

ORIGINAL ARTICLE

The Impact of Practical Training Delivered in a Laboratory Setting on the Self-Efficacy and Self-Confidence of Those Engaged in a Dialysis Programme

Diyaliz Programı Öğrencilerine Laboratuvar Ortamında Verilen Uygulamalı Eğitimin Öz Yeterlilik ve Öz Güvenlerine Etkisi

¹Sevda Tüzün Özdemir , ²Şule Olgun 

¹Dialysis Program, İzmir Kavram Vocational School, Türkiye
²Operating Room Services Program, İzmir Kavram Vocational School, Türkiye

Correspondence

Sevda Tüzün Özdemir,
 Öğuzlar Mahallesi, 1251/2 Sokak. No:8
 35230 Konak/İzmir, Türkiye

E-Mail: sevdaozdmr86@gmail.com,

How to cite ?

Özdemir Tüzün S, Olgun Ş. The Impact of Practical Training Delivered in a Laboratory Setting on the Self-Efficacy and Self-Confidence of Those Engaged in a Dialysis Programme. Genel Tıp Derg. 2025;35 (3): 447-454

ABSTRACT

Aim: This study aimed to evaluate the impact of practical training provided to dialysis program students in a laboratory setting, using hemodialysis devices and necessary equipment, on their self-efficacy and self-confidence.

Methods: This quasi-experimental, cross-sectional study was conducted between February and May 2024 with 85 students. Participants were 18 years or older, able to read and write, and communicate in Turkish, without visual or hearing impairments, and voluntary participants. Visual and hearing impairments were excluded as they can significantly affect the learning process. Data collection tools included "the Individual Introduction Form" for sociodemographic data, the "General Self-Efficacy Scale" to assess self-efficacy, and the "Student Satisfaction and Self-Confidence in Learning Scale" to measure satisfaction and self-confidence in simulation-based learning.

Results: Among participants, 36.5% had no sleep issues, 57.6% were non-smokers, 87.1% voluntarily chose their program, and 61.2% reported good academic performance. Students frequently cited an interest in dialysis and a desire to help others as reasons for choosing the program (28.2%). While 47.1% were satisfied with their education, 54.1% reported no anxiety about post-graduation competency. However, anxiety related to fear of harming patients was commonly observed. There were no significant differences in self-efficacy scores before and after the laboratory-based training ($p > 0.05$), suggesting that the training did not significantly enhance self-efficacy. However, a majority of students reported high levels of satisfaction and confidence in learning following the training, with 43.3% expressing satisfaction with their learning experience, and 47.4% indicating increased confidence in learning.

Conclusions: Practical training provided in a laboratory setting is valuable for enhancing students' technical skills as well as their psychological preparedness. However, to further develop clinical competencies and address the emotional challenges associated with patient care, it is recommended that hospital-based practice be integrated into the curriculum. This approach could contribute to improving students' overall professional competence.

Keywords: Anxiety, dialysis, education, self-confidence, self-efficacy

ÖZ

Amaç: Bu çalışmada, diyaliz programı öğrencilerine hemodiyaliz cihazları ve gerekli ekipmanları kullanarak laboratuvar ortamında verilen uygulamalı eğitimin öz yeterlilik ve öz güvenlerine etkisinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler: Bu yarı-deneyisel, kesitsel çalışma, Şubat-Mayıs 2024 tarihleri arasında İzmir Kavram Meslek Yüksekokulu Diyaliz Programı'na kayıtlı 85 öğrenci ile gerçekleştirilmiştir. Çalışmaya, 18 yaş ve üzeri, okuma, yazma ve Türkçe iletişim kurabilen, görme ve işitme engeli bulunmayan ve gönüllü olarak katılan öğrenciler dahil edilmiştir. Görme ve işitme engelleri, öğrenme süreçlerini farklı şekillerde etkileyebileceğinden, bu engelleri olan bireyler çalışma dışında bırakılmıştır. Veri toplama araçları olarak "Birey Tanıtıcı Bilgi Formu", "Genel Öz-Yeterlilik Ölçeği" ve "Öğrenci Memnuniyeti ve Öğrenmede Öz-Güven Ölçeği" kullanılmıştır.

