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Level of satisfaction of students of the bachelor's degree in nursing regarding clinical simulation

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ABSTRACT

Introduction: Nursing, as a theoretical-practical profession, may be visualized from the sociocultural constructivist perspective, where the student constantly acquires and generates new knowledge, in particular, after interventions with clinical simulators. **Objective:** To identify the level of satisfaction of students in the Bachelor's Degree in Nursing before clinical simulation in the laboratories of a public university of northwestern Mexico. **Methodology:** Quantitative and correlational study, at random sampling, and stratified probabilistic sample of 149 students per semester. The socio-demographic data card and the Questionnaire of Quality and Satisfaction of the Clinical Simulation Classroom from the University of Cantabria were used, using Cronbach's Alpha of .912. **Results:** The mean age of participants was 20.66 years, in terms of sex 75.2% (f = 112) corresponded to female students. The average satisfaction with the use of the clinical simulation laboratory was 81.52. The variables of semester in which the student is enrolled (p=.000) and that the student is engaged in a remunerated activity (p=.041) have a statistically significant relationship to the level of satisfaction. **Conclusions:** Data obtained showed that the students are very satisfied with the clinical simulation.

Key words: Simulation; nursing students; laboratory; nursing (DeCS).

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Nivel de satisfacción de estudiantes de licenciatura en enfermería ante la simulación clínica

RESUMEN

Introducción: Enfermería como una profesión teórico-práctica puede ser visualizada desde la perspectiva constructivista sociocultural donde el alumno adquiere y genera constantemente nuevos conocimientos, en particular, posterior a intervenciones con simuladores clínicos. **Objetivo:** Identificar el nivel de satisfacción de estudiantes de Licenciatura en Enfermería ante la simulación clínica en los laboratorios de una Universidad Pública del Noroeste de México. **Metodología:** Estudio cuantitativo y correlacional, muestreo aleatorio, muestra probabilística estratificada por semestre de 149 estudiantes. Se utilizó la Cédula de datos sociodemográficos y Cuestionario de Calidad y Satisfacción del Aula de Simulación Clínica de la Universidad de Cantabria, con Alpha de Cronbach de .912 **Resultados:** La media de edad de los participantes fue de 20.66 años, en cuanto a sexo 75.2% (f = 112) correspondió a femenino. La media de satisfacción con el uso del laboratorio de simulación clínica fue de 81.52. Las variables semestre que cursa (p=.000) y realiza actividad remunerada (p=.041) se relacionan de forma estadísticamente significativa con el nivel de satisfacción. **Conclusiones:** Los datos obtenidos demuestran que los estudiantes se encuentran muy satisfechos con la simulación clínica.

Palabras clave: Simulación; estudiantes de enfermería; laboratorio; enfermería (DeCS).

Nível de satisfação dos estudantes do curso de enfermagem em relação à simulação clínica

ABSTRATO

Introdução: A enfermagem, como profissão teórico-prática, pode ser visualizada na perspectiva construtivista sociocultural, onde o aluno adquire e gera constantemente novos conhecimentos, em especial após intervenções com simuladores clínicos. **Objetivo:** Identificar o nível de satisfação dos alunos do Bacharelado em Enfermagem antes da simulação clínica nos laboratórios de uma universidade pública do noroeste do México. **Metodologia:** Estudo quantitativo e correlational, por amostragem aleatória, e amostra probabilística estratificada de 149 alunos por semestre. Foram utilizados o cartão de dados sociodemográficos e o Questionário de Qualidade e Satisfação da Sala de Aula de Simulação Clínica da Universidade da Cantábria, usando o alfa de Cronbach de 0,912. **Resultados:** A idade média dos participantes foi de 20,66 anos, em termos de sexo, 75,2% (f =112) corresponderam a alunas. A satisfação média com o uso do laboratório de simulação clínica foi de 81,52. As variáveis do semestre em que o aluno está matriculado (p=0,000) e que o aluno está envolto em uma atividade remunerada (p = 0,041) têm uma relação estatisticamente significativa com o nível de satisfação. **Conclusões:** Os dados obtidos mostraram que os alunos estão muito satisfeitos com a simulação clínica.

Palavras chave: Simulação, estudantes de enfermagem, laboratório, enfermagem (DeCS).

