护理杂志 The Journal of Nursing

Volume 70 Number 5

Students' Perception of High-Fidelity Simulation Experience as an alternative to Clinical Placement During Undergraduate Study: Qualitative Study

[*]Ms. Kholoud Najeh Alharbi, MSN, [#]Dr. Sami Abdulrahman AlhamidI, RN, PhD

[*]*Teaching Assistant, Nursing Administration, and Education Department, College of Nursing, King Saud University, Riyadh, Saudi Arabia*

[#]*Assistant Professor, Maternal and Child Health Nursing Department, College of Nursing, King Saud University, Riyadh, Saudi Arabia*

Abstract

A. Background: *Simulation in nursing education has been used for more than 20 years (Au, Lo, Cheong, Wang, & Van, 2016). Simulation is defined as "an imitation of some real thing, state of affairs, or process" (Rosen, 2008, p.1). Nursing schools have been introducing simulation activities with their students to improve their knowledge and skills. It prepares them for real clinical practice (Waldner & Olson, 2007). However, more research studies need to be done to explore nursing students' perception of high-fidelity simulation experience compared to clinical placement for learning nursing skills.*

B. Aim: *This study aims to explore the perception among Saudi Arabian nursing students of high-fidelity Simulation (HFS) experience. Kolb's theory was used to guide this study since students can give a reflection and perception toward their simulation experience.*

C. Methods: *the design of the study was a qualitative study. A purposive sampling of 10 nursing students who are enrolled in a clinical study course at King Saud University. Aguided interview with open-ended questions was used to gather data. Ethical consideration was taken. Content analysis was used to analyze the data.*

D. Results: *Two main themes were emerged: "appreciation" and "non-appreciation."*

E. Conclusion: *the findings of this study provide valuable insights regarding the students' perception of high-fidelity simulation experiences instead of clinical placement as they can contribute to nursing education.*

Implications for nursing management: nursing managers can use Simulation in nursing practice, especially with the new staff, to develop and improve their skills to achieve high-quality care.

Keywords: *Simulation, nursing students, perception, clinical placement*

Students' Perception of High-Fidelity Simulation Experience as an alternative to Clinical Placement during Undergraduate Study

I. INTRODUCTION

Simulation in nursing education has been used for more than 20 years (Au, Lo, Cheong, Wang, & Van, 2016). It is highly successful at meeting demands created by increasing student enrollment, faculty shortages, and limited clinical sites that are experienced by faculties of nursing (Schoening, Sittner, & Todd, 2006). A variety of organizations and institutions, such as The Carnegie Foundation of Advancement of Teaching, recommend this teaching method because it is an effective educational strategy (Benner, Sutphen, Leonard, & Day, 2010). One of its main advantages is enhancing critical thinking and basic skills among nursing students in a safe environment (Waldner & Olson, 2007).

Simulation is defined as "an imitation of some real thing, state of affairs, or process" (Rosen, 2008, p.1). Nursing education refers to many activities that use patient simulators, including devices, virtual environments, and role- playing (Kim, Park, & Shin, 2016). The Simulation was started during World War II by two mathematicians: "Jon Von Neumann and Stanislaw Ulam," when they decided to use computer simulation until they reached an outcome regarding the neutron problem (Goldsman, Nance, & Wilson, 2009). In 1969, a conference was conducted to apply Simulation to the healthcare system, and since then, it was being used in many schools. The Simulation had been used in different fields such as military, healthcare, and education

because it is very effective and not as costly as other methods (Goldsman, Nance, & Wilson, 2009).

II. PROBLEM STATEMENT

Nursing schools have been introducing simulation activities with their students to improve their knowledge and skills. It prepares them for real clinical practice (Waldner & Olson, 2007). However, more research studies need to be done to explore nursing students' perception of high-fidelity simulation experience in comparison to clinical placement for learning nursing skills.

III. THE PURPOSE / RESEARCH OBJECTIVES

The purpose of this study is to explore the perception among Saudi Arabian nursing students of high- fidelity Simulation (HFS) experience. The research objective is to recognize the student feelings toward HFS and understand student experiences and the HFS from their viewpoints.

IV. RESEARCH QUESTION

The following is the research question that will be addressed in this study: what are the impressions of nursing students with their high-fidelity simulation experience in the clinical study course?

