Making Decision Easier, Safer, and Better: Exploring Physical Therapy students´s satisfaction regarding simulated clinical environments at Universidad Europea de Canarias

S.E. Martín Pérez*[a,b], I.M. Martín Pérez*[b,c]

[a] Facultad de Ciencias de la Salud, Universidad Europea de Canarias, 1 Inocencio García, La Orotava, Santa Cruz de Tenerife, España 38300; [b]Escuela de Doctorado y Estudios de Posgrado, Universidad de La Laguna, s/n, Av/Astrofísico Francisco Sánchez, San Cristóbal de La Laguna, Santa Cruz de Tenerife, España, 38203; [c] Departamento de Medicina Física y Farmacología, Universidad de La Laguna, s/n Aparcamiento, Facultad de Ciencias de la Salud, Campus de Ofra, Santa Cruz de Tenerife, España, 38071.

ABSTRACT

Introduction: Simulated environments provide physiotherapists student`s interpersonal communication, interdisciplinary knowledge of the professionals and the clinical reasoning skills that could increase the learning and the satisfaction of potential applicants. **Aim**: To assess the satisfaction of physiotherapy graduates specializing in orthopaedic manual therapy with their learning experience in complex simulated scenarios. **Methodology**: A mixed-method cross-sectional study was conducted based on an online public survey following the statement STROBE from January 2023 to June 2023. A total of 5 simulation sessions carried out at European University of the Canary Islands began with a briefing by the students, followed by the simulation itself to end with a debriefing. At the end of the debriefing, an electronic questionnaire titled "*Simulation Activities Evaluation Questionnaire*" was administered designed from quantitative and qualitative questions to explore on student's learning and experience. For data recording, a Microsoft Excel sheet was used, including demographic characteristics such as genre, age, labor experience, etc. For statistical and thematic analysis, two independent researchers used the Jamovi 2.3.12 and ATLAS.ti software for numerical and qualitative variables respectively. **Results**: Overall satisfaction with complex simulation environments was moderate (Mean=8.74/10, SD=1.182). After the intervention, the students moderately agreed (Mean=8.39, SD=1.022) in having acquired the competencies on the relationship with patients. Moreover, the participants agreed that simulation activities have given them confidence to face real clinical practice (Mean= 8.10, SD=1.446). **Conclusion**: For physical therapy students specializing in OMT, simulation environments are a teaching method that promotes clinical skills such as decision-making, clinical reasoning, ethical commitment, communication skills, and empathy.
Keywords: Simulation, clinical, environments, innovation, education physical therapy, postgraduate.

1. INTRODUCTION

In recent years, as the quality of medical care has declined, the humanization of healthcare staff has become even more necessary, requiring future professionals to adopt biopsychosocial training in their clinical practice. However, teaching these soft skills is difficult to implement in real-life situations because the variability of clinical settings makes learning impossible. Clinical simulation environments are becoming increasingly important in university education as they provide a practical, safe and effective way to acquire soft skills as well as actual patient safety and well-being [1,2]. In addition, it provides the opportunity to combine theory with practice, allowing students to apply the acquired knowledge to real-life clinical settings [3].

An example of a clinical simulation environment is the use of high-fidelity mannequins to mimic the characteristics and physiological responses of real patients [4]. Students can practice medical procedures such as medical records, subjective assessments, objective assessments, and treatment recommendations on these mannequins and receive immediate feedback on their performance [5]. This enables students to improve their clinical skills and increase their confidence in treating real patients.

