

RESEARCH ARTICLE

Perceptions of medical students and physicians about the role and scope of physiology

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ABSTRACT


Background: The number of medically qualified teachers in physiology is decreasing critically in India due to less inclination of medical students toward basic sciences. This is due to decreased job and research opportunities, promotional avenues, and financial returns. Due to this reduction, the current teaching-learning methods in physiology apparently have an inadequate focus on the clinical importance and relevance. The transition between preclinical and clinical training is very stressful period because of inability of student to apply their preclinical knowledge to solve clinical problems. **Aim and Objective:** This study aims to analyze and compare the perceptions of medical students and physicians about the role and scope of physiology. **Materials and Methods:** This questionnaire-based study was conducted from October 2015 to March 2016. Hundred medical students and hundred physicians (with MBBS degree, practitioners) were selected by convenience sampling. Approval was taken from the Institutional Ethical Committee. Informed consent was taken from participants. The study questions were collected from the previous studies and questionnaire was modified according to our study needs. Finally, 15-item questionnaires was distributed to participants to answer. **Results:** All participants completed questionnaire showing a response rate of 100% which was statistically analyzed. There are positive perceptions of medical students and physicians about the role and scope of physiology. Teaching of physiology would be more effective if taught in integrated fashion. **Conclusion:** Decreased job opportunities, promotion avenues, academic growth, research opportunities, and financial returns in physiology were some of the main factors for its lower preference.

KEY WORDS: Physiology; Medical Students; Physicians, Perceptions; Integrated Teaching; Future Career Option

INTRODUCTION

Physiology deals about the physical, mechanical, and biochemical functions of living organism and its role in maintaining homeostasis. Physiology forms the very essential and core component of medical educational curriculum.^[1] The number of medically qualified teachers in

basic sciences such as anatomy and physiology is decreasing critically in India due to less inclination of medical students toward basic sciences.^[1,2] This decreased interest may be due to the reduction of preclinical duration from 18 months to 12 months and sudden reduction of teaching staff requirements in preclinical and paraclinical departments in medical colleges by apex bodies. These factors lead to decreased job opportunities, promotional avenues, academic growth, research opportunities, and financial returns.^[3] Due to drastic reduction in students is to teaching staff ratio, the current teaching-learning methods in physiology apparently have an inadequate focus on the clinical importance and relevance which later can lead to decrease in quality of medical education. As a result, the preclinical subjects have been sidelined, undervalued, and ignored by most clinicians

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as well as students because of its non-involvement in patients care, even though these form the core component of medical curriculum and foundation of good clinical practice.^[1-6] The transition between preclinical and clinical training is very stressful period because of inability of student to apply their preclinical knowledge to solve clinical problems.^[7] This has led to new form of curriculum in Western countries such as organ-specific lectures, early clinical exposure, and integrated teaching which helps in better understanding and application of basic physiological knowledge in patient care. Emphasis should be laid on highlighting the clinical importance related to each concept and principles taught in physiology.^[8-16] In spite of being so important and interesting, participants were not interested to take physiology as their future career.

Aims and Objectives

The objectives of the study were as follows:

1. To analyze the perceptions of medical students and physicians regarding the role and scope of physiology using questionnaire
2. To compare the perceptions of medical students and physicians regarding the role and scope of physiology.

MATERIALS AND METHODS

This qualitative, comparative, observational, and questionnaire-based study (non-invasive, non-interventional) was conducted from October 2015 to March 2016 in the Department of Physiology, Hassan Institute of Medical Sciences, Hassan. One hundred medical students and 100 physicians (with MBBS degree, practitioners) were selected for the study by convenience sampling. Approval was taken from the Institutional Ethical Committee (IEC NO: 59 Dated 01-01-2016). Informed consent was taken from participants for anonymous reporting of results. The study questions were collected from the previous studies^[1-4] and the questionnaire was modified according to our study needs. Finally, 15-item questionnaires after pre-validation and pre-testing were distributed to participant to answer. The completed questionnaire was coded to conceal the identity of participant and analyzed in anonymous manner. The final self-administered questionnaire requires approximately 15 min for answering. The 5-point Likert scale responses may be represented in a binomial form by summing agree and disagree responses separately. For statistical convenience, we used "YES" or "NO" response pattern. The data were collected and statistically analyzed.^[1-4]

Statistical Analysis

The data were suitably arranged into tables from the master chart for discussion under different headings. Analysis was performed using the Statistical Package for the Social Sciences software for Windows. Continuous variables were expressed as the mean \pm standard deviation and qualitative

data as percentages. Comparison of student and physicians' responses was performed using Student's *t*-test for unpaired data. Chi-square test was carried out to evaluate the significance in different groups and to examine associations between interest in physiology and other factors. The mean difference is significant at $P < 0.05$ level. Conclusion was drawn based on outcome of this statistical treatment.

