

## **A Survey on the Student Preconceptions about Physiology among the Students of Saveetha Dental College**

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## **ABSTRACT**

**Introduction:** Medical Physiology is known to be a complex area where students develop significant errors in conceptual understanding. Anxiety, motivation and engagement with topics regarded as difficult to learn could potentially impact student success in these courses. Hence understanding both the prior knowledge students have coming into physiology

programs and the change in thinking students have when graduating from physiology is essential to design an effective instructional approach. It is clear that misconceptions arise from every individual's personal experience in the world of internally generated and hence perceptible forces and the perceived notion that results.

**Materials and Methods:** A self-administered questionnaire comprising about 10 questions was prepared and circulated through online among 100 individuals and the results were obtained.

**Results:** From the survey done it is found that most of the students have preconceived idea about physiology (97.9%). It is also found that nearly half of the sample population have the thought that learning physiology would be as difficult as any other subject of dentistry (41.4%). However the students quite remarkably are convinced of the fact that learning physiology would help them in dentistry (85.9%) and further they feel that if guidance given they would feel the subject lighter (78%). Very interestingly they accept the fact that their idea about physiology would probably change after a period of time (78.4%), probably in a positive and more appreciable way.

**Conclusion:** Prejudice and preconceived notions are actually a major problem of our brain. They create a "block" for free thought, and we become poor listeners and thinkers in the process. We should be aware of not to get caught in it as it may influence our learning process and may pose undue stress in learning the subject.

**Keywords:** Preconception, physiology, misconception, notion, flipped module.

## INTRODUCTION

Medical Physiology is known to be a complex area where students develop significant errors in conceptual understanding (1). Anxiety, motivation and engagement with topics regarded as difficult to learn could potentially impact student success in these courses (2). Hence understanding both the prior knowledge students have coming into physiology programs and the change in thinking students have when graduating from physiology is essential to design an effective instructional approach (3). It is clear that misconceptions arise from every individual's personal experience in the world of internally generated and hence perceptible forces and the perceived notion that results (4). The problem with misconceptions is that they are often quite persistent and they seriously interfere with the student's ability to learn physiology (5). Misconception hampers the process of knowledge construction. Misconceptions are defined as persistent ideas not supported by current scientific views (6). Understanding is sometimes sealed, 'held on to' and will be threatened by new input and other fellow mate's viewpoints and ideas (7). It brings attention to the complexity of interplay between different learning processes (8).

Previous research by Anna Fyrenius 2007 (7) was done on student's preconceptions as a qualitative, phenomenographic approach. The study concluded that the students are having good understanding of the physiological principles and they have different understanding of the subject for a deeper level of understanding for the medical physiology. Another study by Evangelia Karagiannopoulou 2010 (9) concluded that students appeared to make broader connections within deep approaches in relation to open book examinations and narrow connections to closed book examinations. The study by Joseph John Morgan 2016 (10) concluded that the increase in use of technology for academic and social interaction would create a new natural environment where students will participate.

The limitations of most previous research was being a qualitative study might not have brought to light the real reason behind the preconceptions which would have influenced their results and these studies failed to give clear understanding about the subject. The main aim of the study was to study the preconceived ideas of learning physiology among dental students of Saveetha dental college.

## **MATERIALS AND METHODS**

A self-administered questionnaire comprising about 10 questions was prepared and circulated through online among 100 Saveetha dental college students and the results were obtained. The statistics test used was student t test. The pros of the study are that a large number of data can be stored and is cost effective and easy to handle and cons are the options may not be available to the participants and their truthfulness cannot be tested. The independent variables of the study are height, weight, age and skin tone and the dependent variables of the study are student preconceptions, physiology, misconceptions. The method of representation of output variables is pie chart. The questionnaire was validated internally through 3 staff in the college and externally through 3 random persons and both are checked.