Particularly for physical therapists, clinical simulation environments also enable students to work in teams and practice interpersonal communication, interdisciplinary knowledge of professionals, and clinical reasoning skills with each other

and with patients [6]. They may face complex and challenging scenarios and must coordinate to make fast and effective decisions [7]. Through teamwork, students learn to respect the opinions of others and consider the perspectives of different health professionals to ensure comprehensive patient care [8]. Furthermore, these immersive environments represent a revolution in university education as they can provide students with practical, safe, and effective learning experiences [9]. Based on the above points and given the growing popularity of clinical simulation in the training of physical therapy professionals, we believe it is important to examine student satisfaction with learning gained in clinical simulation environments for a number of reasons. First, it is important to measure the effectiveness of this teaching tool to increase student compliance rates and avoid premature loss to follow-up. In this sense, it is said that students' satisfaction with clinical simulations may influence their perceptions of the quality of the education they receive, because if students are dissatisfied with the quality of clinical simulations, they may develop negative perceptions of the quality of their education. Education in general. Therefore, we aimed to assess the satisfaction of physiotherapy graduates specializing in manual therapy with their learning experience in complex simulated scenarios.

2. MATERIALS AND METHODS

2.1. Study question

The PECO (*Population, Exposure, Comparison* and *Outcome*) [10] research question of this project was: For Physiotherapy students specializing in OMT, how satisfactory are complex simulation environments with their learning experience?

2.2. Study design

A mixed-method cross-sectional study was conducted based on an online survey directed to physiotherapist who were enrolled into a Master in Orthopedic Manual Therapy at the European University of the Canary Islands (La Orotava, Spain) following the statement STROBE [11] from January 23, 2023, to June 18, 2023. A total of 5 complex simulation scenarios were conducted for the first time at the Simulation Hospital of the European University of the Canary Islands. Each simulation session begins with a briefing to provide students with information about the clinical situation of the patient they will care for. During the simulation, a student assumed the role of a professional whose goals were to obtain a complete medical history, make referral recommendations, identify a disease by its signs and symptoms, or apply specific treatments appropriate to the patient's needs. Finally, a debriefing was conducted, designed to identify students' emotions and critically evaluate the decision-making process. All participants received information about the overall objectives of the study and signed an informed consent form at the beginning of the study. The data obtained were stored in an anonymous database by the same researchers.

2.3. Participants

Inclusion and exclusion criteria

Consecutive, non-probability sampling was conducted based on the following inclusion criteria: (1) students in the postgraduate program in Orthopedic Manual Therapy for Pain Management at the European University of the Canary Islands, enrolled in the academic year 2022-2023, (2) those who have never participated in a learning simulation (3) with no age or gender restrictions. Otherwise, participants (4) who did not complete the entire simulation training program were excluded.

2.4. Instrumentation

Survey design

First, a consent form and participant information sheet were distributed, which must be read and signed before answering the questionnaire. The questionnaire included questions on personal data such as gender, age, years of experience, education level, type of employment status, type of employment contract and place of work. The Simulation Activity

Evaluation Questionnaire was then conducted based on quantitative and multiple response (0 = disagree, 10 = strongly agree) and qualitative open-ended questions focusing on their satisfaction with the learning experience.

Registration of survey data

A standardized data collection form was used using the statistical software SPSS Statistic 28 (IBM®), which allows registration and storage of obtained responses. To avoid transcription errors, registration of the data was also supervised by two researchers, I.M.P. and S.S.F. The survey was based on quantitative and qualitative questions regarding satisfaction, motivation, level of recommendation, level of knowledge gained, and benefit of the activity to clinical practice. For data extraction, statistical analysis, and thematic analysis, two independent researchers used SPSS Statistic 28 (IBM®) and ATLAS.ti (Scientific Software Development GmbH®), respectively.

3. RESULTS

3.1. Description of sample

A total of 23 out of 29 questionnaires (79.3%) were completed correctly, while n = 4 (13.8%) were not answered completely and n = 2 (6.9%) were excluded due to inclusion criteria of having previously participated in other clinical simulation scenarios. 43.5% (n = 10) of men and 56.5% (n = 13) of women participated in the survey, with nearly 91.3% (n = 21) aged between 20 and 30 years and only n=2 (8.7%) were 30-40 years old. All participants (n = 23, 100.0%) had a bachelor's degree in physical therapy. In terms of past work experience, 91.3% of the sample had 1 to 5 years of work experience, and only 2 respondents (8.7%) had more than 5 years of work experience. In terms of employment, the majority of participants (n = 19, 90.4%) were employed and only 4 (9.6%) were self-employed. In addition, 90.4% of people work full-time and 9.6% work part-time.