V. THEORETICAL FRAMEWORK

In 1984, Kolb established his Experiential Learning Theory, which is abbreviated as "ELT" (Waldner & Olson, 2007). Kolb's Theory is composed of four main constructs, which are: "concert experience", "reflective observation", "abstract conceptualization", and "active experimentation" (McLeod, 2017, p. 1). These four concepts are the core of the learning cycle and start with any of these concepts, but the most coming starting point is with real experience (Toolshero, 2019). So, the learning process will start when the person had an experience, and here the experience is a simulation. This will lead to the second step, which is the learner's reflection on that experience (Simulation). In the third step, the learner's reflection will be conceptualized and integrated into a cognitive framework. Fourth step, here, the learner will apply this cognitive framework into a new experience where again the experience is gained, reflected, and conceptualized. The learning process is continuous through this cycle and may be repeated (Waldner, & Olson, 2007). This theory was used to guide this study since students can give a reflection and perception toward their simulation experience.

VI. LITERATURE REVIEW

The significance of Simulation in the nursing field has been mentioned in the literature. Many research studies revealed that Simulation develops students' knowledge, critical thinking, confidence, problem-solving skills, and decision-making skills. In 2015, a study conducted by Shin, Ma, Park, Ji, & Kim was conducted on 237 students from three universities in Korea (A, B, C). Students from schools A, B, and C experienced 1, 2, and 3 experiences, respectively. The groups' critical thinking scores were 2.45, 1.50, and 0.66 for schools A, B, and C, respectively (Shin et al., 2015). Silvia (2013) conducted a qualitative study and found that 78.5% of students felt that HFS activities could increase critical thinking skills.

Weatherspoon, Phillips, and Wyatt (2015)conducted a study on 117 nursing students in an undergraduate nursing program to explore the effects of Simulation on clinical judgment skills. The results revealed that the clinical judgment skills of nursing students could be enhanced after the simulation experience. In another study that was done by Fawaz & Hamdan-Mansour in 2016, the clinical judgment scores have been improved from 22.1 (control group) to 29.5 (intervention group) and the motivation scores from 161.6 (control group) to 198.6 (intervention group) among nursing students after simulation sessions. In another study by Silvia (2013), 64% of nursing students reported that Simulation enhanced their skills.

Au et al. (2016) studied undergraduate nursing students in Macau. The findings revealed that more than 70 % of the students had a positive attitude toward the simulation experience because they felt it enhanced their knowledge and self-confidence. In another study by Gamble (2017), 28 nursing students believed simulation sessions helped them improve their problem-solving and decision- making skills when critical medication errors and some medical complications were used as a learning experience.

Blum & Parcells (2012) suggest that Simulation may enhance patient safety since it allows students to practice in a safe environment before practice on living persons. For example, 95% of nursing students in an inquiry by McCaughey & Traynor (2010) felt that Simulation might enhance patient safety by reducing the number of mistakes made by students and indicated their intention to apply the skills that they had learned in simulation sessions to clinical practice. Nursing students reported that medication administration competence had been improved after simulation sessions (Jenkins, Akman, Astroth, Pohl, & Jacobs, 2018).

Further studies have identified that nursing students have positive attitudes toward Simulation because they felt it would enhance the multidisciplinary team's self-efficacy and competence, contributing to effective care planning and delivery, reduced errors, and ultimately improving patient safety (Vawser, 2015). Reduced error rate helps in increasing their commitment as well as self-esteem, which contributed significantly to improving satisfaction and reducing the stress level. Parry and Fey (2019) reported that simulation training reduces the self-reported stress level among first-year nursing students.

Overall, it is obvious from the previous literature reviews that simulation experience has many advantages and positive effects on nursing students since it enhances their

critical thinking, problem-solving, clinical decision-making, self-confidence, and skills. With thorough simulation experience, nursing students will be prepared for real future practice, and they will provide safe and high-quality care to their patients.

VII. METHODOLOGY

A. Study Design

The design of the study was a qualitative study. A guided interview with open-ended questions was used to gather data. The type of interview is the focus group semi-structured interview. Individual interviews with some students were conducted as they requested. This design was selected because it explores thoughts and opinions regarding the experiences of the population. In this study, the perception among nursing students of high-fidelity Simulation (HFS) experience during clinical placement was examined.

