Anatomical Knowledge Retention in Second-Year Bachelor of Science & Psychiatric Nursing Students

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Introduction

There is growing concern that nursing, medical and allied health students do not retain enough anatomical knowledge to confidently and successfully apply it in future classroom and clinical settings (Doomernik et al., 2017). Evidence now shows that knowledge retention is impacted by many factors including admission criteria, teaching hours (Narnaware and Neumeier, 2019), age, sex, ethnicity, prior knowledge of science/biology, a gap between high school and university, and health care discipline (McVicar et al., 2015; Vogl, 2017). In Canada, the discipline of nursing can be subdivided into three professional designations, each with different educational requirements; Registered Nurses, Licensed Practical Nurses, and Registered Psychiatric Nurses (Canadian Nurses Association, 2019).

Objectives

At MacEwan University students in the Psychiatric Nursing Diploma Program (PND) and the Bachelor of Science in Nursing Program (BScN) take the same first year anatomy course. With the understanding that discipline choice has a potential impact on knowledge retention, this study aimed to determine the overall difference in anatomical knowledge retention between second-year PND students and second-year BScN students, and if there is a difference based on organ system.

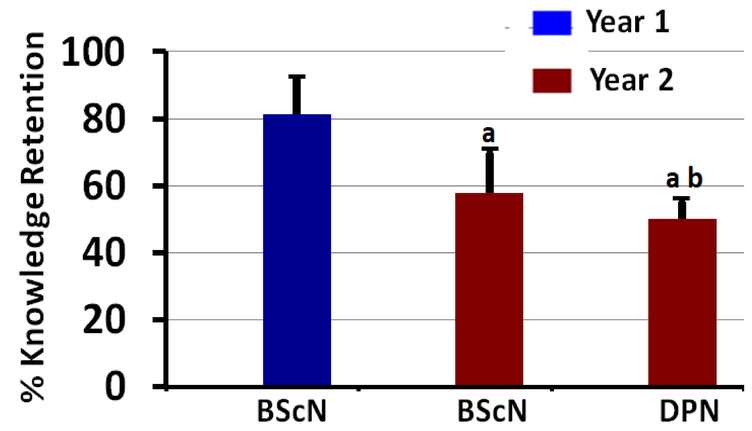
Methods

To address these questions, second-year PND and BScN students were quizzed on knowledge that was covered in the anatomy course. For each system, students were asked to answer nine to eleven knowledge and comprehension level multiple-choice questions. The scores from these quizzes were compared to the first-year examination scores on the same content to determine overall knowledge retention.

Data were statistically analyzed using SPSS II, and means were compared using 2-sample t-tests and two-way ANOVA. The scores are described for each organ system by reporting the mean and standard deviation (SD).

Results

The mean score of questions from all organ systems in year one was 81.16 ± 10.6 (SD). Comparing that score to matched test items in year two, there is a significant decrease in the overall mean score from 81.16 ± 10.6 (SD) to 57.86 ± 11.8 (SD) ($P<0.01$) in BScN students and 51.05 ± 6.06 (SD) ($P<0.001$) in PND students (**Figure 1**). This equates to a 76.7% retention rate in BScN students and 69.8% retention rate in PND students. Compared to year 1, organ-specific knowledge retention levels varied between BScN students and PND students, however the highest retention and lowest retention systems were similar between both cohorts. The highest retention levels were seen in the gastrointestinal system (89.7% BScN; 80.5% PND), respiratory system (88.5% BScN; 86.3% PND), integumentary system (80.1% BScN; 72.7% PND) and special senses (78.7% BScN; 63.0% PND). Retention levels were lowest for the musculoskeletal system (69.3% BScN; 62.2% PND) and the vascular system (53.9% BScN; 62.8% PND) **(Table 1)**. This demonstrates a significant decrease in knowledge retention in both PND and BScN students over the course of one year.



Anatomical knowledge retention in Bachelor of Science (BScN) and Psychiatric Nursing Diploma (PND) second-year students. The data represents the overall percent (%) knowledge retention in BScN and PND students compared to an overall % retention on the same organ systems in the year 1.
a $P<0.01$ compared to year 1.
b <0.05 compared to BScN

Table 1.

Difference in Knowledge Retention in Second-Year Bachelor of Science in Nursing (BScN) & Psychiatric Nursing Students (BPN)

Organ system	Year 1	Year 2			
		BScN		DPN	
	(Mean ± SD	(Mean ± SD)	% knowledge *lost*	(Mean ± SD)	% knowledge *lost*
Integumentary	90.6 ± 6.8	70.7 ± 25.4	19.9%	63.3 ± 26.9	27.3%
Special Senses	88.4 ± 6.9	67.08 ± 22.9	21.3%	51.4 ± 23.7	37.0%
Gastrointestinal	63.6 ± 6.9	53.34 ± 14.9	10.3%	44.1 ± 15.8	19.5%
Respiration	72.9 ± 5.8	61.43 ± 22.1	11.5%	53.2 ± 21.8	19.7%
Vascular system	83.5 ± 5.4	37.39 ± 21.4	46.1%	46.1 ± 27.0	37.2%
Musculo-skeletal	88.0 ± 7.0	57.27 ± 32.9	30.7%	50.2 ± 22.9	37.8%

BScN: Bachelor of Science in Nursing
PND: Psychiatric Nursing Diploma

Discussion and Conclusion

Retention levels were organ system and cohort-specific. PND students demonstrated a significantly lower overall retention rate, however, had a higher level retention in the low scoring vascular system, and less variance in retention levels between systems compared to BScN students. The results from present study demonstrated that length of degree/diploma programs, admission criteria and prior background in science in high school (McVicar et al., 2014; 2015) are some of the factors that could impact anatomical knowledge in DPN and BSCN students, and a stronger interventional strategies needs to develop improve the anatomical knowledge retention in PND students.

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