INTRODUCTION

In 1938 John Dewey proposed a theoretical-pedagogic perspective in which he considered that the student learns from the activities he carries out himself. Later on, Donald Schon retook the idea and incorporated the notion of practical knowledge and in-action learning, through which he intended that students could generate new knowledge from previous situations. Each situation is essential in the learning process. From there, repositories of information were created, which may be used later on by the subject in order to carry out some activity. Vygotsky retook these ideas and generated social constructivism, in which the idea that the context in which knowledge is developed significantly impact the experience of the subject, since the interaction occurs in an intentionally structured environment. In recent years, the incorporation of academic spaces such as the nursing laboratories represent a valuable pedagogic strategy that allows the development of skills through simulated situations; the students experience scenarios similar to those they will face when they get to a hospital [1].

Nursing as a theoretical-practical profession may be visualized from the sociocultural constructivist perspective, where the student constantly acquires and generates new knowledge, especially, after interventions with clinical simulators. The student is provided tools that help him to face clinical situations inside a classroom; additionally, he should put such tools into practice in order to face the caring needs of real patients.

In order to ease this process, education institutions have decided to acquire new technologies that improve the learning process of their students, through the incorporation of nursing laboratories where one of the best work tools is the use of high fidelity clinical simulators that allow recreating contexts similar to real ones. Among the most outstanding simulators we have: a) high fidelity dummies, b) anatomic models and of virtual reality systems.

This is how groups of nursing students face experiences similar to those they will experience in the clinical environment, and since this experience becomes attractive to them, skill development and confidence level improve; thus, contributing to the formation of professionals who combine their experiences and reduce the error index in real practice. Experimental, quasi-experimental, descriptive, non-experimental, and intervention surveys have been performed, regarding the use of clinical simulation as new teaching tool in education institutions, this in countries such as Colombia and the United States. The studies show that the use of clinical simulators currently represent an educational innovation tool that contributes to the improvement of scholar performance and achievement levels, favoring the adaptation to clinical situations achieving self-control in students. The main conclusions lead to the fact that the use of teaching strategies such as clinical simulation considerably reduces the stress in the students; therefore, their performance in clinical procedures is more beneficial, higher evaluation points are obtained, and they prove to be more satisfied and at ease and satisfied with the use of clinical simulation. Thus, the use of this novel tool is each time more necessary in education institutions for the teaching of professional nursing [2-6].

In this context, the objective of this research is to identify the level of satisfaction of the students of the Bachelor's Degree in Nursing in face of the clinical simulation in the laboratories of a public university of northwestern Mexico.

METHODOLOGY

Type of study

Quantitative and correlational study design [7].

Inclusion criteria

a) Students of the Bachelor's Degree in Nursing who were enrolled in theoretical-practical courses where low, medium, and high complexity procedures are performed (second, fourth, and sixth semester respectively), and b) Students of the Bachelor's Degree in Nursing who accepted to participate.

Non inclusion and exclusion criteria

a) Students of the Bachelor's Degree in Nursing who were not enrolled in theoretical-practical courses where procedures of low, medium, and high complexity were carried out, and b) Students of the Bachelor's Degree in Nursing who did not accept to participate.

Variables of study

Students' socio-demographic data: Age, grade average, sex, semester, student's status, belonging to an ethnical group, place of origin, performing remunerated activity.
Perception of the quality of the clinical simulation: Usefulness of the clinical simulation, scenarios, technical skills, critical reasoning and decision-making, theoretical knowledge, sense of security and trust, theoretical and practical integration, motivation, usefulness of recordings, duration of the case, teachers' training, team communication, prioritization of nursing performance, clinical competence, satisfaction with the experience.

Population, sampling and testing

The population corresponded to 466 students who were users of the nursing laboratories; the sampling was random and stratified, the sample was stratified and probabilistic per semester. It was estimated using the following parameters: 5%

Chart 1. Students of Bachelor's Degree in Nursing per semester

Semester	Population	Sample
Second semester (low complexity)	174	52
Fourth semester (medium complexity)	158	50
Sixth semester (high complexity)	134	47
	466	149

Source: Own development ***n*** = 149

error and 10% loss; the required size was of 149 students (Table 1). The formula for finite population was used:

$$n \geq \frac{N z^2_{1-\alpha/2} PQ}{z^2_{1-\alpha/2} PQ + d^2 (N-1)}$$

Where:
- N = Total of the population
- $Z\alpha$= Squared 1.96 (if security is 95%)
- p = Expected proportion (in this case 5% = 0.05)
- q = 1 – p (in this case 1-0.05 = 0.95)
- d = Accuracy (5%)

Data collection procedure

The research counted with the endorsement of the Research and Ethics Committees of the University of Sonora's Nursing Department (CEI-ENFERMERÍA-E-37/2017); after the authorization, a list of the students who were enrolled in the second, fourth and sixth semesters was requested to the Coordination of the Academic Program, with the purpose of selecting the participants at random. In order to build the sampling frame the Decision Analyst STATS 2 software was used; the participants were contacted in their classroom according to their schedule and group; they were explained the objective of the research, and were requested to read and sign the letter of informed consent. The questionnaire of socio-demographic variables and the Questionnaire of Quality and Satisfaction of the Clinical Simulation Classroom from the University of Cantabria were performed to those students who accepted to participate.