Bulgular: Katılımcıların %36,5'i uyku sorunu yaşamamış, %57,6'sı sigara içmiyor, %87,1'i programlarını gönüllü olarak seçmiş ve %61,2'si iyi bir akademik performans bildirmiştir. Öğrenciler programı seçme nedenleri olarak sıklıkla diyalize olan ilgerini ve başkalarına yardım etme isteklerini belirtmişlerdir (%28,2). %47,1'i eğitimlerinden memnunken, %54,1'i mezuniyet sonrası yeterlilik konusunda kaygı duymadıklarını bildirmiştir. Ancak, hastalara zarar verme korkusuyla ilgili kaygı yaygın olarak gözlemlenmiştir. Laboratuvar tabanlı eğitimden önce ve sonra öz yeterlilik puanlarında anlamlı bir fark yoktu ($p > 0,05$), bu da eğitimin öz yeterliliği önemli ölçüde artırmadığını göstermektedir. Ancak, öğrencilerin çoğunluğu eğitimden sonra öğrenmeye ilişkin yüksek düzeyde memnuniyet ve güven bildirmiş, %43,3'ü öğrenme deneyimlerinden memnuniyet duyduğunu ve %47,4'ü öğrenmeye ilişkin güveninin arttığını belirtmiştir.

Sonuçlar: Laboratuvar ortamında sağlanan uygulamalı eğitim, öğrencilerin teknik becerilerinin yanı sıra psikolojik hazırlanışlarını geliştirmede önemlidir. Ancak, klinik becerilerin daha ileri düzeyde geliştirilmesi ve hasta bakımına yönelik duygusal zorluklarla başa çıkabilmesi için hastane temelli uygulamaların da müfredata dahil edilmesi önerilmektedir. Bu yaklaşım, öğrencilerin genel mesleki yeterliliklerini artırmaya katkı sağlayabilir.

Anahtar Kelimeler: Anksiyete, diyaliz, eğitim, öz güven, öz yeterlilik

Introduction

The concept of self-efficacy is defined as an self-efficacy as "the belief in one's capacity to organize individual's belief in their ability to perform the skills and execute actions required to influence events and and competencies necessary to achieve expected achieve desired outcomes" (2,3). Self-efficacy plays outcomes in a specific area (1). Bandura described a crucial role in enabling individuals to assess their

abilities and capacities more objectively, manage stress effectively, and mitigate the adverse effects caused by stress. It also reflects confidence in one's capabilities, and a strong sense of self-efficacy often leads to improved performance (1,2,4).

The success of healthcare program students in clinical learning environments is influenced by several factors, including anxiety, stress, loss of control, motivation, and self-efficacy (2,4, 5). For decades, vocational schools offering health programs have provided training aimed at preparing mid-level healthcare professionals. Upon completing a two-year education program, students graduate with the title of "technician" (6). During this education, it is essential to support theoretical knowledge with practical training, including demonstrations and fieldwork, to ensure students transform their theoretical knowledge into professional behaviors (7,8). However, inadequate hands-on training during this period can lead to fears of making mistakes, perceptions of professional incompetence, and anxiety about encountering negative feedback in clinical settings. These issues may result in a lack of confidence and increased clinical stress among students (9).

A study conducted in Hong Kong reported that healthcare students experience moderate levels of stress during their education, with the most common stressor being a lack of professional knowledge and skills (10). Similarly, research conducted in Turkey found that a significant proportion of students experienced anxiety and concerns about their future professional competence due to insufficient hands-on training and field experience (11). In contrast, Germany's education policy mandates that vocational training constitutes 79% of the total curriculum in such programs. Research indicates that pre-graduation laboratory and clinical practice courses are crucial for professional competence. The absence of such training has been associated with insufficient learning outcomes (90.2%) and negative emotions such as fear and anger regarding the future (66.4%) (12).

Dialysis treatment is a procedure requiring specialized skills and experience. Insufficient knowledge and skills among students to take on active roles in the treatment and care of dialysis patients may lead to reduced self-management and self-efficacy. Therefore, implementing an empowerment program to enhance students' knowledge and self-efficacy may be necessary (13). This study aims to evaluate the impact of practical training provided in a laboratory

setting using dialysis machines and related equipment on the self-efficacy and self-confidence of dialysis program students. The training program is designed to improve the self-efficacy and professional skills of these students.

