

# Effectiveness of practical lab classes of basic sciences for doctors during clinical practice: KAP

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## **Abstract:**

### **Objective:**

The aim of this study is to assess how beneficial are practical lab classes of basic sciences for medical practitioners during their clinical practice.

### **Methods:**

A cross-sectional study using non-probability convenient sampling was conducted among 150 practicing doctors in **FMU, Allied and DHQ Hospital, Faisalabad, the subject selection criteria being medical practitioners licensed under PMDC, Pakistan. The sample size was chosen to approximate the sample size used in two similar studies referenced as 8 and 10.** After getting ethical approval, a pre-tested validated questionnaire was used for data collection in May 2019. Results were analyzed using SPSS-25.

### **Results:**

141 (94%) doctors agreed that practical curriculum needs revision. 96 (64%) doctors believed that current practical curriculum is not in pace with recent medical advances. 135 (90%) doctors agreed that interpretation of tests like Hb level, ESR is more crucial than their performance. 121 (80.7%) doctors believed that practical hours can be best utilized in learning clinical skills. 141 (94%) doctors believed that 3D models should be preferred rather giving more time to dissection. 116 (77.3%) doctors believed that pharmacy practicals are outdated. 92 (61.4%) participants agreed that amphibian dissection is non-essential for doctors. 144 (96%) doctors agreed that interpretation of biochemistry practicals like AST/ALT is more crucial than their performance.

### **Conclusion:**

The study claims that there is an indispensable need to revise the practical curriculum which is lagging behind the recent advancements. These lab hours should be better utilized in learning clinical skills.

### **Keywords:**

## Medical curriculum, practicals revision, basic sciences

### **Introduction:**

The curriculum of undergraduate medical students encompasses a number of basic science subjects as well as their allied practical procedures that are required to be conducted by the students in order to succeed in their annual examinations. The knowledge of all practical procedures is assessed and evaluated at the end of the academic year.

Western undergraduate medical teaching developed as a university based apprenticeship model that remained unchanged for decades.<sup>[1]</sup> Flexner introduced an academic division within the curriculum with the concept of a separate pre-clinical sciences curriculum preceding clinical teaching.<sup>[1]</sup> Secondly, Osler proposed the long-serving apprenticeship model with the concept of bedside teaching led by the senior clinicians, where trainees and residents learned by direct observation of the 'expert'.<sup>[1]</sup>

Later on, the way of education started changing from discipline towards Problem Based Learning (PBL) and Integrated System of education. It was purposed that, for PBL to be successful not only in its educational objectives, but also in gaining acceptance by clinical teachers, it must be integrated into clinical care as well and involve not only the classroom sessions, but the implementation of learning in the ward and surgery too, including procedural skill learning. One innovative example of integrating learning into clinical practice may be to gain the knowledge within a protected clinical environment such as a teaching ward.<sup>[1]</sup> The integration of

learning into clinical situations reinforces the retention of knowledge in a better way.<sup>[1]</sup>

Medical curriculum is being revised all over the world to ameliorate effective learning and better understanding of the medical undergraduates regarding health and disease states. Many medical schools in USA are now instigating revised curriculum which acquaints the students with integrated medical curriculum, case based learning and basic clinical skills in the early years of medical education.<sup>[2]</sup> Moreover, a number of institutions like Senior Secondary Schools (SSS) Ilorin, Nigeria, and University of Cambridge are employing alternative approaches to teach practicals in a more time effective manner.<sup>[3][4]</sup> A number of previous studies conducted on a group of medical undergraduates in India have divulged that basic medical subjects like Physiology<sup>[5]</sup>, Pharmacology<sup>[5][6]</sup>, and Biochemistry<sup>[6][7]</sup> include practicals that don't benefit the Medical Practitioner in his clinical life as a doctor. A number of these practicals involve skills and lab tests that a doctor never actually requires to perform later in life and relies on laboratories to perform and prepare a report on. Most of these practicals are not up to the mark of recent medical advances and are based on old methods and techniques that are now becoming obsolete. In fact, a significant amount of valuable time that could otherwise be utilized in learning other important clinical skills such as CPR and basic first aid, is lost during the course of preparing practical notebooks and conducting experiments, which cause cognitive overload and unnecessary stress to the students. That's why stress among medical students is increasing at an alarming rate. In this advanced era, where technology is overtaking every field including medical field, the demands for the clinical practice have been changed. In Pakistan, there hasn't been given much attention towards this issue till now. This study aims to evaluate the necessity of these practical procedures and to explore,

quantitatively, what percentage of doctors believe that the inclusion of these basic practicals in their curriculum has benefited them during their clinical practice. It is conducted in a public sector institute which is affiliated with the University of Health Sciences (UHS), a big university in Punjab which has the largest number of medical and dental colleges affiliated with it.