## **RESULTS AND DISCUSSION:**

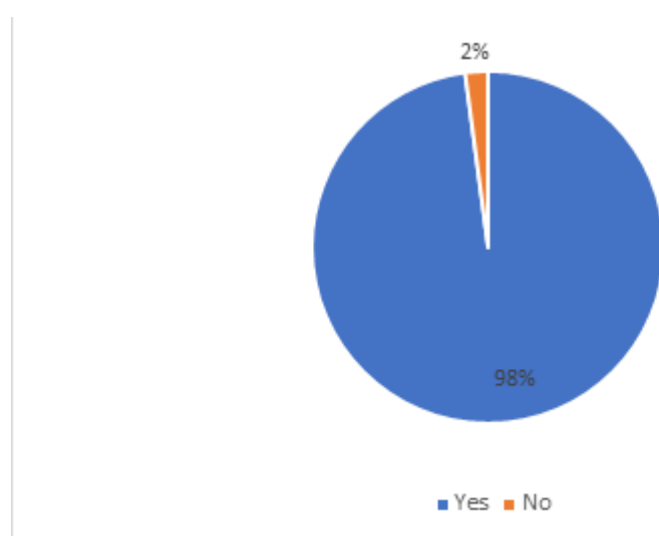
From the survey done it is found that most of the students have preconceived ideas about physiology (97.9%) (fig 1). It is also found that nearly half of the sample population have the thought that learning physiology would be as difficult as any other subject of dentistry (41.4%) (fig 2). However the students quite remarkably are convinced of the fact that learning physiology would help them in dentistry (85.9%) (fig 3) and further they feel that if guidance given they would feel the subject lighter (78%) (fig 4). Very interestingly they accept the fact that their idea about physiology would probably change after a period of time (78.4%) (fig 5), probably in a positive and more appreciable way. About 99% of students feel that availability of resource materials would enhance their learning (fig 6) which is very much acceptable and true when it comes to learning any subject. From fig 7 it is understood that about 94.9% of the students show interest to learn physiology and this would very much influence their learning skill as interest to learn things always makes learning to happen in a better way. It is this interest of the students to learn the subject that has made them to give positive responses (98%; refer fig 8) when asked whether innovative teaching methods would boost their interests to learn.

Previous research by Joel A Michael, 2002 (11) had given that one possible source of misconceptions is the student's inability to apply simple general models to specific phenomena and also supported by the study of Harold I Modell, 2000 (12) had concluded that if students recognize that these apparently different phenomena can be viewed as examples of the same general conceptual model, they may gain a more unified understanding of physiological systems. Another study by Saramarie Eagleton 2017 (13) had stated that emphasis is shifted from behavioural theories to cognitive theories and currently, it is the constructivist teaching strategies mostly used. The studies by LM Judd, et al 2017 (14) and K Ashwini, et al, 2019 (15) had given for successful classroom intervention, participation and engagement of students in flipped modules is essential and the study by Velda McCune, 2009 (16) had given that notion of the authentic learning experiences was used to illuminate student's perspectives on how key learning experiences influence the willingness to be engaged in their studies. The study by Evangelia Karagiannopoulou, 2010 (9) found out that the students appeared to make broader connections within a deep approach in relation to open book examinations and narrow connections to closed book examinations and associated with another study by Joseph John Morgan, 2016 (10) had given that if increase in use of

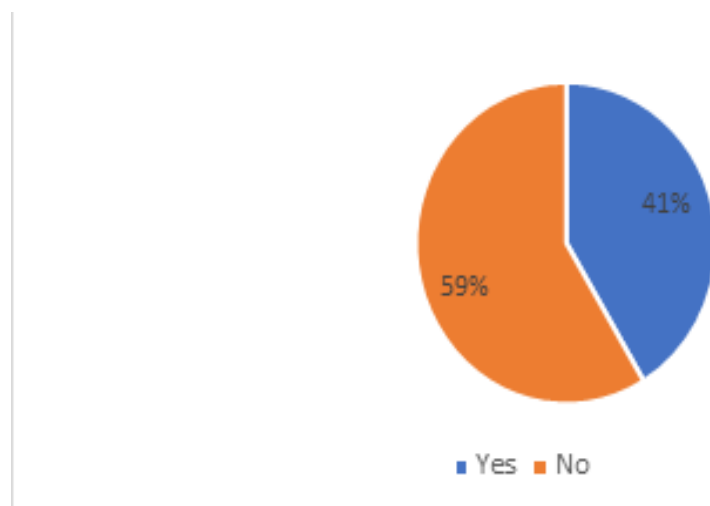
technology for academic and social interaction would create a natural environment where students would participate efficiently.

The limitations of the present study are that the study was done in a small scale population of 100 participants and in a homogeneous population. The participant truthfulness is not tested, so the results may be biased. The options may not be available for the participants to answer the question, so minimal error may be present.

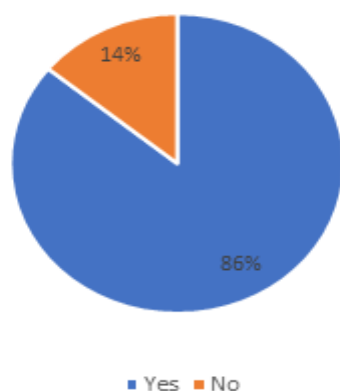
This study might be helpful in future in assessing the student's preconceived ideas about the physiology subject and its principles and thereby reducing the misconceptions of the subject by the students. For the upcoming years, the students would not develop a fear of the subject and will surely make them expertise in handling the physiological aspects of the patients by the future doctors.



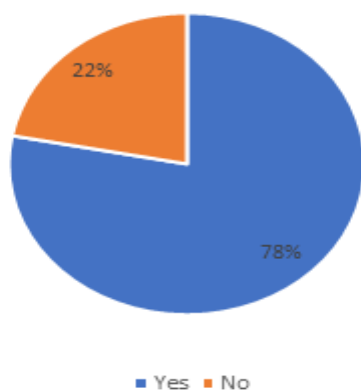
**Fig 1:** Graph depicting the basic idea about physiology. About 97.9% of the students have ideas about physiology and 2.1% don't have an idea about the subject.