B. Study Duration

The study was conducted after taking the IRB approval from the committee for 5 weeks as following:

- 2 weeks for data collection.
- 2 weeks for data analysis and results.
- 1 week for discussion and conclusion.

C. Setting

The study was conducted at Nursing College at King Saud University, Riyadh, Saudi Arabia. This study was implemented between March 1 and March 20, 2020.

D. Target population:

Male and female undergraduate nursing students enrolled at King Saud University.

E. Sample size: The sample size was 10 nursing students, 2 females and 7 males.

F. Sampling

- A purposive sampling (non-probability sampling) of 10 nursing students enrolled in a clinical study course at King Saud University.
- Students attended two simulation sessions, which were requirements in their clinical study course.
- Interview with open-ended questions was conducted afterward.

G. Inclusion Criteria

To be eligible for this study, students should be enrolled in a clinical undergraduate course.

H. Exclusion Criteria

Nursing students who were under 19 years old and students who did not volunteer to participate in the study.

VIII. RESEARCH VARIABLES

- Dependent variable: students' perceptions
- Independent variables are demographic data and students' previous work experience

Definitions:

A. Students' Perception

a) Conceptual Definition:

"Perception can be defined as our recognition and interpretation of sensory information" (Brent, 2018, p. 1)

b) Operational Definitions

Nursing students' recognition toward simulation experience and will be measured by the "Simulation Evaluation Form" developed by Pinar et al., 2015.

B. Demographic Data

a) Conceptual Definition:

"The statistical characteristics of human populations" (Merriam-Webster, 2019, p.1)

b) Operational Definition:

Gender, age, history of employment in a clinical setting, and previous experience with patients similar to the cases encountered in the simulation experience.

IX. TOOL / PROBING

A tool that consists of two parts to cover the objectives of the study; the first part includes demographical data such as age, gender, history of employment in a clinical setting, and previous experience with patients that are similar to the cases that are encountered in the simulation experience.

The second part is open-ended questions developed by Au et al. (2016) to assess the perception of nursing students toward utilizing high fidelity simulation to gain clinical skills instead of clinical placement was posed to the students after the HFS experience. Some modifications were made, and some questions were added. The questions are (Au et al., 2016):

1. Tell me your opinion on using high-fidelity simulation activity used during the clinical study course?
2. What are the advantages of using high-fidelity simulation activity?
3. What are the disadvantages of using high-fidelity simulation activity?
4. What are your feelings during simulation sessions?
5. What did you gain from high-fidelity simulation activity?
6. What did you lose from the high-fidelity simulation activity?
7. What are the inconveniences that you encountered during the simulation sessions?
8. What is your suggestion for high-fidelity simulation activity?

X. DATA COLLECTION

Ethical approval was obtained from the committee at King Saud University. The aim of the study was explained to the participants by the researcher. Data collection required 2 weeks to be completed. Students had 2 simulation sessions, which were part of their clinical study course that was designed by faculty. After completing the simulation sessions, the students had an interview lasting for 20 to 30 minutes. The interview was composed of two parts. The first part was the demographic data, and the second part wasopen-ended questions that focused on the students' perceptions of simulation experience. 10 students who were enrolled in the course knew that their participation in the study was voluntary. All interviews were recorded and saved for later analysis.

XI. ETHICAL CONSIDERATION

- The proposal was submitted to the IRB committeeat King Saud University for Approval.
- Ethical approval was taken from Humanities IRB at King Saud University, Ref No: KSU-KSU-HE-19-534.
- Informed consent was obtained from all participants for agreement about their participation through email.
- Participants were informed that participation was voluntary.
- Participants had the right to withdraw from the study if they want
- Confidentiality was conducted (no one has access to the information).
- Recordings were saved in the computer that is protected by a password

XII. DATA ANALYSIS

Content analysis was used to analyze the data. Coding was obtained from subjects' words by breaking down the content into smaller units. Then, they were categorized, and themes were developed by grouping the coded material (Polit & Beck, 2016) (Table 1).

