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Pharmacology Summative Assessments in the AAS Nursing Curriculum

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Abstract

Introduction: The City of Chicago Associate Applied Science (AAS) nursing program curriculum does not offer a pharmacology course. In preparation for student's success on the National Council Licensure Examination Registered Nurse exam (NCLEX-RN), nursing faculty adopted web-based pharmacology contents, to provide additional support and to assist students in learning the concepts of pharmacology throughout the curriculum. At the end of the two-year program, the student's knowledge of pharmacology was assessed by administering two examinations: ATI-RN Pharmacology exam and ATI RN Comprehensive Predictor exam. If the students are passing the ATI Comprehensive Predictor exam which incorporates pharmacology, is it necessary to administer the additional ATI RN Pharmacology examination.

Purpose: The purpose of this research is to identify the effectiveness and relevance of administering both examinations to assess the student's knowledge of pharmacology content at the end of the nursing program.

Research questions: Does the ATI Pharmacology examination provide an accurate assessment of the pharmacology content? Do the results correlate with the students' performance on the ATI Comprehensive examination?

Methods: Nursing faculty participated in a one-hour meeting to discuss two cohort group scores of the two pharmacology summative assessments, read an excerpt and reviewed a video on summative assessment. A quantitative study was utilized to analyze the data.

Results: The results of the post aggregated scores identified that the ATI RN pharmacology exam scores had no significant effect on the student's performance on the pharmacology content on the ATI RN Comprehensive Predictor examination. There were two cohorts consisting of 37 students in the spring and 41 students in the fall semester. Both cohorts scored higher on the pharmacology content of the ATI RN Comprehensive Predictor examination.

Discussions: Faculty addressed two questions: Does the ATI RN Pharmacology examination provide an accurate assessment of the learned content? Do the ATI RN Pharmacology results correlate with the students' performance on the ATI RN Comprehensive Predictor examination?

Conclusion: The ATI RN Pharmacology examination results may not reflect student's knowledge of the content because the exam does not count toward program completion. Recommendations were to use the ATI RN pharmacology exam as a graded item or omit it as an additional assessment.

Nature of this Study

Nursing programs have profound differences as to how students are assessed. There are multiple assessment methods utilized throughout the curriculum to assess student's knowledge of contents. The assessments are used to measure progress or for screening purposes to determine who might need further assessment [1]. The results of these assessments may facilitate faculty to revise classroom and clinical instruction. The outcome of the assessments provide data which may impact students achieving end of the program student learning outcomes and successfully passing the National Council Licensure Exam For Registered Nurses (NCLEX-RN) [2].

Significance of the Research

The nursing program curriculum does not offer a separate pharmacology course. Nursing faculty adopted specific, relevant, web based, pharmacology software assists in teaching pharmacology content and medication dosage calculation for acute and chronic diseases throughout the curriculum. The curriculum incorporates a pharmacology learning platform that consist of evidence-based practice, educational theories, Bloom taxonomy, Maslow needs, and NCLEX-RN test plan. These platforms are part of the ongoing assessment through learning activities, clinical assignments, and course examinations. Faculty utilize competencies in nursing education to determine which assessments method will be used to determine student's pharmacology knowledge. At the end of the program, students are administered two additional summative examinations to measure pharmacology knowledge, the Assessment Technologies Institute (ATI) RN Pharmacology and RN Comprehensive examinations.

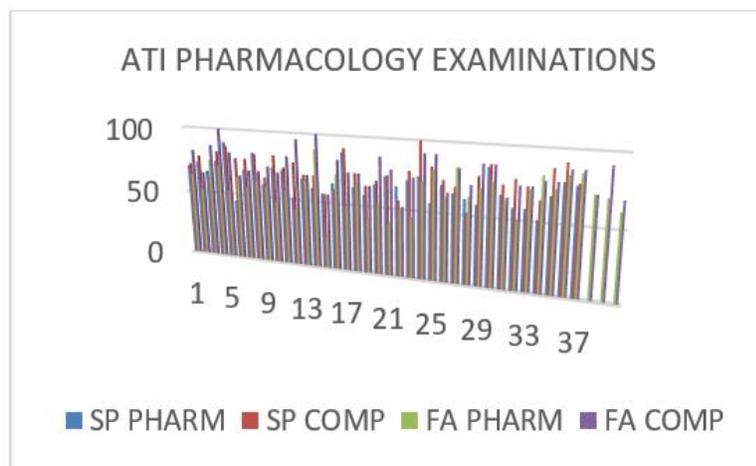


Figure 1: The differences of aggregated scores on ATI Pharmacology and Comprehensive examinations.

