

PERCEPTIONS REGARDING THE INTEGRATED HUMAN ANATOMY AND PHYSIOLOGY COURSE AMONG UNDERGRADUATE PHARMACY STUDENTS

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Abstract

Human Anatomy and Physiology is an important core component for all allied healthcare professional education. At our university, we offer an integrated Human Anatomy and Physiology course (HAP) to the first year Pharmacy students. The main objective of this study was to ascertain and compare Pharmacy undergraduate students' opinions and attitudes towards the integrated course of human anatomy and physiology.

A pre-validated questionnaire was given to students of first year pharmacy at the end of their course and the data was analyzed using appropriate statistical tools. The students perceived both the subjects equally and majority felt that both these subjects, although difficult, were important to their future. The students were of the opinion that overall the teaching methodologies and assessment tools used were fair, useful and valid.

This feedback about the student perceptions could be valuable to guide us to a better designing of the curriculum and in faculty development and training in pedagogical approaches.

Keywords:

Integrated Anatomy and Physiology course, Pharmacy

Introduction

Modern healthcare and science education is currently undergoing pioneering evidence-based changes not only in teaching and learning but in curriculum too. Significant changes are being made in the curriculum of basic sciences to provide a scientific basis for clinical practice and increase students' ability for critical analysis in their profession. Anatomy and Physiology forms one of the important basic sciences courses which are mandatory for most of health care professionals. This is seen as an important core component of any curriculum which lays the foundation of the basic knowledge of the structure and functions of human beings. Currently with the vast explosion of knowledge, new drugs being introduced, novel diagnostic and interventional techniques developed and a better understanding of how the genome alters functions, it is more and more critical for the present day Allied healthcare students to understand the basic principles of both normal and abnormal Anatomy and Physiology.^{1,2} A lot of discussion has been generated on how much to teach undergraduates in the current scenario and how to make it more relevant to the students at the same time making sure that the basic concepts and principles are adequately covered.^{1,2,5,6} Attitude and viewpoints of students towards a particular course influences their behavior and learning to a great extent³. Social psychological research and cognitive psychology have shown that behavior and learning is sometimes unconsciously influenced by the perceptions of an individual.⁴ This often determines how well the students learn and understand the subject. Obtaining the viewpoints of students also aids in curriculum planning, development and relevant changes for the next generation of students.

At Ras Al Khaimah Medical and Health Sciences University, UAE, we offer an integrated Human Anatomy and Physiology course (HAP) during the first year of the four year bachelor's program in Pharmacy. The HAP course at our university comprises of both theory and laboratory components delivered in two semesters. HAP1, offered in the first semester covers the introduction and basics concepts of anatomy and physiology of Musculoskeletal,

integumentary, gastrointestinal, cardio vascular and respiratory systems. HAP II, during the second semester covers the excretory, endocrine, reproductive and central nervous systems. The prescribed textbook is Ross and Wilsons Anatomy and Physiology in health and disease which is an Elsevier publication.²¹A combination of passive lectures and active teaching methodologies like Team based learning (TBL) are used to deliver the course.

This study was undertaken with the main objective to ascertain and compare Pharmacy undergraduate students' opinions and attitudes towards the integrated course of human anatomy and physiology.

This study also aims to enhance the awareness among students regarding the utility of anatomy and physiology, as it is in the first year that a foundation towards a positive attitude to the subject can be laid.

Materials and methods

A questionnaire comprising of series of statements regarding the Human Anatomy and Physiology course was generated from available relevant articles obtained from peer reviewed journals. The questions were close ended and the responses were graded on a 5 point Likert scale ranging from 5 = strongly agree to 1= strongly disagree. The number of questions was kept low to ensure maximum compliance. The questions were directed mainly towards the attitudes of the students toward the two subjects of the course and also gathered information about what the students perceived about the teaching methodologies and assessment tools used.

The questionnaire was validated for content by the faculty and pre-validation was done on students who were not part of the study. The Cronbach's Alpha was used to check the internal consistency of the questionnaire which gave a value of 0.8.

Ethical clearance from the Institutional Ethics Committee was obtained and then the questionnaire was administered to the students undergoing the first year of the Bachelors in Pharmacy program towards the end of their academic year.

A clear explanation was given to the students regarding the study and written informed consent was taken prior to administering the questionnaire. Students were also encouraged to give any other comments regarding the course.

Participation was voluntary and no incentives were given to the students.

The self-administered questionnaire was anonymous but participant characteristics including age, gender and nationality were collected.

Statistical analysis – Appropriate statistical tools (SPSS 18) was used to analyze the data. The responses were categorized into 3 groups (agree, neutral and disagree) for analysis.

A comparison was done between the responses of the students using the Chi square test with p value < 0.05 taken as significant.

Results and discussion

Results

A total of 51 students between the ages (17-22) completed the questionnaire out of a total 65 students representing a response rate of 78.4%. 20(39.2%) were males and 31(60.7%) were females. 10 students were part of the pre-validation process. The questionnaire was administered towards the end of the course.

The students perceived both the subjects equally and majority felt that both these subjects were important to their future and that all pharmacists required good knowledge of both anatomy and physiology.

Further analysis of data revealed that there was a mixed reaction to the statement on the difficulty of the subjects. One third of the students agreed that the subjects were difficult; one-third disagreed and one third of the class were neutral. A very similar pattern of distribution was seen in response to the question on the period of one year allocated for teaching.

Assignments in Physiology and OSPE in anatomy were found to be useful tools of assessment. The students were of the opinion that overall the teaching methodologies and assessment tools used were fair, useful and valid

Table 1: Responses of students to individual items of the questionnaire pertaining to their perceptions towards the Human Anatomy and Physiology Course. The responses are categorized into 3 groups (agree, neutral and disagree) for analysis.