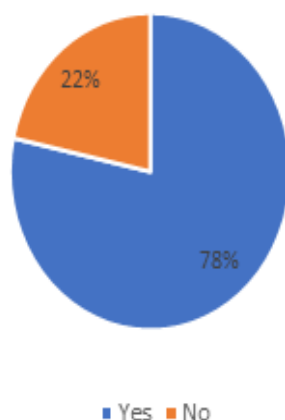
**Fig 2:** Graph showing the difficulty of learning physiology as any other subject in Dentistry and about 41.4% felt difficult but about 58.6% did not feel the same.



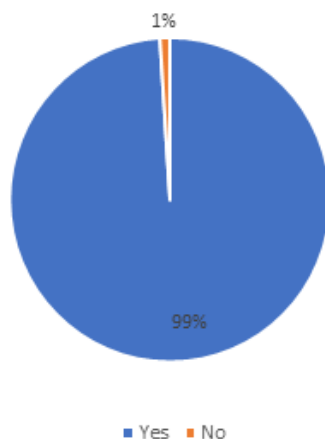
**Fig 3:** Graph showing that the students feel learning physiology would be helpful in dentistry. About 85.9% feel that learning physiology would be useful and 14.1% did not feel that learning physiology might not help.



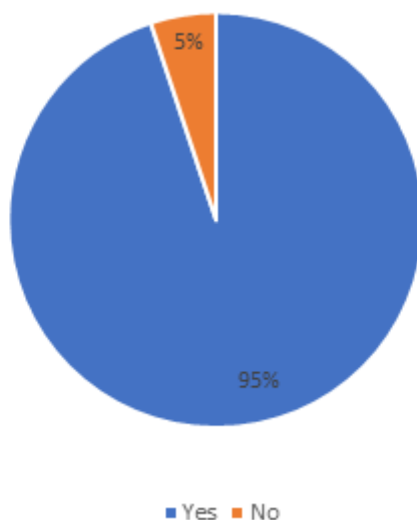
**Fig 4:** Graph showing that the students are interested in guidance learning of physiology. About 78% of the students are interested in guidance learning and 22% are not interested in it.



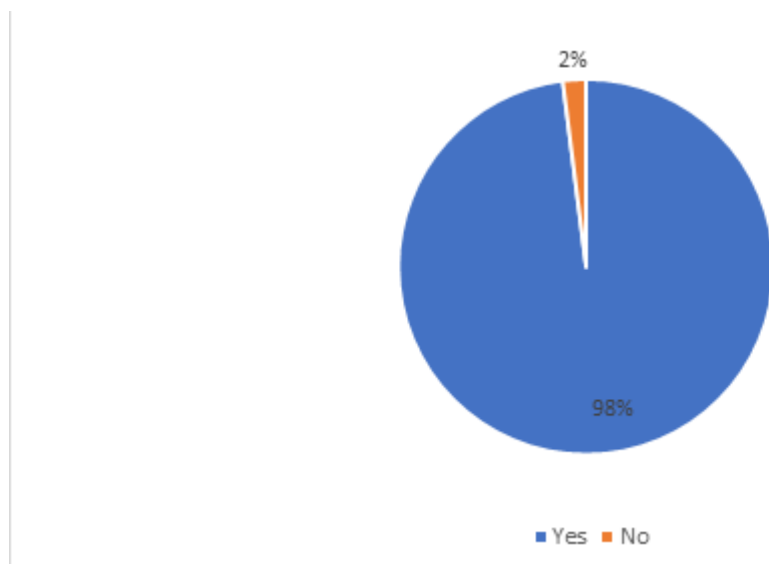
**Fig 5:** Graph showing that the students are motivated to learn physiology after a period of time. About 78.4% of students are motivated to learn physiology but 21.6% of them are not willing to learn physiology after a period of time.



**Fig 6:** Graph showing that the students feel that if proper resource materials are available, their learning would be enhanced. About 99% of the students felt that the availability of resource material will enable them to learn better and only a few of them, about 1% did not feel the same.



**Fig 7:** Graph showing that the students think that learning physiology would be interesting. About 94.9% of the students thought that learning the subject would definitely be interesting but 5.1% of them thought the opposite.



**Fig 8:** Graph showing that the innovative teaching methods would boost the student's interest to learn the subject. About 98% of the students accepted that innovative teaching methods would help them but about 2% did not accept this.

## CONCLUSION:

Prejudice and preconceived notions are actually a major problem of our brain. They create a “block” for free thought, and we become poor listeners and thinkers in the process. We should be aware of not to get caught in it as it may influence our learning process and may pose undue stress in learning the subject. Hence in order to facilitate learning the students should never be judgmental about any subject in fact and they should train themselves to be far away from preconceived notions.

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