Plan of statistical analysis

Data were analyzed through descriptive and inferential statistics; the IBM SPSS Statistics, version 20, statistical software was used. In order to know the distribution of the variables the Kolmogorov-Smirnov test was used. Variables did not show a normal distribution, for which reason means were compared using a non-parametric approach with Mann-Whitney's U test and Kruskal Wallis.

Instrument of data collection

For data collection, a socio-demographic data card, prepared by the authors, which included variables such as sex, age, and semester, among others. With respect to the Questionnaire of Quality and Satisfaction of the Clinical Simulation Classroom from the University of Cantabria, this questionnaire is comprised by 15 questions that measure the student's level of satisfaction regarding the use of the clinical simulation, in a Likert-type scale which goes from Total Disagreement to Total Agreement, where Total Disagreement is equal to 1 and Total Agreement is equivalent to 5 [8].

In regard to the interpretation of the instrument, in its original form, the minimum value was 15 points, while the maximum value was 75; these were transformed into an index whose values ranged from 0 to 100, by means of the following formula: Satisfaction= ((sum (x1,x2...xn)-minimum value) / (maximum value – minimum value)) * 100. Later on, these were categorized (Chart 2).

Ethical considerations

This research complies with the Regulation of the General Health Act for Health Research [9]. Pursuant to Article 17, Section I, this research was not considered risky. The anonymity and confidentiality of the participants' data was respected; a letter of informed consent was provided to each participant.

RESULTS

Mean age of participants was 20.66 years, *SD* = 2.7, and age ranged from 18 to 39 years. In terms of sex, 75.2% (*f* = 112) corresponded to females, and 24.8% (*f* = 37) to males. In relation to the place of origin, 26.2% (*f* = 39) were from

Chart 2. Students' level of satisfaction in accordance to score values Questionnaire of Quality and Satisfaction of the Clinical Simulation Classroom from the University of Cantabria

Level of satisfaction	Score Values
Very dissatisfied	0 to 20
Dissatisfied	20 to 40
Indifferent	40 to 60
Satisfied	60 to 80
Very satisfied	80 to 100

Source: Own development ***n*** **=** 149

abroad. Regarding to belonging to an ethnic group, 1.3% (*f* = 2) stated they belong to an ethnic group.

In regard to the semester the participants were enrolled, 34.9% (*f* = 52) corresponded to the second semester, 33.6% (*f* = 50) to the fourth semester, and 31.5% (*f* = 47) to the sixth semester. About the semesters we worked with, the second semester was comprised by five groups; the fourth semester was comprised by four groups; and the sixth semester by four groups (Table 1).

In relation to the education average of the students, the mean was 86.31, *SD*= 5.58, and a range of values of 60 as minimum up to 97 as maximum. In regard to the student's status 84.6% (*f* = 126) mentioned to be regular students, while 15.4% (f = 23) was composed by irregular students. It was found that 77.9% (*f* = 116) are not engaged in any remunerated activity, and 22.1% (*f* = 33) do carry out a remunerated activity.

Concerning the general objective, a satisfaction mean of 81.52, *SD*= 12.55, was found with the use of clinical simulation laboratory; this represents that 56.4% of students are very satisfied (Chart 2).

The 75.1% of the students considered that the use of clinical simulation is a useful teaching method. 51.6% considered that the clinical simulation contributed to the development of theoretical and practical skills, a situation that increases security and confidence for 40.9% of the students when carrying out procedures. Besides, 46.3% mentioned that the training of teachers is adequate; 48.9% found it easier to prioritize nursing care after the clinical simulation sessions (Table 2).

The reliability of the instrument called Questionnaire of Satisfaction with the Clinical Simulation Classroom for the present research, estimated according to the Cronbach's alpha coefficient or index, was .912. For the inferential statistical analysis, the normality of data through the Kolmogorov-Smirnov test was considered, and it was found that the variables do not come from a normal distribution (*p*= .002).

