and surgical drain follow-up were higher than their respective pre-test scores. Notably, the post-test scores of participants in the experimental group for abdominal examination and surgical drain follow-up were higher compared to those of the control group. It was highlighted that a lack of knowledge is a significant factor contributing to the inadequate and irregular performance of physical examinations by nurses (Koç & Sağlam, 2012; Fennessey & Wittmann Price, 2011). The importance of comprehensive physical

examination by nurses was recognized as far back as the 1960s in North America, leading to its inclusion as a mandatory course in postgraduate programs (Aydin & Dörtbudak, 2004). In Turkey, while physical examination had previously been part of the curricula in certain nursing faculties at both the undergraduate and postgraduate levels, it was officially incorporated into the nursing education curriculum as a compulsory subject following an amendment made by the Ministry of Health in 2011 (TC Ministry of Health Modification to Nursing Regulation, 2011). Despite the delayed introduction, it is anticipated that the acquisition of physical examination skills—a fundamental independent responsibility of nurses—prior to graduation will contribute significantly to future nursing care quality and overall improvement. Studies have further demonstrated that the integration of physical examination skills into nursing education positively impacts the quality of patient care (Giddens, 2007; Birks et al., 2013). Our findings are consistent with the relevant literature.

Our study yielded noteworthy results, indicating that the post-test anxiety scores of participants in the experimental group were lower, while their self-confidence post-test scores were higher in comparison to the control group. It is widely acknowledged that the capability to conduct physical examinations is a crucial component of professional nursing practices (Fennessey et al., 2011; Giddens et al., 2009). Nursing students are also expected to demonstrate proficiency in performing physical examinations during their clinical practice (Douglas et al., 2016; Alamri & Almazan, 2018; Wu et al., 2014). Physical examination courses, integral to nursing education in many countries like the United States, Australia, Canada (Lesa et al., 2007), and New Zealand (Zambas et al., 2010), highlight the importance of educators focusing on teaching highly essential physical examination competencies for nursing (Anderson et al., 2014). Throughout their educational journey, students should acquire the necessary knowledge and skills regarding the significance and proper execution of physical examinations (Fan et al., 2015). Gaps in this area hinder the provision of quality patient care and can negatively impact professional self-confidence (Fennessey & Wittmann Price, 2011). Moreover, studies also reveal that a lack of self-confidence serves as a barrier for nurses to effectively employ their physical examination skills (Aydin et al., 2004; Douglas et al., 2015; Douglas et al., 2014). In line with these insights, our study outcomes highlight that students' self-confidence in clinical decision-making increases following their completion of the physical examination course. This suggests that the physical examination course effectively enhances students' self-confidence, thereby addressing one of the challenges associated with utilizing physical examination skills.

Our study revealed a positive and moderately significant correlation between the self-confidence sub-dimension of clinical decision-making in nursing and both abdominal examinations and surgical drain follow-up. As students' self-confidence levels increased, their anxiety levels decreased. Self-confidence is reported to play a vital role in fostering learning and achieving success (Akin et al., 2007). Aydin and Dörtbudak (2004) emphasized that nurses who lack comprehensive knowledge of physical examination skills often struggle with a lack of self-confidence (Aydin et al., 2004). In a study by Douglas et al., it was found that the barrier of low self-confidence in utilizing physical examination skills tends to diminish with an increase in the age/class of nursing students, indicating a higher level of knowledge (Douglas et al., 2015). Evidence shows that reducing anxiety levels and enhancing self-confidence among nursing students positively impacts their overall self-perception and clinical decision-making abilities, while diminished self-confidence and increased anxiety can impede the clinical decision-making process (White et al., 2014; Espinosa-Rivera et al., 2019).

## Conclusion

Nursing students must possess comprehensive professional knowledge and skills related to physical examination. To ensure the acquisition of this essential expertise, it is advisable to incorporate “Physical Examination” or “Diagnosis/Evaluation of Health” courses as mandatory components within nursing education curricula. Additionally, it is recommended to support post-graduation participation in certified courses and promote the integration of nursing-specific physical examination skills into healthcare settings.

Nursing educators should carefully assess the skills necessary for clinical practice and actively incorporate these skills into courses and practical sessions.

To improve self-confidence in the application of physical examination skills in clinics, we recommend that trainers and nurses support students and that the application of physical examination skills in clinics be made routine.

It is also recommended to develop policies and procedures to remove barriers to nurses' use of physical examination skills.

## Limitations

Our quasi-experimental pretest-posttest control group study has certain limitations. Firstly, the knowledge tests on abdominal examination and surgical drain follow-up, developed by our researchers, were exclusively administered within a single nursing department, so the generalizability of results is potentially restricted. Another aspect to consider is that the content of the tests might evolve over time. Therefore, it is recommended to periodically review and update the test content to align with current practices.

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