TABLE 1

Example of Content Analysis:

Participants Sentences (example)	**Code**	**Category**	**Themes**
"I think it is a nice experience and enjoy study and help us understand the course."			Appreciation
"You can get more experience."	Experience	Good preparation and activity for improving the skills and practice	
"Knowledge and it has critical thinking and good practice for us."	Knowledge and critical thinking	Resourceful and improvement of critical thinking	
"You have confidence, and you will be able to practice easier and to learn step by step."	Confident	Becoming confident to practice easily.	

XIII. STUDY RIGOR

The study's trustworthiness was ensured by applying the four criteria developed by Lincoln and Guba (1985): credibility, transferability, dependability, and confirmability (Polit, & Beck, 2016). Credibility refers to theinternal validity; transferability refers to generalizing; dependability refers to reliability; confirmability refers to objectivity; (Shenton, 2004). In this study, credibility and confirmability were ensured by giving back the themes to the students to confirm the results (member checking). Regarding dependability and transferability, they were ensured by describing the process of data collection and settings (Polit & Beck, 2016).

XIV. RESULTS

A. Demographic:

There were 10 undergraduate nursing students who were participated in this study. 7 males and 2 females. The age of participants was from 20 to 24. All students are single.Four students were in level 8. Six students were in level 6. All students had previous simulation experience with different clinical courses. Nine of the participants didn't have

real clinical experience or previous employment in a clinical setting. One of the students has clinical experience at Al Habib hospital. Two main themes emerged from the participants' scripts.

B. Appreciation:

Undergraduate nursing students had two simulation sessions instead of clinical placement. The students appreciated high fidelity simulation even though they had this experience before with other courses in previous study levels. The students revealed that Simulation has a goodatmosphere to gain knowledge and more practice and training. All students have appreciated the simulation activity during the clinical course. Four categories: “positive feelings," “resourceful and improvement of the critical thinking," "good preparation, and activity for improving the skills and practice," and “becoming confident to practice easily” were under the theme "appreciation."

C. Positive Feelings

There were 70% of undergraduate nursing students who exhibit that they have positive feelings toward simulation experience. They used words such as "good," "enjoyable," "perfect," "important," and "interesting," which indicates that students have positive feelings toward the simulation experience.

Student 1:

"I see that simulation is interesting."

Student 4:

"It is a perfect experience."

Student 6:

"I think it is important."

Student 7:

"I think the simulation activity is good because it shows you everything you have learned."

Student 8:

“*I think it is a nice experience and enjoy study and help us understand the course."*

Student 10:

“Simulation is good and helps me to understand."

Resourceful and Improvement of Critical Thinking

Undergraduate nursing students revealed that they get “knowledge” and having practice on their “critical thinking” abilities from the simulation experience. This indicates that undergraduate nursing students have a positive perception of the high fidelity simulation experience. The following were the students' responses toward question 2, which focus on the advantages of Simulation:

Student 2:

“You can get Knowledge from simulation, and your practice will be improved."

Student,3:

“*It helps me understand the course."*

Student 4:

“It will improve your knowledge because when you see something is not like you read or write”

Student 7:

"It ensures the students understand the concepts ensure course, and it makes it easier to imagine the case during the study."

Student 8:

"I gain a clear and full understanding."

Student 10:

“Knowledge and it has critical thinking and good practicefor us."

Good preparation and Activity for Improving the Skills and Practice

Most undergraduate nursing students revealed that they have a “good preparation” and an improvement in “kills and practice” from the simulation experience. This indicates that undergraduate nursing students have a good perception of the high fidelity simulation experience.

Student 1:

"It will cover most of the clinical situations because whenyou go to the hospital or any medical care facility, you will not get all the information then."

Student 3:

"You can get more experience."

Student 4:

"You can see the hospital routine or how you work as a nurse."

Student 6:

“More practice and it has a safe learning environment."

Student 7:

"I believe it addresses the gap in clinical conditions setting."

Student 8:

“*We learn from practical, better than theoretical, which is obvious."*

Student 10:

"Well, I gain how to do the procedure and the methods and the ways of doing it in a better way."

Becoming confident in practice easily.

Students are becoming confident after several practices in the simulation lab. One student revealed that Simulation increases his confidence since he learns and practices the procedure step by step.

Student 2:

"You have confidence. You will be able to practice easier and learn step by step."

