

Original Research

Medical Students' View about the Effects of Practical Courses on Learning the General Theoretical Concepts of Basic Medical Sciences

Hossein Mazouchian^{1,2}, Leila Roshangar^{3*}, Fariba Salek Ranjbarzadeh¹, Reza Piri⁴, Mahdi Karimi Shoar⁴, Leila Rasi Marzabadi⁴

¹ Medical Education Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

² Student Research Committee, Student Research Center, Tabriz University of medical sciences, Tabriz, Iran

³ Neuroscience research Centre, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

⁴ Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

Article info

Article History:

Received: 10 Oct 2013
Accepted: 21 Feb 2014
ePublished: 29 May 2014

Keywords:

General Practitioner students,
Practical classes,
Theoretical courses

Abstract

Introduction: The basic medical sciences section requires 2.5 years in the medical education curriculum. Practical courses complement theoretical knowledge in this period to improve their appreciation. Despite spending lots of disbursement and time, this period's efficacy is not clearly known.

Methods: One hundred thirty-three General Practitioner (GP) students have been included in this descriptive cross-sectional study and were asked by questionnaire about the positive impact of practical courses on learning theoretical knowledge. Data were analyzed by descriptive statistics.

Result: The agreement in "Practical Head and Neck Anatomy" was $40.91\% \pm 29.45$, in "Practical Trunk Anatomy" was $63.62\% \pm 2.32$ and in "Practical Anatomy of Extremities" was $56.16\% \pm 2.57$. In "Practical Histology", agreement was $69.50\% \pm 2.19$; "Practical Biophysics" was $45.97\% \pm 2.25$, "Practical Physiology" $61.75\% \pm 2.17$; "Practical Biochemistry" $36.28\% \pm 2.42$; "Practical Pathology" $59.80\% \pm 2.53$; "Practical Immunology" $56.25\% \pm 26.40$; "Practical Microbiology and Virology" $60.39\% \pm 2.27$ and "Practical Mycology and Parasitology" $68.2\% \pm 2.16$.

Conclusion: GP students in Tabriz University of Medical Sciences are not optimistic about the applicability of practical courses of basic medical sciences lessons.

Introduction

There is always significant concern among students regarding the establishment of a strong link between what they are taught in theoretical classes and practical experience; the development of knowledge and skills are important because none of them will be useful without the other. In medical education as well as theoretical training, the intent of practical classes is to help students gain skills. In basic medical sciences (preclinical) sections, like other sections of medical education, there are some practical lessons as well as theoretical courses, and every year a significant amount of money is spent to prepare equipment and laboratory instruments for them.¹

Unfortunately, it has been claimed by researchers that medical students have a negative view on basic medical sciences sections because they think that there is no functional congruence between what they are taught and their future needs as a physician.² Lack of coordination between the contents of clinical and basic medical sciences courses has been expressed as a cause of this negative view.³ Interns are not positive about the application of basic medical sciences

lessons in their practice.⁴ However, far too little attention has been paid to the survey efficacy of applied classes on learning theoretical contents based on the medical students' views. This issue is very important in Tabriz University of Medical Sciences, Tabriz, Iran, because an integration system has not yet been implemented there. Absolutely the best way to solve this problem is to ask the students themselves.

This paper aimed to evaluate students' opinions about the effect of different practical classes on their learning abilities separated by need microscopy, 3-dimensional imaginations, and laboratory working to notify medical education authorities to change education policies and curricula in order to save costs and time, if required.

Materials and Methods

In this descriptive-cross sectional study, 133 General Practitioner (GP) students were willingly recruited. Study population consisted all of the GP students. The sample was randomly selected based on Cochran's formula. Inclusion criterion was passing a basic sciences exam because questions

*Corresponding authors: Leila Roshangar, Email: lroshangar@yahoo.com

© 2014 The Authors. This is an Open Access article distributed under the terms of the Creative Commons Attribution (CC BY), which permits unrestricted use, distribution, and reproduction in any medium, as long as the original authors and source are cited. No permission is required from the authors or the publishers.

were taken from all practical lessons of basic medical sciences courses. Exclusion criterion was failing to pass some of basic medical sciences section's courses. The data gathering tool was a researcher-made questionnaire. The validity of the questionnaire was determined using the expert opinion method by professors of the medical education department of the Education Research and Development Centre (EDC) of Tabriz University of Medical Sciences. Reliability was confirmed by SPSS-16 software and Cronbach's alpha coefficient calculated 0.9.