Literature Review

Evidenced-Based Practice

There are many evidenced-based practices strategies to teach content, but there is no literature review to identify the best teaching strategies [3]. Because of this, it is essential that faculty keep abreast of evidence-based practice strategies for implementing pharmacology content in a curriculum that does not offer a separate Pharmacology course.

Dosage calculations textbooks, other nursing programs pharmacology course objectives, and educational software are used to assist in developing pharmacology unit objectives. Due to the importance of pharmacology, the content is introduced in the first semester, fundamental nursing course. A detailed, online medication learning activities, skills laboratory practice, course examinations, and dosage calculations in classroom and clinical instructions are included in this course. In addition, similar activities and objectives are integrated in each course in the nursing program.

Educational Theories

The way students attain knowledge continues to evolve with most of the learning involving the use of technology that consists of uploaded documents, articles, audio, and video clips in the Learning Management Systems (LMS). This allows students to learn at any time or place [4].

The requirement of learning various learning systems can be difficult and overwhelming for some faculty. To reduce barriers of using adopted software and LMS, Kurt Lewis [5] Change Theory can be utilized as a framework to influence faculty adoption of various strategies to teach Pharmacology and to reassess its use.

Blooms Taxonomy

There are three levels of domains (cognitive, affective, and psychomotor) that can be used to learn pharmacological content. Cognitive domain involves integrating pharmacological content using some form of technology platform. The Learning Management System (LMS) allow students to post discussions of health conditions and medications associated with the diseases.

The affective domain interventions using moral and ethical principles can have a favorable impact on clients [6]. Prelicensure nurses are informed that nurses have accountability to the society. The standard of accountability through formal codes of ethics explicitly states the profession goals and values [7]. Moral and ethical responsibilities require nurses to have knowledge of pharmacological implications, effects, and contraindications before administering medications to patients.

Students are required to review assigned videos and demonstrate satisfactory psychomotor skills of administering medications using ATI resources. Prior to performing skills in the clinical environment, student's pharmacological knowledge and skills in the nursing laboratory are practiced and assessed.

Maslow

Safety is one of the essential components of Maslow's Hierarchy needs. Safety is threatened if students fail to demonstrate a sufficient knowledge of pharmacology content which can prevent medication errors. The Joint Commission on Patient's Safety Goal emphasizes the importance of communicating and verifying medications to prevent errors and duplications [8]. Fundamental courses focus on safe administration of medication by stating the rights of medication administration.

NCLEX-RN Test Plan

The National Council Licensure Exam-RN (NCLEX-RN) test plan is used as a guide for curriculum development and revisions. Since the curriculum does not offer a separate pharmacology course, the test plan which consists of 12-18% Pharmacological and Parenteral Therapies [2] is used as a guide for making revisions in courses activities and clinical assignments.

Subject Selection Process

The participants for this research were selected from City Colleges of Chicago School of Nursing (CCCSON) at Malcolm X College. All nursing students were enrolled in the spring 2019 cohort and faculty was asked for their voluntary participation. This provided a sufficient participant pool for evaluation.

Consent

A consent was obtained from students and faculty. An announcement was placed on the Class of 2019 in Learning Management System (Brightspace) asking for voluntary participation of the students in the research. For the students that agreed, a consent was distributed prior to the examination. In a department meeting, faculty were asked for their voluntary participation to review student's ATI pharmacology assessments. Faculty participants who agreed gave consent and attended a one-hour meeting to review student's pharmacology scores on both examinations: ATI Pharmacology and ATI RN Comprehensive.

Research Design

Quantitative design of the study included a one-hour meeting for faculty. This meeting included a PowerPoint presentation of the findings from the student's exam, an Assessment article, short video "Summative Assessment Overview and Examples." At the conclusion of the meeting, a survey was distributed and collected.