Materials and Methods

Design

This study was designed as a quasi-experimental and cross-sectional study.

Study Setting and Sample

This study was conducted from February to May 2024, involving 85 students enrolled in the Dialysis Program at İzmir Kavram Vocational School. All students enrolled in the program during the spring semester were invited to participate in the study, and all 85 students voluntarily participated. Participants were required to be 18 years or older, able to read, write, and communicate in Turkish, without visual or hearing impairments, and had to provide informed consent to participate in the study. Students who met these inclusion criteria and gave their consent were included in the study. Throughout the semester, students participated in weekly, 3-hour hands-on training sessions on hemodialysis treatment in a laboratory setting. The pre-test surveys and scales were distributed online via Google Forms at the beginning of the spring semester. The post-test surveys and scales were distributed online at the end of the 12-week intervention period.

Hypotheses of the Study

H₀:

Practical training provided in a laboratory setting does not affect the self-efficacy of dialysis program students.

H₁:

Practical training provided in a laboratory setting affects the self-efficacy of dialysis program students.

Data Collection

Data were collected using three instruments: the Participant Information Form, the General Self-Efficacy Scale (GSES), and the Student Satisfaction and Self-Confidence in Learning Scale (SSSCLS).

Participant Information Form

This 13-item form collected sociodemographic data, including variables such as age, gender, marital status, financial situation, sleep problems, smoking habits,

voluntary choice of school, academic performance, reasons for choosing the profession, satisfaction with the training received, and anxiety related to the field of study.

General Self-Efficacy Scale (GSES)

Developed by Sherer et al. (1982) and adapted into Turkish by Yıldırım and İlhan (2010), this 17-item scale assesses self-efficacy across three subscales: "Initiative," "Persistence," and "Sustained Effort." Responses are rated on a 5-point Likert scale, with higher scores indicating greater self-efficacy.

Student Satisfaction and Self-Confidence in Learning Scale (SSSCLS)

Developed by Jeffries and Rizzolo (2006) and validated in Turkish by Ünver et al. (2017), this scale measures student satisfaction and self-confidence in simulation-based learning. It consists of 12 items across two subscales: "Satisfaction with Current Learning" (5 items) and "Self-Confidence in Learning" (7 items). Higher scores reflect greater satisfaction and self-confidence.

All forms and scales were distributed and collected online via Google Forms. To ensure the confidentiality and ethical principles in the data collection process:

Informed Consent and Anonymity

Prior to participation, all students were fully informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw from the study at any time without any consequences. Informed consent was obtained through an electronic consent form, which was included at the beginning of the Google Forms survey. The consent form assured participants of their anonymity, as no personally identifiable information was collected during the survey process. Only participant ID numbers were used to match pre-test and post-test responses.

Confidentiality and Data Security

The data collected via Google Forms were stored securely on the Google platform, which complies with industry-standard security measures, including encryption. Access to the data was limited to the research team, ensuring that participant privacy was maintained throughout the study.

Ethical Approval

Ethical approval was obtained from the Ethics Committee of İzmir Bakırçay University (decision

number: 836/23) before the study started. The study was conducted in accordance with ethical guidelines and institutional policies, ensuring the protection of participant rights.

Intervention

At the beginning of the spring semester, students were informed about the study, and their consent was obtained. The intervention lasted 12 weeks, with students attending practical training sessions once a week for 3 hours. During these sessions, students were provided with equal opportunities to practice each of the required tasks, including arteriovenous fistula needle insertion, operating the hemodialysis machine, initiating, maintaining, and terminating dialysis procedures using mannequins, and disinfecting the hemodialysis machine. Throughout the semester, students received guidance and support from instructors, ensuring proper execution of tasks. The process was managed to ensure that all participants had the opportunity to perform each task under supervision. At the end of the semester, the same survey and scale forms were redistributed via Google Forms for students to complete.

