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Original Research Article

Influence of Faculty Organised Revision Sessions on Anatomy Assessment Results

Goran Štrkalj *[1], Joyce El-Haddad [2], Anneliese Hulme [3], Mitchell Morfea [4], Stephanie Marhoff-Beard [5], Mirjana Štrkalj [6].

*[1] Professor and Discipline Lead, Anatomy, Histology, and Pathology, College of Medicine and Public Health, Flinders University, Adelaide, Australia.

[2,3] Lecturer, Department of Anatomy, University of New South Wales, Australia.

[4] Tutor, Department of Chiropractic, Macquarie University, Australia.

[5] Associate Lecturer, Department of Chiropractic, Macquarie University, Australia.

[6] Senior Lecturer, Department of Biomedical Sciences, Macquarie University, Australia.

ABSTRACT

Background: Introductory anatomy courses present challenges for educators at many institutions as they frequently comprise large numbers of students with dissimilar levels of preparedness, belonging to different academic programs.

Setting: At Macquarie University, Introduction to Anatomy course enrolls students belonging to four different faculties and programs ranging from health professions to law and archaeology. The failure rate has traditionally been quite high, with two practical tests (mid and end of the semester) being particularly challenging. Several strategies have been employed to improve students' performance.

Intervention: In 2018, a week before each practical test, revision sessions were introduced, where attendance was optional. These four-hour sessions were amalgams of traditional teaching and peer-assisted learning. This study aimed to assess the value of revision sessions by comparing the test results of students who attended and those who did not.

Outcome measure: Marks attained in the practical test.

Results: A total of 598 students were enrolled in the course in 2018, of which 162 (27.1%) attended revision session 1 and 177 (29.6%) session 2. The average mark for practical test 1 for students who attended revision sessions was 78.8% and 74.6% in test 2, while those who did not attend achieved 61.8% and 54.5% respectively. Differences in marks for both tests were statistically significant ($p < 0.05$).

Conclusion: As there were no other changes in course delivery it can be hypothesized that revision sessions contributed to better practical test performance in 2018. These findings appear to corroborate previous research suggesting that systematic and focused revision sessions improve results in anatomy assessments.

KEY WORDS: **A**natomy Education, Revision, Assessment, Knowledge Retention.

Corresponding Author: Prof. Dr. Goran Štrkalj, Professor and Discipline Lead, Anatomy, Histology, and Pathology, College of Medicine and Public Health, Flinders University, Bedford Park 5042, Adelaide, Australia. **E-Mail:** goran.strkalj@flinders.edu.au

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INTRODUCTION

Introductory anatomy courses are offered at many tertiary education institutions. For many students, these courses are prescribed and necessary to fulfill program requirements or are entry prerequisites for postgraduate

programs. Introductory anatomy courses are usually delivered in the first year of study presenting challenges for educators as the courses frequently comprise large numbers of students, often belonging to various academic programs, and with dissimilar levels of preparedness. Furthermore, although labeled introductory, these courses present a level of difficulty that many students, particularly at the first-year level, find hard to cope with. Consequently, introductory anatomy courses are often characterized by high failure rates [1]. To counteract this problem various strategies have been implemented to provide additional support for students including advice on approaches to learning, providing supplemental instruction, and peer-assisted learning (PAL) sessions [1,2].

Macquarie University in Sydney, Australia has been offering an Introduction to Anatomy course to large and diverse groups of students since 2010. Various activities have been organized to support students. The aim of this study was to investigate the effectiveness of one such activity – faculty-organized revision sessions.

METHODS

This study was observational, case-controlled in design, and focused on a cohort of students enrolled in the Introduction to Anatomy course at Macquarie University in 2018. This course enrolls between 500 and 600 students, from four different faculties and several programs, including those in health professions, STEM (science, technology, engineering, and mathematics), and, albeit in small numbers, social sciences, law, and humanities. The failure rate in this course has historically been quite high, with two practical tests (anatomy spot tests), one mid- and the other at the end of the semester, which is particularly challenging.

The assessments in this course comprise weekly quizzes (contributing 20% to the final mark), two practical tests (20% each), and the theory exam (40%). Historically, the two practical tests were particularly challenging for the students. Several strategies have been employed to improve students' performance in this type of assessment. In 2018, a week before each practical test, revision sessions were introduced, with optional attendance. These four-hour sessions were amalgams of traditional teaching carried out by tutors and peer-assisted learning sessions conducted by PAL leaders.

In this study, test results of students who attended revision sessions and those who did not were compared. The Chi-square test of independence was used to ascertain the associations.