Concerning the relationship between the variables of sex and level of satisfaction, a non-parametric Mann-Whitney's U test was used without finding statistically significant differences (*p*=.563). The satisfaction means were similar among the variables of ethnic group and level of satisfaction; however, such differences were not statistically significant (*p*=.427). In order to establish the relationship between the variables of semester and level of satisfaction the Kruskal-Wallis test was used, where significant differences were found among the groups (*p*=.000). The satisfaction mean was greater in the second semester and lower in the sixth semester (Table 3).

Concerning the relationship between the variables of student's status and level of satisfaction, the Mann-Whitney's U test was performed without finding statistically significant differences (*p*= .060).

In relation to the comparison between the variables of place of origin and level of satisfaction, Mann-Whitney's U test was performed without finding statistically significant differences (*p*= .621).

In relation to the comparison between the variables of engaged in a remunerated activity and level of satisfaction, the Mann-Whitney's U test was performed, where significant differences were found among the groups (*p*= .041).

DISCUSSION

The average age was 20.66 years, which matched with what was found in related researches that mention that the age of university students ranged between 20 and 22 years. 4 This may be attributed to the fact that each time there are more students who enroll in universities to have their bachelor's degree as soon as they finished high school studies.

Concerning sex, it was seen that the majority of students are women, matching similar studies where it is mentioned that Nursing has been considered a predominantly female profession [10].

In regard to the place of origin, it was found that most of the students are from the locality, which may be attributed to the fact that it is currently difficult that young adults move from rural areas to urban zones, and few students decide to move to another city to study, due to the financial effect this

Table 1. Frequency and percentage of students per semester and group.

Semester	*f*	%
Second (low complexity)	15	10.1
	9	6.0
	12	8.1
	7	4.7
	9	6.0
Fourth (medium complexity)	15	10.1
	13	8.7
	10	6.7
	12	8.1
Sixth (high complexity)	14	9.4
	17	11.4
	7	4.7
	9	6.0
	149	100.0

Source: Own development ***n* =** 149

might have on their families, aside from the fact that there are universities in the rural areas of the State of Sonora, such as the Universidad de la Sierra, for example [11].

Concerning the fact of belonging to an ethnic group, the results showed that a small percentage of students belong to an ethnic group, which matches the report in related studies where it is shown that low percentage figures of native students are enrolled in higher education. This may be related to the marginalization, including discrimination and low economic resources, which is currently found among ethnic groups in Mexico [12].

Regarding the education average, the result obtained was an average of 86.31, which is related to figures obtained in related studies that have taken place in Mexican universities. These values may be attributed to the fact that institutions increasingly seek to improve their teaching staff, infrastructure, and educational programs, which has a favorable impact on school performance [13].

In accordance to the engagement in a remunerated activity, it was found that most of the students do not work; this result differs from the results obtained in other studies where it is shown that the majority of students work during their university career, which may be attributed to the level of commitment that the Bachelor's Degree in Nursing demands from its students, together with the academic load that limits the free time among the courses [14].

When analyzing the result regarding the level of general satisfaction with the use of clinical simulation, it was found that nursing students have, on average, a high satisfaction, which is similar to that presented in other researches. In this sense, we could argue that this result comes from students who are satisfied with the career they chose, so the infrastructure, teaching staff, and curriculum are satisfactory [5].

Regarding the establishment of the relationship between the variables of sex and level of satisfaction, it was found that there are no differences between the two groups; this is consistent with related studies where sex does not influence the perception of satisfaction. This could be attributed to the fact that students, irrespective of their sex, receive the same opportunities [15].

In relation to the comparison between the variables of ethnic group and level of satisfaction, it was obtained that there is no dependence between either belonging to an ethnic group or not, since the level of satisfaction was similar in both cases; this differs from findings found in other studies, where it is mentioned that the perception we have about reality is conditioned by influential factors such as culture, race, etc. The findings found in this research may be insignificant in relation to others because there the number of students with this characteristic was not relevant [16].