RESULTS

A total of 100 medical students and 100 physicians (with MBBS degree, practitioners) participated in the study and answered the questionnaire showing a response rate of 100%. The responses of the participants and correlation of participants interest toward physiology and other factors are shown in Table 1 which go in support of many studies conducted earlier.^[1-4] All the 200 participants agreed that physiology is very important subject in medical education. About 92% of students and 99% of physicians showed interest in learning physiology. About 69% of students and 80% of physicians agreed that faculties are putting effort to make physiology interesting and exciting. About 51% of students and 83% of physicians found physiology easy to understand, study, retain, and reproduce. About 86% of students and 62% of physicians found that the time allotted of 1 year to learn physiology was not sufficient for in depth understanding of core components of medical education. About 76% of students and 84% of physicians admitted that physiology faculty's stresses on importance of physiology during lectures or practical classes. About 61% of students and 65% of physicians were interested in research in physiology. About 72% of students and 66% of physicians expressed that physiology faculties are not stressing on scopes of research in physiology during lectures or practical classes. About 71% of students and 63% of physicians said that physiology faculties are not encouraging students properly to involve in research projects. Hence, 73% of students and 89% of physicians wanted to receive more training sessions on research in physiology. About 98% of students and 99% of physicians agreed that physiological knowledge is very essential for understanding paraclinical and clinical subjects. About 100% of students and 99% of physicians agreed that strong physiological knowledge is essential for future patient care. About 92% of students and physicians wanted physiology to be taught with paraclinical and clinical subjects for better understanding (integrated teaching). About 80% of students and 75% of physicians were not interested to take physiology as their future career. About 80% of students and 75% of physicians admitted that the cause for not choosing physiology as their future career is decreased job opportunities, promotional avenues, and financial returns.^[1-4]

DISCUSSION

In the present study, all 200 participants answered the questionnaire showing a response rate of 100% compared

Table 1: Responses of the participants and correlation of participant's interest toward physiology and other factors^[1-4]

Questions	Students		Physicians		Significance
	Yes	No	Yes	No	
Is physiology important subject in medical education?	100	0	100	0	$\chi^2=0$, d.f=1, $P=0$
Are you interested in learning physiology?	92	8	99	1	$\chi^2=5.696$, d.f=1, $P<0.05$
Are faculties making physiology interesting and exciting?	69	31	80	20	$\chi^2=3.2$, d.f=1, $P>0.05$
Is physiology easy to understand, study, retain, and reproduce?	51	49	83	17	$\chi^2=23.5$, d.f=1, $P<0.05$
Is the time allotted of 1 year to learn physiology sufficient?	14	86	38	62	$\chi^2=15.38$, d.f=1, $P<0.05$
Do physiology faculties stress on importance of physiology during lectures or practical classes?	76	24	84	16	$\chi^2=2.0$, d.f=1, $P>0.05$
Are you interested in research in physiology?	61	39	65	35	$\chi^2=0.342$, d.f=1, $P>0.05$
Do physiology faculties stress on scopes of research in physiology during lectures or practical classes?	28	72	34	66	$\chi^2=0.84$, d.f=1, $P>0.05$
Do physiology faculties encourage students to involve in research projects?	29	71	37	63	$\chi^2=1.44$, d.f=1, $P>0.05$
Would you like to receive more training sessions on research in physiology?	73	27	89	11	$\chi^2=8.312$, d.f=1, $P<0.05$
Is physiological knowledge essential for understanding paraclinical and clinical subjects?	98	2	99	1	$\chi^2=0.87$, d.f=1, $P>0.05$
Is strong physiological knowledge essential for future patient care?	100	0	99	1	$\chi^2=1.004$, d.f=1, $P>0.05$
Do you want physiology to be taught with paraclinical and clinical subjects for better understanding (integrated teaching)?	92	8	92	8	$\chi^2=0$, d.f=1, $P=0$
Do you want to take physiology as your future career?	20	80	25	75	$\chi^2=1.048$, d.f=1, $P>0.05$
If no to previous question, is decreased job opportunities, promotional avenues, and financial returns cause for not choosing physiology as a future career?	80	20	75	25	$\chi^2=0.714$, d.f=1, $P>0.05$