Statistical Analysis

Data were analyzed using SPSS 21.0. Descriptive statistics were presented as frequencies, percentages, means, and standard deviations. The normality of data distribution was assessed using the Kolmogorov-Smirnov test. The test results indicated that the data did not follow a normal distribution ($p < 0.05$). Therefore, nonparametric statistical methods were applied.

For comparisons between two independent groups, the Mann-Whitney U test was used. Correlations between continuous variables were analyzed using the Spearman correlation test. For comparisons involving more than two groups, the Kruskal-Wallis H test was performed. Statistical significance was set at $p < 0.05$.

Results

The mean age of the participating students was 20.80 ± 0.42 years (Table 1). Of the students, 85.9% were female, 52.9% were first-year students, 67.1% reported their income was equal to their expenses, and only 2.4% were married. It was found that 36.5% of the students did not experience sleep problems, 57.6% were non-smokers, 87.1% had chosen the school voluntarily, and 61.2% rated their academic performance as good.

The majority of the students (28.2%) reported that they

Table 1. Sociodemographic and educational variables of the students

Variables	X±SD (Min-Max)	
Age (years)	20.80±0.42 (18-52)	
Gender	Number (n)	Percentage (%)
Female	73	85.9
Male	12	14.1
Class		
1st Class	45	52.9
2nd Class	40	47.1
Marital Status		
Married	2	2.4
Single	83	97.6
Economic status of the family		
Income less than expenditure	14	16.5
Income equal to expenditure	57	67.1
Income more than expenditure	14	16.5
Sleep Problems		
Yes	20	35.3
No	48	36.5
Sometimes	14	28.2
Smoking		
Yes	27	31.8
No	49	57.6
Sometimes	9	10.6
Preferring the school willingly		
Yes	74	87.1
No	11	12.9
School achievement status		
Very Good	3	3.5
Good	52	61.2
Middle	28	32.9
Low	2	2.4
Reason for choosing this profession		
Ease of finding a job (assignment etc.)	9	10.9
Because I have enough points	17	20.0
My parents asked me	6	7.1
I love the profession	24	28.2
I like to help people	24	28.2
Other	5	5.9
Satisfaction with the training received		
Completely satisfied	40	47.1
Partially Satisfied	33	38.8
Undecided	10	11.8
Partially dissatisfied	2	2.4
Completely dissatisfied	0	0
Anxiety about being competent in the field		
Yes	39	45.9
No	46	54.1
If yes, the reasons		
The thought of making a mistake	25	29.4
Fear of harming the patient	30	35.7
Difficulty in putting theoretical knowledge into practice	13	15.3
Fear of being evaluated by the instructor	4	4.7
Being in an unknown environment	2	2.4
Ambiguity of student roles	4	4.7
Lack of theoretical knowledge	7	8.2
Total	85	100

Descriptive statistics, Kruskal-Wallis H test, SD: Standard deviation

chose the dialysis technician profession because they enjoyed it and liked helping people. Additionally, 47.1% of the students expressed satisfaction with the education they received, while 54.1% stated that they did not feel anxious about their competency in the field after graduation. However, it was noted that students generally experienced anxiety due to fear of causing harm to patients.

General Self-Efficacy Scores and Analysis Based on Variables

According to the test results presented in Table 2, no significant difference was found between the pre- and post-training scores on the General Self-Efficacy Scale for students participating in the study and receiving practical training in the laboratory setting ($p > 0.05$). These findings suggest that the laboratory-based practical training was insufficient in enhancing students' general self-efficacy.

Table 2. Wilcoxon signed-rank test results for students' general self-efficacy scale scores before and after practical training in the laboratory

Post test-pre test Scale Subscales	n	Rank Mean	Rank Total	Z	p
Start	Negatives	42	42.32	-0.756	0.450
	Positives	38	38.49		
	Equal	5	1462.5		
Perseverance	Negatives	36	36.26	-0.588	0.556
	Positives	33	33.62		
	Equal	16	1109.5		
Sustain	Negatives	38	41.89	-0.462	0.644
	Positives	39	36.18		
	Equal	8	1411.0		
Total Score	Negatives	46	41.24	-0.699	0.484
	Positives	37	42.95		
	Equal	2	1589.0		
Total			85		

Wilcoxon Signed-Rank Test

To determine whether the post-training scores on the three subscales and total scores of the General Self-Efficacy Scale differed based on gender and class level, a Mann-Whitney U test was conducted (Table 3). The analysis revealed no significant differences in students' average scores by gender or class level ($U = 437.0$, $p > 0.05$). This result indicates that the training program did not produce the expected impact on students, as no significant differences were observed in their performance before and after the training.