3.2. Main findings

Overall participant satisfaction with the clinical simulation environment was moderate, with a rating of 8.74 out of 10 (SD=1.182). Most students moderately agreed that prior theoretical knowledge was useful in developing simulated clinical practice (mean = 8.00, SD = 1.01). Furthermore, they generally agreed that through simulation they had acquired the skills outlined in the learning objectives (mean = 8.45, SD = 1.121). Additionally, students moderately agreed (mean = 8.39, SD = 1.022) that they improved patient relationship skills (e.g., decision-making, clinical reasoning, ethical commitment, communication skills, empathy, etc.) following the simulation scenario. In this sense, participants agreed that simulation activities gave them the confidence to face real clinical situations (mean = 8.10, SD = 1.446). Furthermore, they highlighted the role of this clinical simulation approach in making them confident in their professional performance (mean = 8.84, SD = 0.820). See **Table 1.** "*Simulation Activities Evaluation Questionnaire*" Regarding the results of the qualitative analysis, the responses have been summarized in **Table 2**. Open-ended responses and have been graphical represented in **Figure 1.** Atlas.ti Networks.

Table 1. "*Simulation Activities Evaluation Questionnaire*"

Quantitative – Multiple choice answer		
Questions	**Mean**	**SD**
"My previous theoretical knowledge has served for the development of clinical practice in simulation"	8.00	1.01
"I consider that through the complex clinical scenarios I have acquired the competencies that were marked in the objective of the activity"	8.45	1.121

"I consider that I have been able to develop specific competencies regarding the relationship with patients (decision making, clinical reasoning, ethical commitment, communication skills, empathy, etc.)"	8.39	1.022
"I consider that the simulation activities have given me security and confidence to face real clinical practice"	8.10	1.446
"I consider the simulation methodology as a safe learning environment"	8.84	0.820
"Overall satisfaction with the experience of simulation activities"	8.74	1.182

Table 1. "*Simulation Activities Evaluation Questionnaire*". Descriptive summary of the mean and standard deviation (SD) obtained in each of the questions of the questionnaire.

Table 2. *Open-ended responses.*

Qualitative – Open-ended answer
Participant 7: [...] "Practical and able to test real consulting situations for improvement" [...]
Participant 9: [...] "I find this type of clinical simulation very useful and transfers well to everyday practice" [...]
Participant 13: [...] "I think it enriches learning tremendously" [...]
Participant 15: […] "Simulation seemed new to me as I hadn't done this type of activity in my grade. It lets you see yourself in a real situation which is important to see if your knowledge is correct "[…]
Participant 16: […] "Experiences more practically oriented towards clinical practice are appreciated" [...]
Participant 20: [...] "Do more of this to improve our practice, reasoning and gain more confidence" [...]
Participant 21: […] "I find this activity very useful in helping us prepare for situations that may occur in the workplace every day and best address them" […]
Participant 22: […] "Analyze more details and more appropriate solutions for each case" […]
Participant 23: […] "Extremely interesting session that helped improve care for our patients" […]

Table 2. *Open-ended responses.* Summary of the main responses to the questions of the open-ended "*Simulation Activities Evaluation Questionnaire*" of the study participants.