The questionnaire included five questions in each field (head and neck anatomy, trunk anatomy, anatomy of upper and lower extremities, biophysics, physiology, biochemistry, immunology, pathology, microbiology, parasitology and histology). In each field, questions were designed in such a way that measure student's agreement about the positive impact of practical courses on theoretical knowledge.

In the other questions, we asked students about the positive impact of practical classes on their theoretical knowledge generally. This question was separated by need: microscopy, 3-dimensional imaginations, and laboratory work.

In another question, students were asked to answer how much they believe that teaching laboratory experiments procedures should be replaced by the teaching interpretation methods of para-clinic results.

The last question of questionnaire was about student agreement on the teaching interpretation method of laboratory sciences, anatomical sciences and microscopy instead of teaching their procedures separately.

The questionnaire was designed with a Likert scaling to measure agreement, rating very high, high, medium, low and very low. The scale of agreement about the positive impact of practical courses on theoretical knowledge was classified into five groups according to percentage: very high (80-100), high (60-80), medium (40-60), low (20-40), and very low (0-20).

Data management and analysis was performed using SPSS 16 with descriptive statistics (percentage, Mean \pm SD)

Results

Of the study population, 114 students completed and returned the questionnaire. Three questionnaires were excluded because of irrelevant answers. 48.64% of respondents were male and 45.95% were female. 4.05% did not mention their gender. Pre-academic average of subjects was 19.20 \pm 0.51.

There was no significant relationship between students' opinions and their pre-academic average (P value > 0.05).

The agreement in "Practical Head and neck Anatomy" was 40.91% \pm 29.45, in "Practical Trunk Anatomy" was 63.62% \pm 2.32 and in "Practical Anatomy of Extremities" was 56.16% \pm 2.57.

The agreement in "Practical Histology" was 69.50% \pm 2.19; "Practical Biophysics" was 45.97% \pm 2.25; "Practical Physiology" was 61.75% \pm 2.17; "Practical Biochemistry" was 36.28% \pm 2.42; "Practical Pathology" was 59.80% \pm 2.53; "Practical Immunology" was 56.25% \pm 26.40; "Practical Microbiology and Virology" was 60.39% \pm 2.27 and "Practical Mycology and Parasitology" was 68.2% \pm 2.16.

Student's agreement with about the positive impact of

practical classes on theoretical knowledge about histology, physiology, microbiology and virology, and parasitology and mycology was high.

Their agreement about the positive impact of head and neck anatomy, pathology, immunology and biophysics was medium. Finally, their agreement about positive impact of practical biochemistry was low.

In the question in which we asked GP students about their agreement with the positive impact of practical classes on their theoretical knowledge generally, their agreement was 64.07% \pm 16.38 (high) in the courses which need microscopy, 53.58% \pm 22.14 (medium) in courses which need 3D imaging, and 50.04% \pm 17.29 (medium) in courses which require laboratory work.

In another question in which we asked students about teaching interpretation instead of teaching testing methods, agreement was 81.58% \pm 1.61, which is considered very high.

In the last question, student agreement about the necessity of the teaching interpretation method of para-clinic in anatomical sciences was 75.73% \pm 27.44 (high), 64.73 \pm 19.95 (high) in laboratory sciences, and 75.3% \pm 21.50 (high) in microscopy.