Regarding the relationship between the variables semester and level of satisfaction, it was found that there is a difference between the groups since the students from the second semester are more satisfied, followed by the students in the fourth semester, and the students in the sixth semester are the less satisfied. This result does not agree with those obtained in similar researches, since they

Table 2. Level of satisfaction with the clinical simulation in accordance to each item of the instrument

Statement	*f* (%)				
	Very Disagreeable	**Disagreeable**	**Indifferent**	**Agreeable**	**Very Agreeable**
1. Simulation is a teaching method useful to learning.	1 (0.6%)	0 (0%)	0 (0%)	36 (24.1%)	112 (75.1%)
2. The scenarios where simulation takes place are realistic.	1 (0.6%)	12 (8.0%)	27 (18.1%)	87 (58.3%)	22 (14.7%)
3. The experience with simulation has improved my technical skills.	1 (0.6%)	1 (0.6%)	5 (3.3%)	65 (43.6%)	77 (51.6%)
4. Simulation helps to develop critical reasoning and decision making.	1 (0.6%)	3 (2.0%)	8 (5.4%)	70 (46.9%)	67 (44.9%)
5. Simulated cases are adapted to my theoretical knowledge.	0 (0%)	3 (2.0%)	6 (4.0%)	73 (48.9%)	67 (44.9%)
6. The experience with the simulator has increased my sense of security and trust.	1 (0.6%)	5 (3.3%)	22 (14.7%)	61 (40.9%)	60 (40.9%)
7. Simulation has helped me to integrate theory and practice.	1 (0.6%)	2 (1.3%)	7 (4.7%)	63 (42.2%)	76 (51.0%)
8. Workshops with the simulator have motivated me to learn.	1 0.6%	1 (0.6%)	11 (7.3%)	66 (44.3%)	70 (46.9%)
9. In simulation, it is useful to see our own recorded performance.	2 (1.3%)	4 (2.6%)	35 (23.4%)	70 (46.9%)	38 (25.5%)
10. The duration of the case is adequate.	1 (0.6%)	23 (15.4%)	26 (17.4%)	70 (46.9%)	29 (19.4%)
11. The teacher's training is adequate.	1 (0.6%)	4 (2.6%)	5 (3.3%)	70 (46.9%)	69 (46.3%)
12. Simulation fosters communication among team members.	0 (0%)	4 (2.6%)	16 (10.7%)	59 (39.6%)	70 (46.9%)
13. Clinical simulation helps to prioritize nursing care.	1 (0.6%)	1 (0.6%)	12 (8.0%)	62 (41.6%)	73 (48.9%)
14. The integration with simulation has improved my clinical competence.	1 (0.6%)	1 (0.6%)	16 (10.7%)	61 (40.9%)	70 (46.9%)
15. In general, the experience with clinical simulation has been satisfactory.	1 (0.6%)	0 (0%)	14 (9.4%)	71 (47.6%)	63 (42.2%)

Source: Own development ***n =*** 149

Table 3. Level of satisfaction per semester

Variable	Semester	*N*	Mean	*SD*	Median
Level of satisfaction	Second	52	86.3	10.2	86.6
	Fourth	50	81	14.8	85
	Sixth	47	76.6	9.9	75

Source: Own development ***n*** = 149

report that the semester does not have an impact on the satisfaction of the student. However, the difference between these results is found in the theoretical-practical nature of Nursing, for which reason being a newly enrolled student and having close contact to the practices of clinical simulation, positively stimulates the level of satisfaction with respect to the use of the laboratory. As the semesters progress, these practices decrease, so the students lose contact with the simulated procedures, since they start real practice [17].

With respect to the establishment of a relationship between the variables student's status and level of satisfaction, no differences were found between regular and irregular groups; this result does not agree with what was obtained in other studies, where it is shown that the student's status does have an impact on the highly positive satisfaction level that the student will have. This can be attributed to the fact that at this time students may improve their academic condition in a short time due to the fact that the possibility of retaking courses that have a high failure rate is expanded, as a strategy of the Nursing Department to contribute to the completion of the university career [18].

In relation to the comparison between place of origin and level of satisfaction, it was found that there is no relationship between both variables. This result agrees with results reported in related studies where it is shown that the place of origin does not have an influence either on the level of school satisfaction or on the academic performance. This finding could be related to the fact that personal motivation and the desire to excel are determining factors that have the same influence on local students or students from other towns [19].

CONCLUSIONS

The results obtained in the present research allowed establishing the level of satisfaction experienced by the students enrolled in the Bachelor's Degree in Nursing of the University of Sonora with respect to the use of clinical simulation.

The level of satisfaction obtained was within a high or very satisfactory range; it does not have a relationship with the variables of sex, ethnic group, academic status, and place of origin, while there is a statistically significant relationship with the semester of study and the fact that the student is either engaged in a remunerated activity or not.

CONFLICTS OF INTERESTS

The authors affirm that there are no conflicts of interests.

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