Another student said:

Student 4:

"Maybe for the first time, you will be like a scare, you will be scared of hmm because it is a new environment, so maybe in one week, you will be cool with that, you will do your job, and you will do your job be confident."

Another student added:

Student 6:

"It should begin in the first classes in nursing like the third or fourth because you will be able to learn and have confidence and believe in yourself."

Student 7:

"I feel I am confident because I learn and practice more and more in a lab."

D. Non-Appreciation:

There are only two students who believe that real clinical practice is better than Simulation since the student has a real patient. There are three categories: "lack of the essential equipment," "lack of a sufficient number of instructors," and "lack of reality" were under the theme "non-appreciation."

Lack of the Essential Equipment

Two students believe that the simulation lab doesn't have the essential equipment that existed in real clinical settings. They think that Simulation is not beneficial to them since it doesn't have all the necessary equipment.

Student 5:

"Simulation labs do not have all materials, and we cannot find all materials we need for all procedures. How it is helpful!!"

Student 9:

"Simulation is not beneficial because it misses the necessary equipment."

Lack of Sufficient Number of Instructors

Students believe that there was no sufficient number of instructors to provide simulation sessions. The number of students attending the simulation lab was very high, and with some courses, it is difficult for them to practice more than once. This is the inconvenience that they encountered during the simulation experience.

Student 5:

"Providing more instructors to reduce the number of students in each simulation activity makes me practice more than once."

Student 9:

"Simulation does not have a lot of teachers. I suggest having more faculty to reduce the number of participants."

Lack of Reality

The two students believe that Simulation doesn'thave the reality that can be encountered in a real clinical setting. They revealed that it is difficult to figure out how patients think and how they should react to them without knowing how they feel.

Student 5:

"For me, the difficult thing is that person will not get to feel or see how the patient thinks and how he will react to."

Student 9:

"I believe simulation is not very helpful because of no reality as we do in the hospital."

XV. DISCUSSION

In nursing education, high fidelity simulation is used to enhance the learning of undergraduate nursing students during studying their clinical course (Au et al., 2016). This study aims to explore the perception among Saudi Arabian nursing students of high-fidelity Simulation (HFS) experience. In this study, two themes were emerged, which are "appreciation" and "non-appreciation." There following four categories: "positive feelings," "resourceful and improvement of the critical thinking," "good preparation and activity for improving the skills and practice," and "becoming confident to practice easily" were under the theme "appreciation." Moreover, three categories: "lack of the essential equipment," "lack of a sufficient number of instructors," and "lack of reality" were under the theme "non-appreciation."

These categories were supported by Kolb theory (1984), which is called Experiential Learning Theory (Waldner, & Olson, 2007), which reveals that students will have the confidence, knowledge, critical thinking abilities, and improvement in practice after experiencing simulation activity through a continues learning cycle. This cycle starts with a simulation experience moving to feedback and reflection from instructors, students themselves, and colleagues, then to critical thinking skills, and finally to

practice in a confidant manner. This cycle is continuous and may be repeated. Through this learning cycle, undergraduate nursing students can reflect and perceive their simulation experience (Waldner & Olson, 2007). Here, students have been provided a perception of simulation activity as either “appreciation” or "non-appreciation."

In this study, 85% of undergraduate nursing students appreciated the simulation experience, and they pointed to it as a "resourceful experience." The findings of this study are similar to a study performed by Au in 2016, who revealed that nursing students looked at simulation experience as a resourceful activity since it achieves the learning objectives of the clinical course. Moreover, many studies showed the findings as "critical thinking," "good preparation," "skills and practice," and "confidence." A studydone by Al-Najjar, Beer, & Elarousy (2019) explores the experience of nursing students in Simulation. In that study, students revealed that Simulation eased critical thinking, built self-confidence, improved practice and skills, and prepared them for clinical practice.

Also, in this study, two undergraduate nursing students didn't appreciate simulation experience, and they revealed that Simulation is not helpful as it has a "lack of the essential equipment," "lack of a sufficient number of instructors," and "lack of reality." These findings are similar to another study done by Baddar (2019) to explore the perceptions of nursing students toward Simulation. Nursing students reported that Simulation has a lack of reality and a shortage of equipment. Moreover, many studies showed that Simulation needs a sufficient number of nursing staff to address the huge number of nursing students (Richardson et al., 2014; Aebersold, 2018).