to 75.7% in Bryant *et al.* study. All the 200 participants agreed that physiology is very important subject in medical education. Almost 99% agreed that strong physiological knowledge is essential for future patient care. However, still 77.5% of participants were not interested to take physiology as their future career. They admitted that the cause for not choosing physiology as their future career is decreased job opportunities, promotional avenues, and financial returns.

In the present study, physiology as a subject was overall perceived positively by 95% of participants and only 22.5% wanted to take physiology as a career which was similar to Bryant *et al.* study.^[1] Yamazaki *et al.* observed that 24.5% of respondents were interested in basic sciences and half of them considered basic science as their future career.^[2] Nearly 98.5% of participants agreed that physiological knowledge is very essential for understanding paraclinical and clinical subjects and 92% of participants wanted physiology to be taught integrated with other subjects for better understanding (integrated teaching). This helps to maintain continuity of the subject till final year and favorably influence students' attitudes toward basic sciences.^[3] Gaikwad *et al.* concluded that involvement of physiologist in clinical teaching is required. There should be regular training courses to improve teaching skills.^[4] About 69% of participants expressed that physiology faculties are not stressing on scopes of research in physiology during lectures or practical classes compared to 62% in other studies. Women physicians took more efforts in inspiring medical students to be interested in research. In addition, basic science may be a good career path for women physicians to follow.^[5] This

supports to the hypothesis that modification in educational methods and primary care experience can favorably influence students' attitudes toward basic sciences.^[6,7] Early clinical exposures were better learning methodology than traditional teaching for medical students in Indian scenario. However, it requires extra efforts and coordination with clinical department and consumes more time, infrastructure, and workforce.^[8,9] Students' retention of basic sciences during clinical years is generally poor. About 21.5% of students wants revisiting basic sciences in the final year to enhance understanding of clinical subjects and to understand how the two fields integrate.^[10] Patel *et al.* found that 83% of faculties have positive attitude toward teaching and learning evidence-based medicine, early clinical exposure, and integrated teaching.^[11] Wide spread faculty development programs are essential for successful implementation of early clinical exposure and integration modules.^[12] Clinically, oriented physiology teaching is another strategy for developing and encouraging critical thinking skills in medical students.^[13] Students learn and understand better in context of medical problem integrating with basic sciences and correlate basis of clinical problem than the regular didactic method.^[14-16] This is reflected in our study where 92% of participants preferred integrated teaching. In spite of being so important and interesting, only 22.5% of participants were interested to take physiology as their future career which is similar to earlier study.^[1] Studies were conducted to find out what factors predict medical students career choice. Factors include gender, actual aptitude for the specialty, individual perceptions, financial rewards, and scope for research, role models, and expected income.^[17,18] Teachers, the formal

transmitters of skills and knowledge as role models, and the learning environment are critical to effective education.^[19,20] Here are some recommendations to overcome these strength and limitations, duration of preclinical years should be increased to 18 months from 12 months so that students can spend more time in preclinical course and understand basic subjects better. Teaching staff requirements in the physiology department should be increased in medical colleges by apex bodies. Job opportunities should be increased, time bound promotion, academic growth, and financial returns should be improved for basic science physicians. The physiology department should conduct seminars, attractive curriculum activities to attract student's interest. Government has to increase the quota of medical students entering physiology department. Scholarships should be offered to students joining physiology. Special grants should be allotted to develop basic sciences departments.^[1-4]

This study has some limitation. Some of the factors such as larger sample size, teaching-learning methodology followed in the institution, and role models were not included in our study and can be considered in future studies.

CONCLUSION

Overall, there is positive perceptions of medical students and physicians about the role and scope of physiology. Teaching of physiology would be more effective if taught in an integrated fashion. Decreased job openings, promotion avenues, academic growth, research opportunities, and financial returns in physiology were some of the main factors for the lower preference for these subjects.^[1-4]

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