International Journal of Scientific Research and Management (IJSRM)
||Volume||12||Issue||02||Pages||986-989||2024||
Website: www.ijsrm.net ISSN (e): 2321-3418
DOI: 10.18535/ijsrm/v12i02.mp01

The Influence of the Use of the Mnemonic Method for Memorizing the Bones of the Carpal Tunnel by the Medical Student

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Abstract
Anatomy is considered the cornerstone of medical education; Anatomical knowledge is essential for doctors regardless of their specialty. Many articles have compared anatomy teaching methods. This study was designed to evaluate the usefulness of a simple mnemonic method for memorizing the carpal tunnel bones.Twenty-six physiotherapy students, 3rd year trainees in the rehabilitation and functional rehabilitation department, were included in this study,when A majority of students (63.7%) said they were satisfied with the mnemonic method .The influence of using mnemonic method for memorizing the anatomical region studied before or after the course positively influences the students' understanding of anatomy. Based on our experience and student feedback, we strongly advocate the use of the mnemonic method for memorization as a course adjacent in anatomy teaching

Introduction

Anatomy is considered the cornerstone of medical education; Anatomical knowledge is essential for doctors regardless of their specialty. Additionally, a thorough knowledge of anatomy is essential for surgeons and radiologists, due to the continued development of surgical techniques and imaging technologies. Thus, it is important for anatomy teachers to choose effective teaching methods [1].

Drawing a human form is used to scientifically and aesthetically explore, understand and reveal the human body.

In the literature, many articles refer to blackboard drawings as a powerful tool for teaching anatomy. Some of the anatomy-teaching books offer drawing techniques as well as coloring of pre-printed drawings. Mc Menamin finds a positive influence of body painting on the teaching and learning of anatomy.

Cadaver dissection remains the commonly used method to put theoretical information into practice and is adopted in most anatomy courses [2] .

Many articles have compared anatomy teaching methods: traditional dissection of human cadavers vs. plastic models, medical imaging or virtual computer programs. The importance of varying educational resources in the teaching of anatomy has been highlighted in the literature.

Thus emerges the need to explore whether the combination of drawing with the dissection session helps medical students to better understand and memorize anatomy.

This study was designed to evaluate the usefulness of a simple mnemonic method for memorizing the carpal tunnel bones [3].

Materials and methods

Twenty-six physiotherapy students, 3rd year trainees in the rehabilitation and functional rehabilitation department, were included in this study. The study took place during the first semester of the 2022-2023 academic year. The subject of the courses was osteology.

The students were randomly divided into two blinded groups.

Students in group 1 (n = 13) were taught about the carpal bones without a mnemonic method.

Students in group 2 (n = 13) learned about the carpal bones with the mnemonic method.

Region memorization was assessed twice, one week and seven weeks after the course. We used a print on which the carpal bones were drawn. Other additional information was requested such as last year's anatomy exam grades, students' opinions on the mnemonic method, and whether the student had revised the anatomical region assessed before the second assessment.

The data were coded and entered into an Excel® spreadsheet, then transferred to SPSS (version 19). The T test was used to compare means using a significance level of 0.05.

Results

Last year's anatomy grade average was 68.2%,

70.2% respectively for groups 1, 2 which was not statistically significant.

At the first assessment, the highest average score was in group 2 (12.49/20) vs group 1 (11.71/20).

The difference between students who learned using the mnemonic method and those who did not was statistically significant (group 1 vs. group 2, $P < 0.0001$).

The second assessment 6 weeks later demonstrated that students who learned using the mnemonic method had better memorization of the carpal bones and anatomical structures compared to students who did not rely on the mnemonic method. .

not zero (group 2 14.08/20 vs. group 1 12.76/20, $P = 0.001$)

The influence of revision was investigated to show whether there were any significant differences between groups. Students were asked how many times they revised before the second assessment (0 = no revision, 1 = revision once or 2 = revision twice), the percentages of students who revised in the two groups were respectively 61% and 67%.

The average number of revisions in groups 1, 2, and 3 was 0.85 and 0.94, respectively, with no difference between groups.

Considering only the students who revised, the score remains significantly higher in groups 2 vs group 1, (group 2, $14.5/20 \pm 3.94$ vs group 1, $13.02/20 \pm 4.59$, $P = 0.005$)

A majority of students (63.7%) said they were satisfied with the mnemonic method.

Discussion

In this study, we explored the use of the mnemonic method for memorizing an anatomical region by the students themselves on their understanding and memorization.

Physical therapy students join physical therapy school directly after high school. The students' curriculum is comprised of traditional teaching modules designed for large groups of students. General anatomy is studied

in the first and second year, it consists of didactic lectures and practical laboratory sessions. The teaching style is primarily teacher-centered, where knowledge is passed from the teacher to the students.

The number of students around each class is 15-20. Therefore, some students receive information passively. The information is generally provided in French. Since gross anatomy course is limited to didactic lectures and requires memorization, students may not appreciate the relevance between gross anatomy and other topics.

Therefore, during their clinical attachment years, it is difficult for them to apply their anatomical knowledge in solving clinical problems.

Students were asked to draw regional anatomy during anatomy class. The aim of our study was to demonstrate that such an approach in teaching regional anatomy was useful for receiving, recalling, understanding and reinforcing the learning of regional anatomy.

Recently, a medical school decided to replace the use of the cadaver with the use of living anatomy and imaging medicine. However, numerous articles confirm the importance of dissection sessions in all medical training despite emerging innovations in anatomy teaching such as the use of computer-aided construction and virtual reality [4] .

The positive impact of teaching anatomy through drawing has been reported. Encouraging students to draw or practice body painting exercises in the study of anatomy has been recommended. To our knowledge, the influence of using mnemonic method for memorization has not been estimated before.

As any experienced teacher knows, you really know a subject when you can teach it yourself. By making anatomy drawings, students are literally teaching themselves the subject.

Drawing the anatomical region as preparation and learning mnemonic method for memorization before the anatomical dissection course will motivate the student during the session and increase his attention since he will become familiar with the anatomical terms and the relationships between the structures and their positions in the layers. On the other hand, drawing after the dissection session can help the student to deepen the knowledge he acquired during the dissection course which will positively influence his learning [5] . In our study, the average score of the students supports this argument since the difference between the students who learned the

mnemonic method for memorization, before or after the dissection session, and those who did not did so was significant. During the second evaluation, 6 weeks later, and despite the fact that some students revised the region one or more times after the first evaluation, the difference between the two groups of students remained significant and demonstrates that the use of method mnemonic for memorization by the student positively improved the result [6] .

About two-thirds of students were satisfied with this learning approach. Some dissatisfied students perceived the mnemonic method for memorization as a burden that had no direct impact on their learning.

Conclusion

The influence of using mnemonic method for memorizing the anatomical region studied before or after the course positively influences the students' understanding of anatomy. Encouraging students to create their own mnemonic method for memorization will facilitate their recall and understanding of anatomical regions. Based on our experience and student feedback, we strongly advocate the use of the mnemonic method for memorization as a course adjacent in anatomy teaching.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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