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Improving Senior Level Nursing Students' Application of Assessing and Managing Pain through a Virtual Game Simulation

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Pain through a Virtual Game Simulation

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Improving Senior Level Nursing Students' Application of Assessing and Managing Pain through a Virtual Game Simulation

Abstract

Senior nursing students in the last semester of a community college nursing program take the Health Education Systems Incorporated (HESI) Exit Exam to evaluate their ability to pass National Council Licensure Examination for Registered Nurses (NCLEX-RN). The objective of this project was to implement a virtual game simulation on pain assessment and management to improve scores related to the concepts of pain comparing two different cohorts. Senior nursing students were offered the virtual game simulation and could voluntarily report attempts and results through a Google ™ Form.

Keywords: pain simulation, virtual simulation, online serious gaming, virtual game

Improving Senior Level Nursing Students' Application of Assessing and Managing

Pain through a Virtual Game Simulation

Students in an Associate Degree of Nursing Program have received instruction on the concept of pain management including how to conduct pain assessments and interventions to implement in managing clients' pain. Throughout the program students are able to practice their skills in the clinical settings, however it has been noted graduates from the program still need further instruction on this concept. Students have scored below the benchmark on the Health Education Systems Incorporated (HESI) Exit Exam version I, which predicts students' performance on the National Council Licensure Examination for Registered Nurses (NCLEX-RN). Senior level student nurses need more practice conducting pain assessments and implementing treatment methods to enhance patient comfort and minimize suffering. This project aimed to increase the scores on the concepts of pain on the HESI Exit Exam I through the use of a virtual game simulation.

Needs Assessment

The needs assessment was completed by analyzing the previous cohort's HESI data, specifically data on pain management. Results from Spring 2020 students on average showed scores of 705 for pain and 785 on pain and suffering with a benchmark for these areas at 850 (HESI, 2020). According to University of North Carolina (UNC) Healthcare Hospital Consumer Assessment of Healthcare Providers and Systems (HCAPS) (2017) the local hospital rated pain control at 70%. Which is below both the North Carolina state average (72%) and the national average (71%) for HCAPS. In 2017 pain control was rated at the local hospital at 68% compared to 71% NC average and 71% for the national average for HCAPS (UNC Healthcare, 2018). A literature review

was completed prior to implementing a virtual game simulation to enhance student's knowledge on pain assessments and management. Articles reviewed indicated virtual simulations and serious gaming improved students' knowledge and application of related material (Romero-Hall, 2015; Verkuyl et al., 2017). According to Ramia et al. (2017), pain is suboptimally assessed and treated in acute care facilities and leads to negative effects on patient care and patient satisfaction. The National Institute of Drug Abuse reported 128 people die every day from opioid overdose and indicated better pain management is needed to decrease these rates (2020).

Demographics

Students in the Spring 2021 cohort represented a diverse student body between the ages of 21-50 with 21 female students and two male students. There was a combination of students both actively working in the clinical setting and those not actively working in the clinical setting. Certification as a Nursing Assistant I was a pre-requisite to entering the nursing program. The primary language for students in the cohort was English.

Aim

This project aimed to improve pain assessments and management of nursing students who were in their last semester of nursing school. This project focused on pain assessments and interventions a nurse can do to manage pain, pharmacologically and non-pharmacologically. This project was not anticipated to immediately improve patient satisfaction scores or community improvement of pain. This project aimed to impact the student nurse's HESI scores and ability to implement their knowledge through a virtual simulation scenario**.**

Implementation

The virtual game simulation was created in Microsoft PowerPoint ™ with
material from the textbooks students were assigned and based on the NCLEX-RN
blueprint. The virtual game simulation focused on acute pain in a client with appendicitis.
The game consisted of a client's room, electronic health record (EHR), and incorporated
the students selecting the correct medication prescribed to the client. The game began
with the student selecting to either receive report on the patient, visit the client, or view
the EHR. The EHR contained information on the client's admission, vital signs, labs,
medications, and active orders. Throughout the game the student was asked to answer
multiple choice questions for which they received immediate feedback on their choices.
The questions throughout the game only allowed one answer and there was no option for
"select all that apply". The student was required to answer each question based on the
information presented before progressing to the next question. At the end of the game the
students received a score with the maximum score of a 100. For correct answers students
received ten points and for incorrect answers five points were deducted. Students were
provided access to Microsoft Office ™ free of charge due to being a student, which
enabled them to download the game in Microsoft PowerPoint ™. The virtual game
simulation was then imported into a Google Form ™, which is also available to students
free of charge. The project was monitored for completion through Google Forms on a
weekly basis for eight weeks. Students were invited to participate in the project via email
link allowing the investigator to monitor number of students, number of attempts, and
highest score obtained. The virtual game simulation was offered to all students in the
cohort, reporting their attempts and results on the game was voluntary and had no impact

upon their overall average in the course. Students on average completed the virtual game simulation 1.29 times with the average score being 80.14. Students reported their results voluntarily and anonymously through the Google Form ™.

Threats and Barriers

Throughout the implementation phase of the project one of the major threats was related to the COVID-19 pandemic. Students had transitioned to a combination of virtual and in-classroom instruction since the pandemic. During the last semester of nursing school students are planning for graduation, preparing applications for NCLEX-RN, applying to their first nursing job, and completing the clinical focused experience. Students are managing families and jobs which creates additional time constraints. Students in the senior class have varied levels of experience using Google Workspace ™ and Microsoft Office ™. There were inquiries to the investigator on how to download the PowerPoint and some students had difficulty with placing the PowerPoint in "show mode" to play the game. Some students may have not completed the game due to the inability to download the game or place in show mode. Students' internet and download capability was another barrier considered during the implementation phase. Additionally, from the technology perspective of the instructor, there was no access to Safari ™ or MacBook ™ therefore, functionality of these programs could not be tested. The HESI Exit Exam I was originally planned to be delivered during April however, the exam was administered during the first week of February. This delivery date change gave students two months to practice with the game instead of the four months planned at the onset of the project. This may have also been a potential barrier to student performance on the concept of pain on the examination. On average, students only completed the virtual

game simulation 1.29 times, rather than repeating the game to apply new knowledge which may have also been a barrier in the final review.

Outcomes

The pain assessment and management virtual game simulation was offered to 23 senior level nursing students from Fall 2020 to Spring 2021 with seven students (30%) reporting their individual results for the game. The senior level class in the Spring of 2020 was composed of 30 students and did not have access to the simulation game serving as the independent variable. The dependent variable was the HESI Exit Exam I score on the concepts of pain. The concepts of pain and suffering as well as pain scores were compared from Spring 2020 to Spring 2021.

In analyzing the data from Spring 2020 cohort to Spring 2021 cohort the mean HESI score on the concepts of pain was 745 for Spring 2020 and 756 for Spring 2021. The standard deviation for Spring 2020 cohort was 56.57 and for the Spring 2021 cohort the standard deviation was 14.14. A standard t-test was used to determine the statistical significance of the data with a t-score value of 0.83. It was concluded that the null hypothesis was supported as the virtual game simulation had no significant effect on the HESI Exit Exam I scores.

Conclusions and Recommendations

The virtual game simulation implemented did not have a statistically significant effect on the HESI test scores for this cohort. The virtual game simulation was clinically relevant and reiterated material covered in the nursing program focusing on the concepts of pain. Virtual game simulations are beneficial in helping students connect knowledge to a clinically relevant situation. More research needs to be conducted and

evaluated on the effects of serious gaming and virtual game simulations on students

standardized testing performance.

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