Discussion

Prediction and determination of educational needs are the most difficult and important parts of educational planning for each academic degree.⁵ Student satisfaction for these educational services is the most reliable criteria to measure their effectiveness.⁶

Our findings, derived from student's viewpoints, show overall agreement with the positive impact of practical classes on learning theory knowledge. Our findings replicate findings of another study done at Qazvin University of Medical Sciences in which they concluded that medical students were more inspired to learn practical-theoretical skills than theoretical alone.¹

We discovered that GP students believe that practical learning of microbiology and physiology can help in learning their theory, among other medical basic sciences courses. These findings are similar to the findings of Hassanzadeh et al.,³ but are also in conflict with their results about histology. Our study population agrees with the positive effect of practical histology on learning its theory, but in their study, the degree of agreement was low. Finding the cause of this conflict was not possible with our study. We also have similar results to them regarding the low effect of practical biochemistry.

In another similar study conducted at Qazvin University of Medical Sciences, a similar result has been obtained. In this study, dental students were asked their viewpoint. They believed that learning biophysics and biochemistry did not supplement their future needs as dentists.⁷

In Tehran and Shahid Beheshti universities of medical sciences, dental students were asked about the applicability of basic medical sciences courses in their professional future, and the authors found similar results in biochemistry and biophysics.⁸ Learning both practical and theoretical biochemistry is necessary for students of biomedical sciences, which means that a negative perspective is not justified.

In another section of our study, we asked students' opinions

about teaching interpretation methods and clinical views of basic medical sciences instead of teaching fundamental methods of testing. The agreement between students was very high. We can infer from these results that teaching practical basic medical sciences courses are far from para-clinic and do not provide for students' future needs as physicians and may even waste their time and government funds. There was a high level of agreement in all three parts: anatomical sciences, laboratory sciences and microscopy, which also support this idea.

Another view of the results can also be deduced; despite the fact that it may be necessary for medical students to learn the fundamental methods of testing and laboratory procedures in basic medical sciences, they have negative view on practical courses of this medical education section. If so, the cause must be found.

Conclusion

Students in Tabriz University of Medical Sciences are not optimistic about the applicability of basic medical sciences practical courses. Finding the cause of this negative view is a possible subject for other studies.

Ethical Issues

Participants' information was kept confidential.

Competing interests

The authors declare that there is no conflict of interests.

References

1. Mehr-Mohammadi M. [Curriculum: views, attitudes and perspectives]. Tehran: Ministry of Culture and Islamic Guidance Publication;2008.
2. Hassanzadeh S, Amini A, Shagagie A, Hassanzadeh P. [Medical students points of view on clinical skill lab function in 8 month period]. Iranian Journal of Medical Education 2002;2:27-8.
3. Hassanzadeh Gh, Alipour Haydari R. [Attitude of medical students at clinical sections of Qazvin Medical University toward the application of basic sciences courses]. The Journal of Qazvin University of Medical Sciences 1999;9: 67-70.
4. Emami SMH, Rasoolinejad M, Changiz T, Afshinnia F, Zolfaghari B, Adibi P. [Interns' view about basic medical sciences: their knowledge and attitude to national comprehensive exam and basic medical courses in Isfahan University of Medical Sciences]. Iranian Journal of Medical Education 2000;1:21-5
5. Geissberger MJ, Jain P, Kluemper GT, Paquette DW, Roeder LB, Scarfe WC, Potter BJ. Realigning biomedical science instruction in predoctoral curricula: a proposal for change. J Dent Educ 2008;72:135-41.
6. Mohammadpour A, Matlabi M. [The survey of the Gonabadmedical sciences students' views on their educational needs and improving theoretical and clinical education program (2001-2002)]. Iranian Journal of Medical Education 2002;2:41.
7. Alipour Haydari M, Hassanzadeh GhR, Hajisaiedjavadi Z. [Attitude of dentistry students at clinical sections of Qazvin medical university toward the application of basic sciences courses]. The Journal of Qazvin University of Medical Sciences 2002;6:38-42.
8. Ansari G, Hosseini-Nejad S. [Students' impressions on clinical applications of basic science courses (2003-5)]. The Journal of Islamic Dental Association of Iran (JIDA) 2008; 20:65-9.