The distribution of item response scores for the scales measuring student satisfaction and confidence in learning after laboratory training is shown in Table

4. The total scale score was found to be 52.51 ± 10.7 out of a maximum of 61.00. As total scores increased, both student satisfaction and confidence in learning were observed to improve. The findings suggest that students' levels of satisfaction and confidence in learning from the laboratory training were generally high (Table 4).

Table 3. Status of students' final test scores on the general self-efficacy scale according to gender and class variables

General Self-Efficacy Scale Subscales Posttest Score	Rank Mean		Rank Total		U	p
	Female	Male	Female	Male		
Start	42.8	43.7	3130.5	524.50	429.5	0.914
Perseverance	42.7	44.3	3123.0	532.00	422.0	0.839
Sustain	42.7	44.6	3119.5	535.5	418.5	0.804
Total Score	43.0	42.9	3140.0	515.00	437.0	0.990
	1st Class	2nd Class	1st Class	2nd Class		
Start	39.96	46.43	1798.00	1857.00	763.00	0.227
Perseverance	41.53	44.65	1869.00	1786.00	834.00	0.558
Sustain	40.83	45.44	1837.50	1817.50	802.50	0.387
Total Score	40.27	46.08	1812.00	1843.00	777.00	0.278

Mann-Whitney U testi, Spearman Correlation

The Effects of Laboratory Training on Student Satisfaction and Self-Confidence

Following the laboratory-based practical training, the majority of students (43.3%) reported being satisfied with their learning experience. However, 36.47% of students expressed neutrality regarding the utility and effectiveness of the teaching methods used, while 47.06% stated that the instructional materials were motivating and supportive of learning. Additionally, 48.23% of students reported that the teaching methods aligned well with their individual learning styles.

In the confidence in learning subscale, most students (47.4%) indicated that their confidence increased as a result of the laboratory training. Furthermore, 44.7% of students reported that they fully understood the content delivered during the practical sessions. Nearly half (48.23%) stated that they had acquired the necessary knowledge and skills to fulfill clinical responsibilities, 47.05% noted that they understood how to utilize simulations to learn important aspects of clinical skills, and 52.94% reported knowing how to seek assistance when faced with concepts they did not understand during simulation training (Table 4).

Table 4. Distribution of Responses to Items on Student Learning Satisfaction and Self-Confidence Levels in Laboratory Training (n=85).

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	X±SS (Min-Max)	Cronbach Alpha
	n	n	n	n	n	n	
Satisfaction with Learning							
The teaching methods used in the simulation were useful and effective.	4	5	31	27	18	3.57±1.03	0.936
The simulation enhanced my learning in internal and surgical provided a wide range of learning materials and activities to develop.	4	6	24	37	14	3.60±1.02	
I liked the way my trainer taught the simulation.	2	5	22	39	17	3.75±0.93	
The teaching materials used in the simulation were motivating and helped me learn.	2	4	23	40	16	3.75±0.89	
The way my trainer taught the simulation suited my learning style.	3	7	17	41	17	3.73±0.99	
Confidence in Learning							
I am confident that I have fully learned the content of the simulation exercise provided to me by my trainer.	1	8	24	38	14	3.66±0.91	0.971
I am confident that this simulation exercise covers the critical knowledge content necessary for me to learn the internal and surgical fields.	1	7	21	40	16	3.74±0.90	
I am confident that I have gained the necessary knowledge and improved my skills from this simulation to fulfill my responsibilities in the clinical field.	1	4	23	41	16	3.79±0.85	
My trainers used useful resources to teach this simulation.	2	7	22	40	14	3.67±0.93	
It is my responsibility as a student to know what I need to learn from this simulation.	0	3	19	44	19	3.93±0.77	
I know how to get help when I don't understand concepts in the simulation.	1	9	37	89	34	3.87±0.81	
I know how to use the simulation to learn critical aspects of these skills.	1	3	25	40	16	3.79±0.83	
Total Scale Score						52.51±10.7	0.963

