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Perceptions of Post-graduate Students Towards M.D. Physiology Curriculum in India

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Abstract

In India, the system of postgraduate (PG) medical education has suffered due to long-term neglect. A comprehensive review of the curriculum of PG courses has not taken place for several decades. Whatever changes have been made are marginal and have had little overall impact. In spite of societal need and dearth of physiologist, there is an observation that there hardly any takers for M.D. Physiology. The above facts compel the need into rethinking the training and curriculum designing of M.D. Physiology curriculum in India. The aim of the present study was to assess the perception of M.D. physiology students toward the present curriculum which will help in gaining an insight in further curriculum planning. A questionnaire based on the objectives of M.D. Physiology curriculum was administered to post-graduate students from different parts of the country. The results showed that though the curriculum is addressing the teaching needs of post-graduate M.D. Physiology students, it is not preparing them adequately as a researcher.

Introduction

The curriculum is well understood as a planned learning experience (1). The curricula of medical schools need to be regularly updated to reflect the latest advances in basic science and clinical care in order to improve the attitude of medical students towards the newer trends in medical education (2). The first step in designing a curriculum is to identify and characterize the healthcare problem that is currently being addressed by the curriculum. It is

then necessary to determine the gap between the current approach to the problem and the ideal approach to the problem. This process known as 'needs assessment' is one of the key steps in curricular development. It is necessary to take into consideration the current and perceived ideal roles of each of the stakeholders' viz. patients, medical professionals, health care educators and society in dealing with the healthcare problem (1). Physiology is one of the foundation sciences for the medical curriculum. It forms the basis of all life sciences. In fact, in the preface to the first edition of their book 'Physiological Basis of Medical Practice', Charles Herbert Best and Norman Burke Taylor wrote in 1938, "The physiologist can play a part in giving the student and practitioner advantage point from which he may gain a rational view of pathological processes" (3). Curriculum in basic sciences should be designed

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such that the medical student is imparted knowledge which enables him to become a competent physician (6). Over the past several years opinions have emerged that the curricula in medical schools in India have failed to meet the objectives for which they were instituted. Also medical faculty have expressed the opinion that the students are being taught practicals which they will never apply or practice in future (7, 8) and that there is no synchronization with the modern methods and recent advances in biomedical sciences (7).

In India, the system of postgraduate (PG) medical education has suffered due to long-term neglect. While a major revision of the undergraduate curriculum by the Medical Council of India (MCI) took place in 1997, a comprehensive review of the curriculum of PG courses has not taken place for several decades. Whatever changes have been made are marginal and have had little overall impact.

The current seats available in M.D. Physiology is approximately around 600 and projected needs will be 4800 and 6000 by year 2020 and 2030 respectively (7).

In spite of societal need and dearth of physiologist, there is an observation that there hardly any takers for M.D. Physiology. The M.D. Physiology seats have gone vacant in many colleges even at premier institutes. Secondly, doctors who have got M.D. Physiology are been reported to work as medical officers and some find difficulty in getting jobs in physiology related jobs in academia, research institute and corporate sector. The above facts compel the need into rethinking the training and curriculum designing of M.D. Physiology curriculum in India. With this in mind, we decided to study stakeholders' perception of M.D. Physiology curriculum.

The aim of the present study was to assess the perception of M.D. physiology students toward the present curriculum which will help in gaining an insight in further curriculum planning.

Material and Methods

It was a cross-sectional, face to face questionnaire based study. Institutional ethical committee permission was obtained. The sample size was 50. The sampling technique was snowball and convenience sampling. The subjects were post-graduate students of M.D. Physiology course from medical colleges all over India. The study duration was 6 months.

A questionnaire based on the objectives of curriculum was prepared. It also included information about the state where the residency was being pursued, whether it was a private or government medical college and the year of residency. The questionnaire was validated by focus group discussion with senior faculty from Physiology. Reliability and internal consistency of questionnaire was determined by using Cronbach α test in a pilot study. Cronbach α value for the questionnaire was determined to be 0.86. This is > 0.7 , which indicates acceptable internal consistency (8).

Data collection was done by administering the questionnaire to the post-graduate students who attended the national conference for physiology (APPICON – 2015) held at AIIMS, Jodhpur and workshops and CMEs in the year 2015. This ensured representation from different parts of the country. Consent was taken before administering the questionnaire. Compilation, coding and de-coding of data and statistical analysis was done using MS Excel.

