Measurement of Change in Nursing Students’ Attitudes Towards Biochemistry in a Clinically Relevant Course

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Background

- Biochemistry has traditionally been viewed as a difficult course by nursing students
- Perception of relevance to nursing practice has been shown to affect attitudes
- These attitudes have been correlated with performance in science classes

Background continued

- It is important to ensure that nursing students have a solid foundation in science
- This is because improved patient care has been linked with knowledge of science
- But unfortunately nursing students often fail to see the relevance to practice

Study Objective

Because of the link to better patient care and that of attitude with performance, attitudinal changes due to highlighting the applicability of biochemistry to clinical practice were investigated

Research Question

Will nursing students’ attitude towards biochemistry change when the content of a course is made relevant to clinical practice?

Level 1 Biochemistry for Nursing

- The nursing biochemistry course was previously delivered as an online, self-directed course, accompanied by weekly tutorials
- This year the course was taught face-to-face for the first time
- Several practices were implemented to make the course more relevant for health practitioners
Changes in Course to Introduce Relevance

- A medical biochemistry book was adopted
- Clinical cases were added to the end of each lecture related to the content
- Tutorials used cases from the PBL/PBL nursing courses

Methods

- Ethics approval was first sought for all 3 sites of the Collaborative Nursing BScN Program (McMaster University, Mohawk College, Conestoga College)
- A paragraph stating why biochemistry was important in nursing was solicited from Nursing Faculty and students (from levels 2, 3, and 4)
- The paragraphs were assembled with student answers grouped together and faculty paragraphs together

Methods continued

- Due to the newness to qualitative data analysis, we researched methods and proceeded as instructed in “A Method of Analyzing Interview Transcripts in Qualitative Research” by Philip Burnard (Nurse Education Today (1991) 11, 461-66)
- Researchers analyzed the data separately, highlighting various themes in different colours
- We then met to discuss the themes that had emerged and attain consensus

Sample of Qualitative Analysis

Survey Development

- To develop the statements for the survey we reviewed the literature for any existing instruments
- We modified statements from published reports and also thought it was important to add a few statements on self-efficacy because of its link to attitude and performance

Instrument Validation

- Experts on qualitative data analysis within the School of Nursing were consulted for feedback and a small pilot test was done to ensure readability
- Phase I survey development was presented in December 2010 as a poster at:
Survey Contents

- The survey questions were further adapted based on expert guidance
- The final instrument consisted of 13, 7-point Likert style questions, where 1 is strongly disagree and 7 is strongly agree
- In addition we asked demographic questions

Survey Delivery

- Our finished instrument was administered through Lime Survey; emails were sent to approximately 440 students requesting participation
- A chance to win 1 of 3 bookstore gift certificates was offered in exchange for completing 2 surveys

Timeline

- Surveys were opened for completion at the beginning and again at the end of the 2nd semester course
- 124 surveys were completed in the first 2 weeks of January
- 65 surveys were completed in April after the conclusion of the course

Data Analysis

- Data was analyzed in Microsoft Excel and pie-charts were used to illustrate shift in opinion
- Answers were categorized as negative (1, 2, or 3), neutral (4) and positive (5, 6, or 7)
- Statistics were done in Excel as well, comparing initial answers with final by 2-tailed T-test using p < 0.05 to establish significance (data was unpaired)

Results

- All answers moved in the correct direction (more negative or more positive depending on the nature of the question)
- Answers to 3 of the questions changed significantly after completion of the course
  - Q9 - Biochemistry knowledge helps me to understand rationale for patient treatment
  - Q10 - Knowledge of biochemistry helps me to explain the importance of exercise to patients
  - Q12 - I do not expect to use biochemistry much for patient education
- Change in attitude to greater agreement was evident looking at the graph of Question 1 – “Biochemistry helps me understand the chemical processes of the human body”, but the data did not reach statistical significance
Results were similar for Question 4, but less dramatic – “Much of what I learn in biochemistry will be useful in my nursing practice”

Question 13, about self-efficacy asked – “I am confident that I can do well on biochemistry tests” and showed a positive shift, but again this was not a significant change.

Discussion

As mentioned, change in attitude always shifted in the correct direction, but did not always reach statistical significance.

Although the questions were constructed using qualitative data from students about the importance of biochemistry in nursing, the changes in attitude can be mapped to course learning outcomes.

Learning Outcomes

Q9 - Biochemistry knowledge helps me to understand rationale for patient treatment

Learning outcomes that map to this question are:

• Recognize normal values for metabolites in healthy individuals from laboratory results
• Apply knowledge of basic principles to assess what processes may be deranged when laboratory values differ from normal

Q10 – Knowledge of biochemistry helps me to explain the importance of exercise to patients

Learning outcomes that map to this question are:

• Understand the link between
  • Biochemical processes and where they occur in the body
  • Nutrient classes and metabolic processes
• Describe the different macromolecules and in what bodily processes they are involved

Q12 – I do not expect to use biochemistry much for patient education

Learning outcomes that map to this question are:

• Describe the different macromolecules and in what biochemical processes they are involved
• Apply knowledge of basic principles to assess what processes may be deranged when laboratory values differ from normal

Q13 – I am confident that I can do well on biochemistry tests
Study Limitations

- One of the limitations of study was the low number of respondents, especially on the second survey.
- Answer sets from the two surveys were not be paired due to the way the Lime Survey was set up.
- The first survey was completed in the first two weeks of the course, would have been better to have the survey completed before the beginning of the course.

Conclusion

- The study showed that attitudes of nursing students towards a course such as biochemistry can be changed by demonstrating the relevance to their future profession.
- This work provides a contribution to future curriculum development.

References