XVI. IMPLICATIONS, LIMITATIONS, AND RECOMMENDATIONS

The implication is that the findings of this study provide valuable insights regarding the students' perception toward high fidelity simulation experiences instead of clinical placement as they can contribute to nursing education. Nursing staff should be aware of teaching methods such as Simulation that can be used to achieve the clinical course objectives. These findings can enhance the use of simulation experience to have an effective nursing education system. One of the limitations of this study is the "Selection of subjects." In this study, the sampling type is purposive, nonrandom, or nonprobability and affects the generalizability of the findings. Another limitation is that there are factors other than Simulation like previous work experience, which might affect the students' perception, making the generalizability limited. The recommendation is that replication by further research studies with mixed or quantitative methodologies should be done to have a larger sample size.

XVII. CONCLUSION

High-fidelity simulation has been highly used in nursing schools. In this study, undergraduate nursing students’ perceptions toward Simulation were explored. Two main themes emerged, which are "appreciation" and "non-appreciation." Impressions from undergraduate nursing students regarding advantages, disadvantages, and difficulties encountered during the simulation experience were explored. Nursing faculty need to use these perceptions or impressions to improve the simulation experience to have more structured instruction that meets the nursing students' learning needs.

XVIII. CONFLICT OF INTEREST

None to declare.

XIX. ACKNOWLEDGMENT

I would like to thank my instructor for his support and advice during this research.

REFERENCES

[1] Al-Najjar, H., Beer, J., & Elarousy, W., Exploring the experiences of nursing students in clinical Simulation: A qualitative study, (2019). Retrieved from https://www.idosi.org/wjms/16(2)19/4.pdf

[2] Aebersold, M., Simulation-based learning: No longer a novelty in undergraduate education. OJIN: The Online Journal of Issues in Nursing, 23(2) (2018). Retrieved from https://ojin.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol-23-2018/No2-May-2018/Articles-Previous-Topics/Simulation-Based-Learning-Undergraduate-Education.html

[3] Au, M. L., Lo, M. S., Cheong, W., Wang, S. C., & Van, I. K. Nursing students' perception of high-fidelity simulation activity instead of clinical placement: A qualitative study. Nurse Education Today, 39 (2016) 16-21. DOI:10.1016/j.nedt.2016.01.015

[4] Baddar, F., Abdulrahman, N., Mhawish, H., & Salem, O. A. Exploring nursing students' perception of high-fidelity practices: A phenomenological study. Clinical Medicine Research, 8(4) (2019) 69. doi=10.11648/j.cmr.20190804.11

[5] Benner, P., Sutphen, M., Leonard, V. & Day, L. Educating nurses: A call for radical transformation. Washington DC: Carnegie Foundation, (2010).

[6] Brent, S., What is the perception of psychology? - definition & theory, (2018). Retrieved from https://study.com/academy/lesson/what-is-perception-in-psychology-definition-theory-quiz.html

[7] Blum, C. A., & Parcells, D. A., Relationship between high-fidelity Simulation and patient safety in prelicensure nursing education: A comprehensive review, Journal of Nursing Education, 51(8) (2012) 429-435.

[8] Cantrell, M. L., Meyer, S. L., & Mosack, V., Effects of Simulation on nursing student stress: an integrative review, Journal of Nursing Education, 56(3) (2017) 139-144. DOI: 10.3928/01484834-20120523-01

[9] Fawaz, M. A., & Hamdan-Mansour, A. M., Impact of high-fidelity Simulation on the development of clinical judgment and motivation among Lebanese nursing students, Nurse Education Today, 46 (2016) 36-42. DOI:10.1016/j.nedt.2016.08.026

[10] Global Media Insight. (2019). Saudi Arabia’s population statistics of 2019. Retrieved from https://www.globalmediainsight.com/blog/saudi-arabia-population-statistics/

[11] Goldsman, D., Nance, R., & Wilson, J., A brief history of Simulation, (2009). Retrieved from https://www.informs-sim.org/wsc09papers/028.pdf