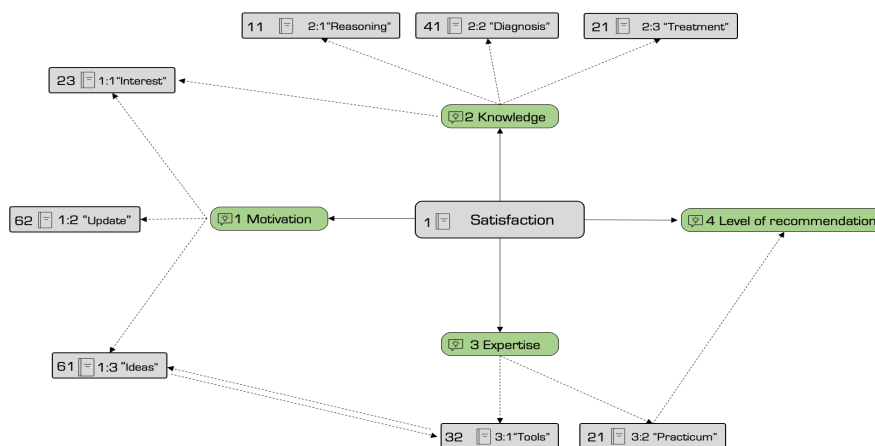**Figure 1.** *Atlas.ti Networks*

Figure 1. *Atlas.ti Networks* shows satisfaction as main analysis filed where students indicated to improve motivation, knowledge, expertise and level of recommendation. The vast majority mentioned to be an important experience to get better the diagnosis abilities followed by gathering tools and improving their treatment capability.

4. DISCUSSION

Integrating clinical simulation environments with health science students is a topic of growing interest in academia and healthcare settings. Based on our findings, satisfaction with integrating these new methods into physical therapy training is high. However, there are different views on the advantages and disadvantages of implementing it in the classroom. Some critics argue that clinical simulations can be expensive and do not accurately represent clinical reality [12,13]. It seems that some students feel that participating in simulations is different from interacting with real patients and therefore may not be as invested in the learning process. It also does not adapt to the different learning rates of students at the same academic level, which makes the tool difficult to implement in the context of student academic assessment. Our results support the idea that the prior knowledge students possess before facing complex simulations is key to advantageous learning and maximizing learning using this approach, making it particularly suitable for more advanced students.

Despite these potential shortcomings, most studies indicate that clinical simulation environment is a valuable tool for physical therapy teaching. However, little or nothing has been said about its application to postgraduate students in physical therapy, whose prior knowledge is expected to make simulation a more advantageous method for acquiring clinical skills to be performed in the real world. One of the main benefits of clinical simulation is that it allows them to acquire practical skills in a safe and controlled environment, without putting patients' health at risk: "*I find this type of clinical simulation very useful and transfers well to everyday practice*" [Participant 9]. In the same line, Toqan *et al.* (2023) supported that clinical simulation can improve students' confidence and security, which can translate into better patient care in the future [14]. Our results show how students support the use of clinical simulation as part of their training, since it allows them to act with more security and make better decisions in the professional field.

In this sense, a study by Smith *et al.* (2019) found that participants in clinical simulation sessions had better results on practical skills assessments than those who did not participate in such sessions [15]. Moreover, we consider that simulation is a valuable tool to integrate Biopsychosocial model of healthcare into Physiotherapy Education since it allows to identify emotions, thoughts, beliefs, and behaviors that occur in the healthcare field: "*Analyze more details and more appropriate solutions for each case*" [Participant 22].

Additionally, Sandoval-Cuellar *et al.* (2021) in an experimental study, found positive results in favor of enhancing clinical reasoning in the students who participated in the study [6]. Clinical simulation can be used to teach any interprofessional skills, meaning that students from different healthcare professions can work together to improve patient care. For example, a study by Lapkin *et al.* (2013) found that clinical simulation was effective in improving collaboration and communication between physical therapy and medical students [16]. In summary, the integration of clinical simulation environments in the teaching of Physiotherapy can have both pros and cons. However, most studies suggest that clinical simulation is a valuable tool that can improve student education and future patient care.

5. CONCLUSION

For physical therapy students specializing in OMT, simulation environments are a teaching method that promotes clinical skills such as decision-making, clinical reasoning, ethical commitment, communication skills, and empathy.