Frequency distributions, mean (\bar{X}), standard deviation (SD), and Cronbach's Alpha, Kruskal-Wallis H test, SD: Standard deviation

Discussion

This study examined the impact of practical training provided in a laboratory environment on the self-efficacy and self-confidence of dialysis program students. The findings indicated that students experienced an increase in their self-confidence and satisfaction levels following the laboratory training, with nearly half of the participants reporting that this experience positively prepared them for clinical responsibilities. However, some students expressed concerns about the fear of making mistakes and transferring theoretical knowledge into practice. This suggests a need to bridge the gap between theory and practice and to provide stronger support for students.

According to the results, the practical training provided in the laboratory did not lead to a significant change in the overall self-efficacy levels of the students. This indicates that educational programs need to be more comprehensive. Similar studies have noted that a lack of clinical training can increase students' anxiety levels and negatively affect their self-efficacy (6,18). Conversely, some literature reports that health education students demonstrate significant increases in self-efficacy and self-confidence as they gain experience in clinical practice (1,2,19). The lack of a significant difference in self-efficacy observed in the current study may indicate that the effects of such training can vary depending on different conditions.

Dikmen and colleagues (1) found that nursing students' perceptions of self-efficacy were related to the anxiety and stress they experienced during clinical practices. This finding aligns with our study, as students reported that uncertainties and high expectations in the clinical environment increased their stress levels. A strong perception of self-efficacy allows students to cope with such challenges effectively. The results of the present study highlight the need to strengthen students' self-efficacy not only through laboratory-based training but also with broader support strategies. Karatuzla and Bağcı (6) emphasized that students in health vocational programs require more support and guidance during their practical internships in terms of quality and efficiency. This suggests a need for greater intervention in practical training processes to enhance students' clinical experiences. A study by Açıksöz et al. (2) indicated that nursing students experiencing their first clinical encounters reported high levels of self-efficacy, which reduced their clinical anxiety; however, no significant relationship was found

with perceived clinical stress. These findings imply that enhancing students' self-efficacy levels could play a significant role in reducing clinical anxiety. Thus, it can be asserted that training programs aimed at strengthening self-efficacy among dialysis program students before they engage in clinical practices will provide important benefits in terms of anxiety and stress management, positively impacting their clinical performance and contributing to their professional development.

The literature presents several studies indicating that laboratory and simulation-based training can enhance students' perceptions of self-confidence and self-efficacy. Well-designed simulation programs, which are effective ways to boost self-efficacy, have been shown to strengthen students' learning experiences, increase their perceptions of professional competence, and reduce stress levels (20). Moreno-Cámara et al. (21) noted that clinical simulation serves as an effective bridge between theoretical and practical learning, fostering high levels of satisfaction among students while contributing to the development of clinical skills during the training process. Nonetheless, inadequacies in simulation duration and training in communication skills have identified areas for improvement to enhance students' professional capabilities more effectively. Additionally, research by Cho and Kim (20) demonstrated that robust educational practices and well-designed simulations could increase self-confidence and satisfaction levels, yielding effective outcomes when simulations are appropriately structured. Mirmazhari et al. (22) emphasized that self-efficacy is a critical determinant in individuals' perceptions of confidence and performance, noting that the development of this skill in both clinical and educational settings directly impacts not only academic success but also patient safety and outcomes. Similarly, Moreno-Cámara et al. (21) reported high levels of satisfaction with clinical simulation among nursing students, highlighting its effective bridging role between theoretical and practical learning, although dissatisfaction with simulation duration and communication training remains a concern that requires attention.

Stress and anxiety experienced during clinical practices are also related to students' perceptions of their education. Taslak and Işıkay (12) revealed that high levels of anxiety and hopelessness were associated with students' perceptions of their education, negatively affecting their educational

processes. In the current study, the challenges faced by students during their training were observed to directly impact their self-efficacy perceptions, consequently increasing stress and anxiety levels. Practical training is of great importance, particularly for students in health education. Tüzün Özdemir and Beyece İncazlı (11) highlighted that students with limited clinical practice experience during the pandemic reported high anxiety levels, adversely affecting their perceptions of self-efficacy. This underscores the necessity for practical training to address not only technical skills but also the emotional and psychological needs of students. In this context, enhancing students' self-efficacy levels is likely to contribute positively not only to their learning process but also to the quality of care provided to the patients they will serve.