Result

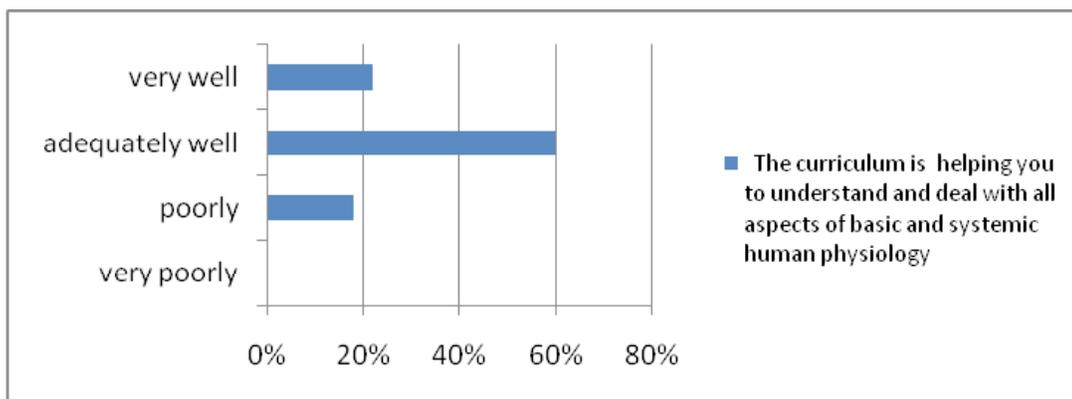
The demographic data was analysed and it was found that of the 50 respondents, 66% were females and 34% were males. The respondents were 28%, 36% and 36% were from first, second and third year respectively. The students belonged to different states as represented by Table-I.

The current curriculum helps in conducting relevant

TABLE I: State-wise distribution in percentage.

State	%
Andhra Pradesh	2
Bihar	2
Delhi	10
Haryana	6
Himachal Pradesh	4
Karnataka	6
Kerala	2
Madhya Pradesh	4
Maharashtra	28
Odisha	4
Puducherry	2
Punjab	4
Rajasthan	8
Telangana	2
Tamil nadu	4
Uttar Pradesh	8
West Bengal	4

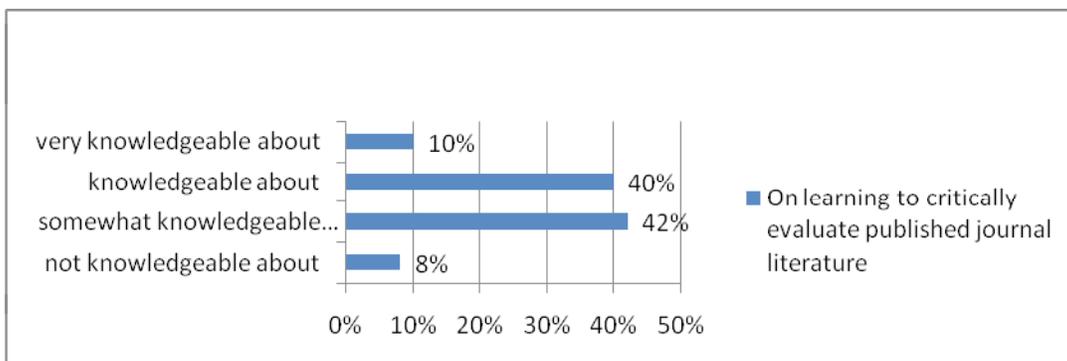
clinical/experimental research as would have significant bearing on human health and patient care is agreed by 60% and disagreed by 40% students. 84% agreed that the curriculum increased their ability to select and use appropriate teaching techniques and resources. 80% agreed that the curriculum helped them to function as an effective member of a teaching or research team. 86% students agreed that the curriculum prepares them to effectively teach undergraduate medical students, the basic physiological mechanisms in health and disease. 74% students said they could use the use the library facilities including computer, CD ROM and internet research effectively. 70% of student agreed the laboratory exercises helped them to increase critical



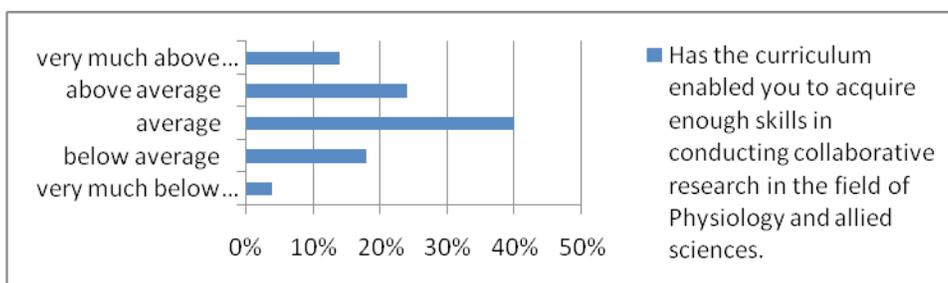
Graph 1: Understanding of basic and systemic human physiology. 60% of students concurred the current M.D. Physiology curriculum allowed them to understand and deal with all aspects of basic and systemic human physiology.