[12] Jenkins S., Akman O., Astroth K.S., Pohl C., Jacobs P.J., Effect of Simulation on nursing students' medication administration competence. Clinical Simulation in Nursing, 14 (2018) 3-7. DOI: 10.1016/j.ecns.2017.08.001
[13] Kim, J., Park, J. H., & Shin, S., Effectiveness of simulation-based nursing education depending on fidelity: a meta-analysis. BMC Medical Education, 16(1) (2016) 152.
[14] Knoesel, J., Effect of implementation of Simulation on critical thinking skills in undergraduate baccalaureate nursing students, (2017). Retrieved from https://pdfs.semanticscholar.org/eec7/9f614fc661d235b4a688a186d17b06333b9d.pdf
[15] McCaughey, C. S., & Traynor, M. K., The role of Simulation in nurse education. Nurse Education Today, 30(8) (2010) 827-832. DOI: 10.1016/j.nedt.2010.03.005
[16] McLeod, S., Kolb's learning styles and experiential learning cycle, (2017). Retrieved from https://www.simplypsychology.org/learning-kolb.html
[17] Merriam-webster. (2019). Skill. Retrieved from https://www.merriam-webster.com/dictionary/skill
[18] Merriam-Webster. (2019). Demographic. Retrieved from https://www.merriam-webster.com/dictionary/demographic
[19] Parry, M., & Fey, M. K., Simulation in Advanced Practice Nursing. Clinical Simulation in Nursing, 26 (2019) 1-2. DOI: https://doi.org/10.1016/j.ecns.2018.11.004
[20] Pinar, G., et al.,The effects of high fidelity simulation on nursing students' perceptions and self-efficacy of obstetric skills, International Arch Nurse Health Care, 1(1) (2015) 1-7.
[21] Polit, D. F., & Beck, C.T., Nursing Research: Generating and assessing evidence for nursing practice (10th ed.). Philadelphia: Lippincott Williams and Wilkins, (2016).
[22] Rosen, K. R., The history of medical Simulation. Journal of Critical Care, 23(2) (2008) 157–166. DOI: https://doi-org.sdl.idm.oclc.org/10.1016/j.jcrc.2007.12.004
[23] Richardson, H., Goldsamt, L. A., Simmons, J., Gilmartin, M., & Jeffries, P. R., Increasing faculty capacity: Findings from an evaluation of clinical simulation teaching, Nursing education perspectives, 35(5) (2014) 308-314. Retrieved from https://www.academia.edu/21032463/Increasing_faculty_capacity_findings_from_an_evaluation_of_simulation_clinical_teaching
[24] Schoening, A. M., Sittner, B. J., & Todd, M. J., Simulated clinical experience: Nursing students' perceptions and the educators' role, Nurse Educator, 31(6) (2006) 253-258. DOI: 10.1097/00006223-200611000-00008
[25] Socha, V., Socha, L., Szabo, S., Hanak, K., Gazda, J., Kimlickova, M., & Puskas, T., Training of pilots using a flight simulator and its impact on piloting precision, Proceedings of the International Conference, (2016) 5-7. DOI: 10.2514/6.2000-4286
[26] Shenton, A. K., Strategies for ensuring trustworthiness in qualitative research projects. Education for information, 22(2) (2004) 63-75.
[27] Silvia, S., Faculty Perceptions of Simulation on Student Learning for Safe Clinical Nursing Practice, Grand Canyon University, (2013(. DOI: 10.1177/0193945908328264
[28] Toolshero., David Kolb, (2019). Retrieved from https://www.toolshero.com/toolsheroes/david-kolb/
[29] Vawser, T., Simulation and patient safety: the benefits to your organization, (2015). Retrieved from https://www.researchgate.net/publication/275354730_Simulation_and_Patient_Safety_The_benefits_for_your_organisation
[30] Waldner, M. H., & Olson, J. K., Taking the patient to the classroom: Applying theoretical frameworks to Simulation in nursing education, International Journal of Nursing Education Scholarship, 4(1) (2007). DOI:10.2202/1548-923X.1317
[31] Weatherspoon, D., Phillips, K., & Wyatt, T., Effect of electronic interactive Simulation on senior Bachelor of Science in nursing students critical thinking and clinical judgment skills, Clinical Simulation in Nursing, 11(2) (2015) 126-133. DOI: https://doi.org/10.1016/j.ecns.2014.11.006