The findings of this research indicate that students are generally satisfied with the practical training received in the laboratory, although some fundamental concerns persist. The literature suggests that a multidisciplinary approach is essential for enhancing the effectiveness of practical training. Research on simulation training indicates that particularly longer application sessions, individual feedback mechanisms, and the integration of stress management techniques may more permanently strengthen students' perceptions of self-efficacy (20,21).

Strengths and Limitations of the Study

One of the strengths of this study lies in its direct evaluation of the effects of practical training conducted in a laboratory setting. The research underscores the significance of hands-on training in enhancing students' professional competencies, providing valuable insights into the impact of such educational experiences on the self-efficacy and confidence levels of dialysis program students. Furthermore, the use of reliable measurement tools, such as the "General Self-Efficacy Scale" and the "Student Satisfaction and Self-Confidence in Learning Scale," supports the validity of the data obtained. This study has the potential to contribute to the curriculum development processes for training programs that require clinical skills, ultimately helping to ensure that students are better prepared for real-world practice.

However, several limitations of this study must be acknowledged. Notably, the research does not assess the long-term effects of the training, which restricts the understanding of how laboratory education influences students' responses to actual clinical situations they

may encounter in their professional lives. Conducting the study at a single institution complicates the generalization of the results to other programs, and the laboratory environment may not accurately reflect the challenges faced in real clinical settings. Additionally, the absence of a control group makes it challenging to isolate the effects of the training from other influencing factors, and the limited sample size constrains the applicability of the findings to a broader population within health education programs. These limitations must be considered when interpreting the results.

Conclusion

In conclusion, the findings of this study indicate that laboratory-based practical training alone may not be sufficient and highlight the need for more comprehensive support mechanisms. Well-designed educational strategies have the potential not only to enhance students' technical skills but also to strengthen their emotional resilience and professional confidence. Guidance and support mechanisms provided to students play a critical role in improving both their academic success and professional competencies.

In this context, it is essential to integrate clinical experiences where students can engage in actual patient care processes alongside laboratory training. Such experiences can reinforce technical skills while also enhancing students' abilities to cope with the psychological challenges they may face in clinical environments. Additionally, structured mentoring programs, regular feedback cycles, and supervised observational experiences should be incorporated into the training process. Providing students with constructive feedback on their clinical performance, encouraging peer learning, and facilitating simulation-based scenario training with guided debriefing sessions can significantly contribute to building their professional confidence.

Consequently, this holistic approach, which combines laboratory-based training with structured mentorship, continuous evaluation, and real-world clinical exposure, can facilitate the development of students into well-equipped, confident, and effective healthcare professionals in clinical practice.

Conflict of interest

The authors declare that they have no conflict of interest.

Financial support

This study was supported within the scope of İzmir Kavram Vocational School Scientific Research Project (BAP).

Acknowledgment

This study was supported by the Scientific Research Projects Coordination Unit of İzmir Kavram Vocational School. The authors would like to thank the dialysis students participating voluntarily in the study for their valuable contributions.