TABLE II: Perceptions towards teaching and research aspects of M.D. Physiology Curriculum.

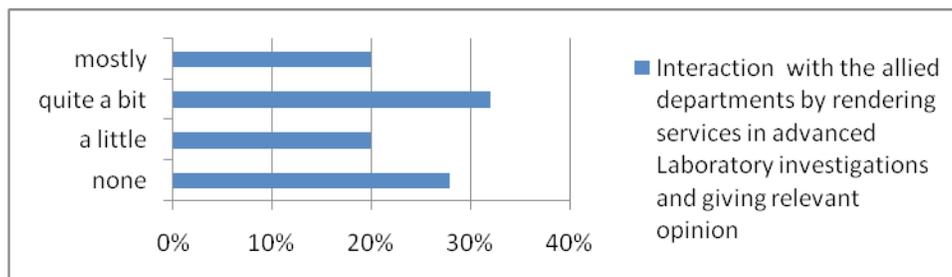
	Strongly Disagree (%)	Disagree (%)	No opinion or uncertain (%)	Agree (%)	Strongly Agree (%)
Conducting relevant clinical/experimental research as would have significant bearing on human health and patient care	0	16	24	38	22
Ability to select and use appropriate teaching techniques and resources	0	8	8	56	28
To function as an effective member of a teaching or research team	0	4	16	56	24
Effectively teach undergraduate medical students, the basic physiological mechanisms in health and disease	0	6	8	68	18
Effectively use the library facilities including computer, CD ROM and internet research	0	12	14	48	26
The laboratory exercises helped to increase critical thinking	0	4	26	56	14
The laboratory exercises helped to increase problem solving skills	0	4	30	54	12



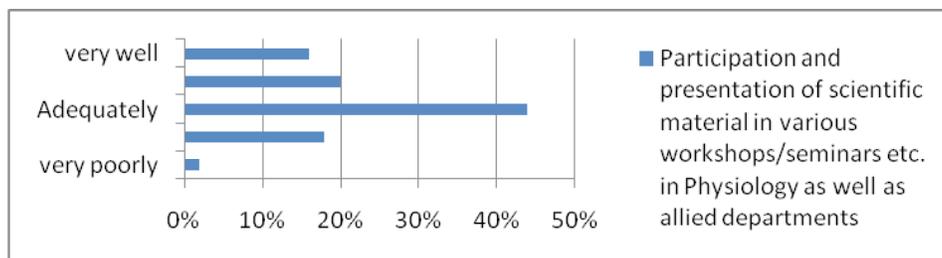
Graph 2: Perception about ability to critically evaluate published literature. 50% of students felt that the curriculum did not help them to critically evaluate published journal literature.



Graph 3: Perception about acquiring skills in conducting collaborative research. Only 38% of students felt that the curriculum enabled them to acquire above average skills in conducting collaborative research in the field of Physiology and allied sciences.



Graph 4: Perception about interacting with allied department. Only 52% felt that they could interact enough with allied departments by rendering services in advanced laboratory investigations and giving relevant opinion.



Graph 5: Perceptions about participation and presentation of scientific material. 80% of students participated and presented scientific material in various workshops or seminars in Physiology and allied departments.

thinking whereas 30% did not feel so. 68% felt that the laboratory exercises helped to increase problem solving skills whereas 34% disagreed.

Discussion

Our study was focused on perception of M.D. Physiology students toward their current curriculum. This study can be used as a tool for curriculum revision activities which is need of the hour. The system of postgraduate (PG) medical education has suffered due to long-term neglect. While a major revision of the undergraduate curriculum by the Medical Council of India (MCI) took place in 1997, a comprehensive review of the curriculum of PG courses has not taken place for several decades. Whatever changes have been made are marginal and have had little overall impact. There is paucity of literature on various aspects of M.D. Physiology curriculum in India. Therefore we tried to understand students' perspective of M.D. Physiology curriculum which may be preliminary step towards curricular reform.