6. REFERENCES

[1] Lamé, G., & Dixon-Woods, M. "Using clinical simulation to study how to improve quality and safety in healthcare". BMJ simul. technol. enhanc. learn. 6(2), 87–94 (2020).

[2] Aggarwal, R., Mytton, O. T., Derbrew, M., Hananel, D., Heydenburg, M., Issenberg, B., MacAulay, C., Mancini, M. E., Morimoto, T., Soper, N., Ziv, A., & Reznick, R. "Training and simulation for patient safety". BMJ Qual. Saf., 19 Suppl 2, i34–i43 (2010).

[3] Van Soeren, M., Devlin-Cop, S., Macmillan, K., Baker, L., Egan-Lee, E., & Reeves, S. "Simulated interprofessional education: an analysis of teaching and learning processes". JIC. 25(6), 434–440 (2011).

[4] Kim, J., Park, J. H., & Shin, S. "Effectiveness of simulation-based nursing education depending on fidelity: a meta-analysis". BMC Med. Educ. 16, 152 (2016).

[5] Grant, D. J., & Marriage, S. C. Training using medical simulation. Arch. Dis. Child., 97(3), 255–259 (2012).

[6] Sandoval-Cuellar, C., Alfonso-Mora, M. L., Castellanos-Garrido, A. L., Del Pilar Villarraga-Nieto, A., Goyeneche-Ortegón, R. L., Acosta-Otalora, M. L., Del Pilar Castellanos-Vega, R., & Cobo-Mejía, E. A.

"Simulation in physiotherapy students for clinical decisions during interaction with people with low back pain:6eople6zedd controlled trial". BMC Med. Educ. 21(1), 375 (2021).

[7] Roberts, F., & Cooper, K. "Effectiveness of high-fidelity simulation versus low fidelity simulation on practical/clinical skill development in pre-registration physiotherapy students: a systematic review". JBI Database Syst. Rev Implement. 17(6), 1229–1255 (2019).

[8] Hough, J., Levan, D., Steele, M., Kelly, K., & Dalton, M. "Simulation-based education improves student self-efficacy in physiotherapy assessment and management of paediatric patients". BMC Med. Educ. 19(1), 463 (2019).

[9] Baxter, S., Johnson, M., Chambers, D., Sutton, A., Goyder, E., & Booth, A. "Understanding new models of integrated care in developed countries: a systematic review". NIHR Journals Library. (2018).

[10] Morgan, R. L., Whaley, P., Thayer, K. A., & Schünemann, H. J. "Identifying the PECO: A framework for formulating good questions to explore the association of environmental and other exposures with health outcomes". Environ. Int.121(Pt 1), 1027–1031 (2018).

[11] von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., Vandenbroucke, J. P., & STROBE Initiative. "Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies". BMJ. 335(7624), 806–808 (2007).

[12] Lateef F. "Simulation-based learning: Just like the real thing". J. Emerg. Trauma Shock. 3(4), 348–352 (2010).

[13] Al-Elq A. H. "Simulation-based medical teaching and learning". J Family Community Med. 17(1), 35–40 (2010).

[14] Toqan, D., Ayed, A., Khalaf, I. A., & Alsadi, M. "Effect of High-Fidelity Simulation on Self-Satisfaction and Self-Confidence Among Nursing Students". SAGE Open Nurs, 9, 23779608231194403 (2023).

[15] Smith, T. S., Hogewood, C., Etheridge, S., Britt, S., & Vance, D. E. "Anxiety of Active and Passive Role Groups in Clinical Simulation: A Pilot Study". Nurs. Educ. Perspect, 40(1), 46–47 (2019).

[16] Lapkin, S., Fernandez, R., Levett-Jones, T., & Bellchambers, H. "The effectiveness of using human patient simulation manikins in the teaching of clinical reasoning skills to undergraduate nursing students: a systematic review". JBI Libr. Syst. Rev., 8(16), 661–694 (2010).