References

1. Dikmen Y, Denat Y, Başaran H, Filiz NY. Investigation of self-effectiveness and self-efficacy levels of nursing students. *J Contemp Med*. 2016;6(3):206–13.
2. Açıksoz S, Uzun Ş, Arslan F. Assessment of relationship between nursing students' self-efficacy and levels of their anxiety and stress about clinical practice. *Gulhane Med J*. 2016;58(1):129–35.
3. Schunk DH, DiBenedetto MK. Motivation and social cognitive theory. *Contemp Educ Psychol*. 2020;60:101832. doi:10.1016/j.cedpsych.2019.101832.
4. Alzayyat A, Al-Gamal E. A review of the literature regarding stress among nursing students during their clinical education. *Int Nurs Rev*. 2014;61(3):406–15. doi:10.1111/inr.12114.
5. Kim J, Park JH, Shin S. Effectiveness of simulation-based nursing education depending on fidelity: a meta-analysis. *BMC Med Educ*. 2016;16:152. doi:10.1186/s12909-016-0672-7.
6. Karatuzla M, Bağcı E. Evaluation of practice internship of health vocational school students in terms of quality and productivity. *J Health Serv Educ*. 2020;4(1):1–7. doi:10.35333/JOHSE.2020.188.
7. Beebe A, Blaylock A, Sweetser KD. Job satisfaction in public relations internship. *Public Relat Rev*. 2009;35:156–8.
8. Jeffries PR, Rodgers B, Adamson K. NLN Jeffries simulation theory: Brief narrative description. *Nurs Educ Perspect*. 2015;36(5):292–3.
9. Okuroğlu GK. The relationship between nursing students' self-efficacy regarding their clinical performance with their academic self-efficacy and academic achievement: descriptive study. *Turk Klin J Nurs Sci*. 2022;14(1):125–31.
10. Chan CK, So WK, Fong DY. Hong Kong baccalaureate nursing students' stress and their coping strategies in clinical practice. *J Prof Nurs*. 2009;25(5):307–13. doi:10.1016/j.profnurs.2009.01.018.
11. Tüzün Özdemir S, Beyce İncalı S. Variables affecting the anxiety levels of dialysis technician students in the COVID-19 pandemic process. In: Karagöz A, Baykan M, Akkokay P, editors. 3rd International Congress of Health Sciences and Biotechnology Book. Ankara: Gece Kitaplığı; 2022. p. 272.
12. Taslak S, Işıkay Ç. A study for the investigation of the nursing students' perceptions of education and anxiety and hopelessness levels: the case of the school of health. *J Suleyman Demirel Inst Health Sci*. 2015;6(3).
13. Hafezieh A, Dehghan M, Taebi M, Iranmanesh S. Self-management, self-efficacy and knowledge among patients under haemodialysis: a case in Iran. *J Res Nurs*. 2020;25(2):128–38. doi:10.1177/1744987120904770.
14. Sherer M, Maddux JE, Mercandante B, Prentice-Dunn S, Jacobs B, Rogers RW. The Self-Efficacy Scale: construction and validation. *Psychol Rep*. 1982;51(2):663–71.
15. Yıldırım F, İlhan İÖ. The validity and reliability of the general self-efficacy scale-Turkish form. *Turk Psikiyatri Derg*. 2010;21(4):301.
16. Jeffries PR, Rizzolo MA. Designing and implementing models for the innovative use of simulation to teach nursing care of ill adults and children: a national, multi-site, multi-method study. *Nurs Educ*. 2006;5(11):500–5.
17. Ünver V, Basak T, Watts P, Gaioso V, Moss J, Tastan S, Tosun N. The reliability and validity of three questionnaires: the student satisfaction and self-confidence in learning scale, simulation design scale, and educational practices questionnaire. *Contemp Nurse*. 2017;53(1):60–74.
18. Morales-Rodríguez FM, Pérez-Mármol JM. The role of anxiety, coping strategies, and emotional intelligence on general perceived self-efficacy in university students. *Front Psychol*. 2019;10:1689.
19. Kankaya H, Keskin H, Akyol A. Effects of clinical practicum on nursing students' self-efficacy: example of internal medicine wards. *Perspect Psychiatr Care*. 2022;58(4):1826–31. doi:10.1111/ppc.12995.
20. Cho MK, Kim MY. Factors associated with student satisfaction and self-confidence in simulation learning among nursing students in Korea. *Healthcare*. 2023;11(1060):1–10.
21. Moreno-Cámara S, da-Silva-Domingues H, Parra-Anguila L, Gutiérrez-Sánchez B. Evaluating satisfaction and self-confidence among nursing students in clinical simulation learning. *Nurs Rep*. 2024;14(2):1037–48.
22. Mirmazhari R, Ghafourifard M, Sheikhalipour Z. Relationship between patient activation and self-efficacy among patients undergoing hemodialysis: a cross-sectional study. *Renal Replace Ther*. 2022;8(40):1–10.