In our study there were 50 respondents of which 66% were females and 34% were males and 28%, 36% and 36% were from first, second and third year respectively. The study group was from 17 states of India as depicted by table 1. Our findings showed that 60% of students concurred the current M.D. Physiology curriculum allowed them to understand and deal with all aspects of basic and systemic human physiology. The current curriculum helps in conducting relevant clinical/experimental research as would have significant bearing on human health and patient care is agreed by 60% and disagreed by 40% students. 84% agreed that the curriculum increase their ability to select and use appropriate teaching techniques and resources. 80% agreed that the curriculum helped them to function as an effective member of a teaching or research team. 86% students agreed that the curriculum prepares them to effectively teach undergraduate medical students, the basic physiological mechanisms in health and disease. 74% students said they could use the use the library facilities including computer, CD ROM and internet research effectively. 70 % of student agreed the laboratory exercises helped them to increase critical thinking whereas 30% did not feel

so. 68% felt that the laboratory exercises helped to increase problem solving skills whereas 34% disagreed. 50% of students felt that the curriculum did not help them to critically evaluate published journal literature. Only 38% of students felt that the curriculum enabled them to acquire above average skills in conducting collaborative research in the field of Physiology and allied sciences. Only 52% felt that they could interact enough with allied departments by rendering services in advanced laboratory investigations and giving relevant opinion. The main objectives of physiology curriculum are to inculcate and develop various skills in teaching as well research. The results of our study show that, most students felt that the curriculum was adequately framed to help them to understand the basic and systemic physiology and grooms them well for teaching Physiology. The study also revealed that research and research related aspects (collaborative research, critical appraisal of papers) were not adequately dealt with in their current curriculum.

The students also felt that there was little interaction with allied departments. The current study shows that though the curriculum is addressing the teaching needs of post-graduate M.D. Physiology students, it is not preparing them adequately as a researcher. Physiology is an experimental, scientific discipline and is of central importance in medicine and related health sciences. As per excerpts of an interview with renowned physiologist Dr. John Hall, published in *Perspective Medical Education* (14), he stresses that Physiology will continue to be an exciting field of research for a long time. Therefore research training during M.D. Physiology curriculum has to be stressed upon and curricular reforms have to be taken accordingly. Even if research experience as a student does not lead to a career in academic medicine, the experience can help improve a student's skills in searching and critically appraising the medical literature and independent learning (15). Such exposure to research as a student can also help identify future careers, establish important contacts and secure better career opportunities (16).

The limitations of our study were that we investigated the broad objectives of the curriculum, so the causes for a finding could not be established. Also the sample

size is limited because of lack of support. The study can form the basis of curricular reforms required in M.D. Physiology in India so that it becomes more relevant in terms of contributing towards research as well as teaching. Further studies of needs assessment can be done by taking perceptions of faculty in Physiology who form another important stakeholder.

Conclusion

Thus, the present study provides a 'needs assessment' for reforming the current M.D.

physiology curriculum based on the results which show a definite lack of research training. It also highlights the need to frame the curriculum in a way which encourages critical thinking and improves problem solving skills in the post-graduate students of M.D. Physiology.