Items	Anatomy			Physiology		
	Disagree	Neutral	Agree	Disagree	Neutral	Agree
This subject is important for your course	6	7	38	6	8	37
Every pharmacist requires good knowledge of this subject	5	9	37	4	15	32
It is difficult to understand and retain this subject	19	13	19	17	15	19
The concepts taught in this course were clear	7	12	32	7	18	26
The time of one year allotted to teaching this subject is not enough.	17	13	21	19	11	21
Please rate the usefulness/validity / fairness /of the following teaching methodologies and assessment tools. 1= NOT useful/valid/fair 5 = VERY useful/valid /fair						
Lectures	5	9	37	7	10	34
Practical laboratory sessions	5	12	34	7	12	32
TBL – Team Based Learning	6	17	28	9	15	27
Assignments	14	10	27	10	10	31
MCQs	5	12	34	7	8	36
OSPE (Practical exams)	12	14	25	13	14	24
QUIZ	6	12	33	7	12	32

Table 2: Statistical analysis of items in the questionnaire

Items	Anatomy		Physiology	
	Mean \pm SD	P value	Mean \pm SD	P value
This subject is important for your course	4.07 \pm 0.93	0.001	4.05 \pm 0.95	0.001
Every pharmacist requires good knowledge of this subject	4.01 \pm 0.98	0.001	3.94 \pm 1.06	0.001
It is difficult to understand and retain this subject	2.98 \pm 1.24	0.33	3.05 \pm 1.17	0.1
The concepts taught in this course were clear	3.70 \pm 1.02	0.001	3.5 \pm 1.02	0.01
The time of one year allotted to teaching this subject is not enough.	3.25 \pm 1.35	0.18	3.15 \pm 1.44	0.55
Lectures	4.03 \pm 0.97	0.001	3.76 \pm 1.14	0.001
Practical laboratory sessions	3.90 \pm 1.15	0.001	3.84 \pm 1.17	0.001

TBL – Team Based Learning	3.64±1.18	0.001	3.47±1.25	0.02
Assignments	3.43±1.37	0.3	3.60±1.28	0.02
MCQs	3.80±1.03	0.001	3.82±1.14	0.001
OSPE (Practical exams)	3.37±1.09	0.01	3.31±1.24	0.2
QUIZ	3.74±1.11	0.001	3.74±1.16	0.01

Correlation is significant at the 0.01 level

Discussion

A paradigm shift is currently underway in all aspects of healthcare education. More emphasis is being placed on student centered, problem based, relevant teaching and learning.⁵This is especially true in the teaching of basic sciences where the current trend is to convert the passive learning environment into one that encourages a more active participation from the students and promotes independent lifelong learning.

A lot of studies describing the various theories of education underline the effect of perceptions and opinions on the inclination of the student towards the learning of any subject.⁷⁻⁹How teachers can improve the perceptions then becomes critical to the learning and understanding process of the students.

Many studies have been carried out that reflect the attitudes of various health care students towards the subject of anatomy and physiology separately¹⁰⁻¹⁴ but there are very few significant ones that deal with the two subjects that are offered as a combined integrated course.

Sturges and Maurer (2013) studied the perceptions of the allied healthcare students regarding the anatomy and physiology course. In their study although the students found human anatomy and physiology as a subject difficult because of various reasons, the course as a whole was overall perceived positively by the students.¹⁵ This is very similar to the response in this study where students exhibited a positive attitude towards the course although 37% of students were of the opinion that the subject was difficult to understand.

Michael J (2007) in his study explored the perceptions of the faculty with regard to the factors which contribute to the difficulty in learning physiology and identified three factors that included discipline, teaching and student related.¹⁶ Similarly more focused research is needed to understand the sources of difficulty from the students point of view.

Modern allied healthcare education has a lot of content which has to be delivered to the students. Each university has its own way of implementing the course delivery to students. Some colleges teach anatomy and physiology as separate courses while some offer it as a combined course which is less resource intensive and time saving. In such a scenario the faculty contribution and responsibility in effective design and delivery increases immensely.

It is important to note that student faculty discrepancies do exist in multiple areas. At our university keeping in mind the international standards, curriculum experts and faculty had designed the anatomy and physiology course for the Bachelor degree in pharmacy for one year. But our study showed that one third of the students feel that the time duration of one year for the course was not enough. Also surprisingly in our study the number of students who found the lectures to be useful was more than the number who found Team Based learning (TBL) to be useful. This is in contrast to a majority of studies worldwide which state that students enjoy and are more benefitted by active learning sessions rather than passive lectures.¹⁷⁻¹⁹This can probably be attributed to the fact that a diverse population of students having varying backgrounds participate in this course. Students entering this course straight from school are most comfortable with knowledge delivery in the form of lectures which is familiar to them.

Conclusion

The utility and necessity of both Anatomy and Physiology was perceived positively by the students in our study, even though a majority of them found the subject difficult. We believe that rather than worrying about covering course content teachers must realize that inspiring, motivating and creating positive attitudes in students is critical. Only then will the students develop an interest and love, for lifelong learning.^{6, 20}

The students are the end users of any teaching learning activity and are perfectly placed to give us the relevant feedback. This feedback about the student perceptions could be valuable to guide us to a better designing of the

curriculum, faculty development and training in pedagogical approaches and a better teaching of anatomy and physiology, which would then create a positive attitude among the students towards the course.

Limitations of our study

This study was applied to a single class of students. A larger cohort would yield more significant results. We would also like to apply the same study to other allied healthcare courses to compare and analyze the results. The performance of students was not analyzed and this would be an area for consideration for future studies.

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