Risks and Benefits

The benefit is that the information obtained in the one-hour meeting will facilitate the discussion of the relevancy of administering two summative examinations at the end of the nursing program. Another benefit is the pharmacology content on ATI RN Comprehensive may reflect the student's actual knowledge because the examination does count toward progression. The risks are the ATI RN Pharmacology examination is for assessment purpose only and does not count toward progression. Therefore, student's performance on this exam may not prove the student's actual knowledge of pharmacology content learned.

Data Collection Tool

The seven-question Likert survey was administered to faculty for evaluation and feedback of the effectiveness of the summative assessment's presentation. The five-point Likert scale rates "1" is strongly disagree, 3 is neutral (no opinion) and 5 is strongly agree. The reliability and the validity of this instrument have not been found. The Pharmacology and Comprehensive exam scores were retrieved from (ATI). The results of the post aggregated scores and program survey were tabulated using frequencies, means, and percentages. The data were compiled using Microsoft Excel and the results were depicted in a graph bar format for the data analysis.

Methodology/Procedures

Faculty participants who agree will be asked to attend a one-hour meeting. The investigators will present a PowerPoint presentation, read, and discuss an excerpt on assessments in “Evaluation and Testing in Nursing Education”, a short video on “Summative Assessment Overview and Examples”. At the end of the meeting, a seven-question program evaluation survey will be distributed. Faculty will review the aggregated scores of the spring 2019, 70-item Pharmacology and 180-item Comprehensive exams. The group scores of the two summative assessments (Pharmacology and Comprehensive) and survey were presented and discussed in a scheduled department meeting. Any faculty recommendations will be considered for revising or making changes with the summative assessments in the nursing curriculum for fall 2020.

Findings

The overall survey response of the eight-faculty showed six of the seven evaluated questions ranged from 90-92%. Three faculty commented that the presentation would be resourceful and beneficial in making curriculum decision about course summative assessments for the next academic year. One question related to time allotted for the presentation received 80%. A few comments expressed that more time is needed to discuss the use of two summative assessments.

The results identified that the ATI RN pharmacology exam scores had no significant effect on the student’s performance on the pharmacology content on the ATI RN Comprehensive Predictor examination. The analyzed data revealed that in the Spring 2019, 30 out of the 37 students did better on the pharmacology portion of ATI RN Comprehensive Predictor exam than the ATI RN-Pharmacology exam. The scores ranged from +0.6 to 33.3 percent. The seven students that scored better on Pharmacology better ranged from 0.2 to 10.2. This information demonstrates that 81% of the students passed the content. In the Fall 2019 cohort, 41 scores were reviewed, all students scored higher on the pharmacology portion of the Comprehensive Predictor exam than the Pharmacology exam. The scores ranged from +1.0 to 52.3 percent. This information reveals that 100% did better on the Pharmacology portion of the ATI-RN Comprehensive exam.

Discussion

Faculty addressed the following two questions: Does the ATI RN Pharmacology examination provide an accurate assessment of the learned content? Do the ATI RN Pharmacology results correlate with the students’ performance on the ATI RN Comprehensive Predictor examination? The weight of the exams makes a difference in student’s performance.

Some faculty do not think students took the pharmacology exam serious

Students were not required to meet a benchmark on the pharmacology exam but were required to meet a benchmark on the ATI RN-Comprehensive Predictor exam to exit the program.

What is the relevance of administering two exams if the students to assess pharmacology knowledge?

Limitations

One of the limitations of this study was the decreased in the generalizability of the findings due to a small sample size. Another limitation is the study was conducted at a single associate degree nursing program and lack studies done using two standardized summative assessments to measure one specific topic. The inclusion of using two summative assessments to measure the same topic could have an impact on the results.

Conclusion and Significance

To provide accurate results, various forms of assessments should be utilized to measure one’s knowledge. One of the best approaches to assess the level of student’s knowledge is to first decide the value of an exam. Student’s performance on an assessment with value may have better results than an exam with no value. The ATI RN Pharmacology examination results may not reflect student’s knowledge of the content because there is no value and does not count toward program completion. Recommendations are for the 70-item ATI RN pharmacology exam have a graded item value or omit it as an additional assessment. Future studies should review how non progression/weighted exam may impact accurate results on summative assessments in nursing associate degree programs.

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