RESULTS

A total of 598 students were enrolled in Introduction to Anatomy in 2018, of which 162 (27.1%) attended revision session one, and 177 (29.6%) session two. The average mark for practical test one for students who attended revision sessions was 78.8%, and 61.8% for those who did not attend ($p < 0.05$) (Figure 1). In practical test two, the average mark for students who attended the second revision session was 74.6%, and 54.5% for those who did not attend ($p < 0.05$) (Figure 2). As there were no other changes in course delivery it can be hypothesized that revision sessions contributed to better practical test performance in 2018.

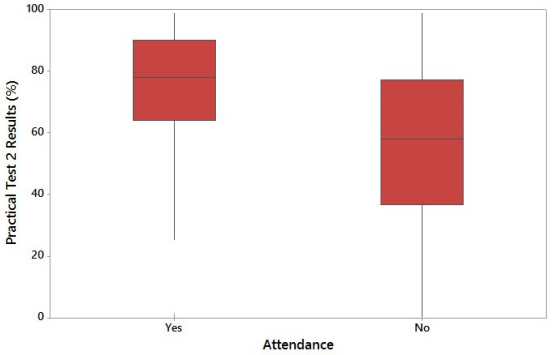

Fig. 1: Difference in practical test 1 results.

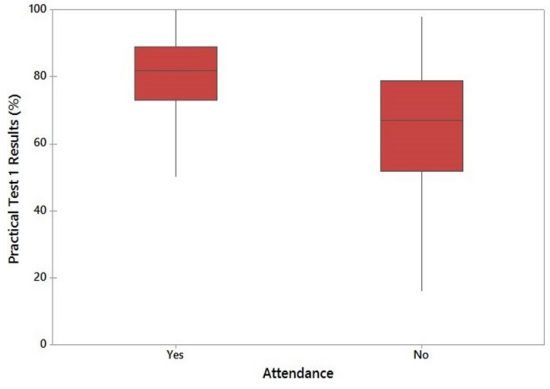

Fig. 2: Difference in practical test 2 results.

DISCUSSION

The Introduction to Anatomy course at Macquarie University presents basic concepts in gross anatomy, histology, and embryology. However, it is clear from the students' formal and informal feedback that they see this course as one of the most difficult in their first year of study. This is not surprising as anatomical sciences are characterized by considerable difficulty even at an introductory level. Thus, similar to other such courses, in Macquarie's Introduction to Anatomy "the volume of information and complexity of the material being covered challenges entering college students in ways they may not be prepared to handle" [1]. Students, especially those with little background in biology, need extra support in their studies and preparation for assessments.

It has been argued that cramming and prolonged revision before the assessments do not work in basic sciences. However, intensive, relatively short, and structured revision sessions seem to produce good results [3]. The current study corroborates this finding as students who attended short, but intensive and structured revision sessions achieved significantly higher marks in their practical tests. It could be argued that as participation in revision sessions was optional, those who attended were more likely motivated, high-achieving students who would perform better irrespective of their attendance to revision sessions. However, students that attended only one session, had test results significantly higher in the corresponding test only ($p<0.05$).

The revision sessions in the Introduction to Anatomy course provided a unique combination of formal tuition (delivered by academic staff) and PAL sessions (delivered by students who achieved high marks in the same course in the previous academic year) and assisted students in several ways. The sessions enabled students to revise and identify gaps in their knowledge, clarify difficult concepts, and revisit subjects of concern. At the same time, students were able to better focus their revision on the course's learning outcomes and could seek advice on the best approaches to the challenges of summative assessments in a relatively relaxed environment where they interacted with their peers [4, 5].

It should be noted, however, that the faculty-organized revision sessions were only a part of the broader support program offered to this group of students. This program included various other activities including the organization of study groups, additional tutorials, regular formative assessments, and a wealth of online materials delivered through the Moodle based "iLearn" platform [6,7,8]. This multipronged approach has resulted in significantly better students' performance in the Introduction to Anatomy course, without compromising educational standards or any of the learning outcomes. Indeed, in the last six years, due to the implementation of these strategies, the failure rate has decreased from 30% to 8%.

CONCLUSION

The faculty organized revision sessions and helped students to prepare for their anatomy practical test. Together with other support strategies, they contributed to improved outcomes in the Introduction to Anatomy course at Macquarie University. Similar revision sessions could provide comparable results at other tertiary education institutions offering introductory anatomy courses.

Conflicts of Interests: **None**

Author Contributions

Goran Štrkalj: conception and design, analysis and interpretation of data, drafting and revising the manuscript.
Joyce El-Haddad: data collection, analysis and interpretation of data, revising the manuscript.
Anneliese Hulme: data collection, analysis and interpretation of data, revising the manuscript.
Mitchell Morfea: data collection, revising the manuscript.
Stephanie Marhoff-Beard: analysis and interpretation of data, revising the manuscript.
Mirjana Štrkalj: analysis and interpretation of data, revising the manuscript.

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