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References

1. Kern DE, Thomas PA, Hughes MT, editors. Curriculum development for medical education: A six-step approach, 2nd ed. Baltimore: The John Hopkins University Press, 2009; p. 5 (1).
2. Diamond RM. Designing and assessing courses and curricula. San Francisco: Josey-Bass Publishers; 1988 (2).
3. Tandon OP, Tripathi Y, editors. Best and Taylor's Physiological basis of medical practice, 13th ed. Lippincott Williams and Wilkins, 2011, p. vii.
4. Khromova V, Gray TA. Learning needs in clinical biochemistry for doctors in foundation years. *Ann Clin Biochem* 2008; 45: 33–38.
5. Dandekar SP, Maskane SN, Mckinley D. A survey validation and analysis of undergraduate medical biochemistry practical curriculum in Maharashtra. *Ind J Clin Biochem* 2012; 27(1): 52–60.
6. Hariharan TS. Need for changes in the practical pharmacology curriculum of medical undergraduates. *Indian J Pharmacol* 2004; 36: 181.
7. N Ananthakrishnan, NK Arora, G Chandy, B Gitanjali, R Sood, A Supe, S Nagarajan. Is there need for a transformational change to overcome the current problems with postgraduate medical education in India? *Natl Med J India* 2012; 25: 101–108.
8. Bland JM, Altman DG. Statistics notes : Cronbach's alpha. *BMJ* 1997; 314: 572.
9. Streiner DL, Norman GR. Health measurement scales : a practical guide to their development and use. Oxford : Oxford University Press; 2003.
10. Tigelaar DEH, Dolmans DHJM, Wolhagen HAP, Van der Vleuten CPM. The development and validation of a framework for teaching competencies in higher education. *High Educ* 2004; 48: 253–268.
11. Syed Ilyas Shehnaz, Jayadevan Sreedharan. Does curricular change improve faculty perceptions of student experiences with the educational environment? A preliminary study in an institution undergoing curricular change, *Journal of Educational Evaluation for Health Professions*, 2014, 11: 7, <http://dx.doi.org/10.3352/jeehp.2014.11.7>
12. Omna Chawla, Manasi Bhattacharjee, Naveen K. Kansal, Students' perspective of the MBBS Physiology curriculum, *South East Journal of Medical Education*, Vol.6 no.2, 2012.
13. Lamis Kaddam, Mustafa Khidir, Mustafa Elnimeiri. Students' perceived value of physiology course activities in a Sudanese medical faculty, *Advances in Physiology Education* Published 1 December 2012 Vol. 36 no. 4, 298–301 DOI: 10.1152/advan.00070.2012
14. Ahmed H Adi, HJ Alurkhmani. Physiologically lucky: the role of medical physiology in modern medical education, *Perspective Medical Education* (2013), 2: 99–103.
15. Frishman WH. Student research projects and theses: should they be a requirement for medical school graduation? *Heart Dis* 2001; 3(3): 140–144.
16. Houlden RL, Raja JB, Collier CP, Clark AF, Waugh JM. Medical students' perceptions of an undergraduate research elective. *Med Teach* 2004; 26(7): 659–661.

Annexure : 1
STUDENT'S QUESTIONNAIRE

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- | | |
|---|--|
| <p>1. You belong to which state?</p> <p>2. The institute you are working for is – Government, Private, Defence, Semi-government</p> <p>3. Your year of residency –</p> <p>4. You are – M/F</p> <p>5. Is the curriculum helping you to understand and deal with all aspects of basic and systemic human physiology?
Very poorly Poorly Adequately Well Very well</p> <p>6. Are you conducting relevant clinical/experimental research as would have significant bearing on human health and patient care?
Strongly
Disagree
Disagree
No opinion or uncertain
Agree
Strongly agree</p> <p>7. Are you learning to critically evaluate published journal literature?
Not knowledgeable about
Somewhat knowledgeable about
Knowledgeable about
Very knowledgeable about</p> <p>8. Has the curriculum enabled you to acquire enough skills in conducting collaborative research in the field of Physiology and allied sciences?
Very much below average
Below average
Average
Above average
Very much above average</p> <p>9. Has the curriculum enabled you to select and use appropriate teaching techniques and resources?
Strongly
Disagree
Disagree
No opinion or
Uncertain
Agree
Strongly agree</p> <p>10. Do you think you can function as an effective member of a teaching or research team?
Strongly disagree
Disagree
No opinion or
Uncertain
Agree
Strongly agree</p> | <p>11. Can you effectively teach undergraduate medical students, the basic physiological mechanisms of the human body, with reference to pathophysiological processes of diseases and the physiological basis of their management?
Strongly disagree
Disagree
No opinion or uncertain
Agree
Strongly agree</p> <p>12. Are you trained to effectively use the library facilities including computer, CD ROM and internet research?
Strongly disagree
Disagree
No opinion or uncertain
Agree
Strongly agree</p> <p>13. Interact with the allied departments by rendering services in advanced laboratory investigations and giving relevant opinion.
None
A little
Quite a bit
Completely</p> <p>14. Did you participate and present scientific material in various workshops/seminars etc. in Physiology as well as allied departments.
Very poorly
Poorly
Adequately
Well
Very well</p> <p>15. The laboratory exercises helped to increase critical thinking.
Strongly disagree
Disagree
No opinion or uncertain
Agree
Strongly agree</p> <p>16. The laboratory exercises helped to increase problem solving skills.
Strongly disagree
Disagree
No opinion or uncertain
Agree
Strongly agree</p> |
|---|--|
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