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ASSESSING THE KNOWLEDGE GAP IN BIOMEDICAL SCIENCES AMONG NURSING STUDENTS: AN EDUCATIONAL STUDY

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Abstract
The disconnect between nursing education and the biomedical sciences can hinder the quality of patient care. This study aims to assess the knowledge gap in biomedical sciences among nursing students and its implications for nursing practice. Data were collected from a sample of 200 undergraduate nursing students through questionnaires and focus group discussions. The results indicate significant gaps in knowledge regarding key biomedical concepts and their applications to patient care. Recommendations for curriculum enhancements and teaching methodologies are suggested to bridge these gaps, thereby improving nursing competencies and patient outcomes.

Keywords: Bioinformatics, Biomarkers, Biotechnology

Introduction

The nursing profession continuously evolves as healthcare demands increase and patient complexities escalate. Adequate knowledge of biomedical sciences is crucial for nursing students, as it underpins the understanding of human anatomy, physiology, pathophysiology, and pharmacology (Ben Natan et al., 2020). Despite the recognized significance of biomedical sciences in nursing curricula, many students exhibit knowledge gaps that may compromise their clinical performance and decision-making abilities (Fitzgerald et al., 2018). This research article aims to investigate the current state of biomedical sciences knowledge among nursing students and explore potential educational interventions to enhance this area of their training.

Literature Review

Importance of Biomedical Sciences in Nursing

Biomedical sciences lay the groundwork for nurses to assess, plan, implement, and evaluate patient care effectively (McNair et al., 2017). A solid understanding of these sciences enables nurses to interpret clinical signs, apply appropriate interventions, and communicate effectively with interdisciplinary teams (Britt & Burch, 2016).

Challenges in Nursing Education

Recent studies reveal significant disparities in nursing students' comprehension of biomedical terms and principles (Fitzgerald et al., 2018). Barriers to effective learning include overly theoretical approaches, limited exposure to practical applications, and the variability in teaching methodologies across institutions (Ben Natan et al., 2020). Additionally, the curriculum often emphasizes practical skills at the expense of theoretical understanding, further contributing to knowledge gaps (McNair et al., 2017).

Implications of Knowledge Gaps

Knowledge deficits in biomedical sciences can lead to inadequate patient assessments, ineffective interventions, and negative health outcomes (Britt & Burch, 2016). These deficiencies can also affect nurses' confidence, contribute to increased medical errors, and ultimately compromise patient safety (Fitzgerald et al., 2018).

Methodology

Study Design

This study utilized a mixed-methods approach, combining quantitative and qualitative data collection methods to comprehensively assess the knowledge of biomedical sciences among nursing students.

Participants

A total of 200 undergraduate nursing students from various academic years at a mid-sized university were recruited through convenience sampling. Ethics approval was obtained, and informed consent was secured from all participants.

Data Collection

Quantitative Data

A structured questionnaire composed of multiple-choice and Likert-scale questions was administered to evaluate students' knowledge of biomedical concepts and principles. The questionnaire included sections on human anatomy, physiology, pathophysiology, and pharmacology.

Qualitative Data

Focus groups were conducted with 40 nursing students, where participants discussed their experiences with biomedical sciences courses, perceived barriers to learning, and suggestions for improvement. Each session lasted approximately 60 minutes and was audio-recorded, transcribed, and coded for analysis.

Data Analysis

Quantitative data were analyzed using descriptive statistics, while qualitative data were processed using thematic analysis to identify recurring themes and insights.

Results

Quantitative Findings

The questionnaire results revealed that nursing students scored an average of 65% on knowledge assessments related to biomedical sciences. The highest scores were recorded in anatomy (72%), while pharmacology yielded the lowest average scores (58%).

Qualitative Insights

Analysis of the focus group discussions revealed several themes:

Perceived Difficulty: Students expressed difficulty in grasping complex biomedical concepts, especially pharmacology and pathophysiology.

Teaching Methodology: Many students highlighted the need for more interactive teaching methods, such as practical labs and case studies, to enhance understanding.

Resource Availability: A lack of accessible resources, such as textbooks and online materials, was identified as a barrier to effective learning.

Discussion

The findings from this study illustrate a concerning knowledge gap in biomedical sciences among nursing students, echoing previous research in this area (Fitzgerald et al., 2018). It is evident that while nursing students possess foundational knowledge, there remains a critical need for improvement, particularly in pharmacology.

Recommendations for Educational Interventions

Curriculum Review: Nursing programs should undertake a thorough review of their biomedical sciences curriculum to identify gaps and integrate more comprehensive content.

Active Learning Strategies: Employing innovative teaching methodologies such as problem-based learning and simulation can foster deeper understanding and retention of biomedical concepts.

Increased Resources: Developing supplementary online platforms and libraries can provide students with additional resources to enhance their learning experience.

Conclusion

Addressing the knowledge gaps in biomedical sciences among nursing students is vital for preparing competent, confident nurses who can provide high-quality patient care. By implementing strategic educational interventions, nursing programs can significantly improve student understanding and application of biomedical sciences, ultimately leading to better patient outcomes.

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