**This study retrospectively investigated if the practical lab classes of basic sciences taken by the medical undergraduates during the course of their studies have a significant positive correlation with their clinical knowledge and practice. The majority of doctors believed that the practical curriculum is outdated, and needs revision. They were also of the view that practical classes consume more time than required and this time can be better utilized in learning and practicing in the clinical setting. Moreover, a majority believed that most of these practicals are more concerned with lab technicians than with medical students and the interpretation of these practicals is more concerned with medical students than their performance.**

### **Materials and Methods:**

After getting ethical permission, a cross sectional survey was conducted with 150 participants including House officers (HOs), Post-graduate residents (PGs), Senior Registrars (SRs), General Practitioners (GPs) and Consultants, selected by using non-probability convenient sampling. A proper consent was taken from the participants and a pretested validated questionnaire was used to collect the data in both online as well as in written form. It was carried out in Faisalabad in May of 2019. Data was analyzed using IBM SPSS version 23.

### **Results:**

All the doctors participated in this feedback and all were well introduced with the academic system of the medical educational institutions in Punjab. 150 forms were analyzed to tabulate the results. 141 (94%) doctors agreed that the practical curriculum needs revision. 96 (64%) doctors believe that the current practical curriculum is not in pace with recent medical advances.

Another significant and interesting finding linked the years of clinical practice to the views about revising the practical curriculum. A higher percentage of doctors with more years of clinical practice believed that practical classes need revision as compared to doctors with less clinical years.

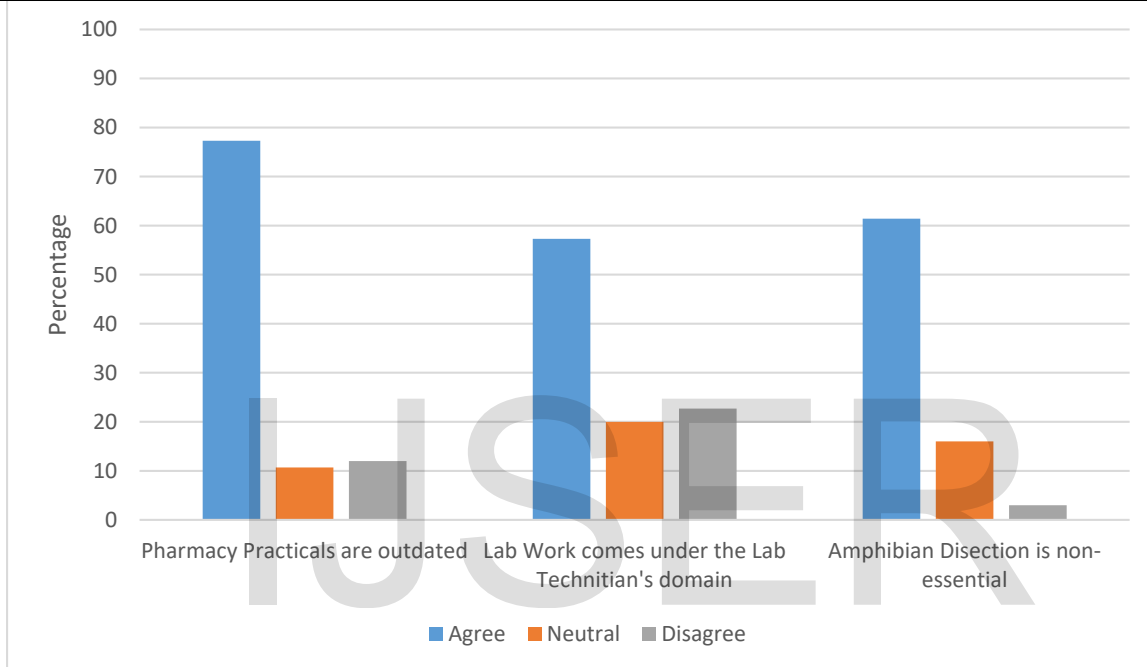
86 (57.3%) doctors believed that laboratory work comes under a lab technician's domain. In addition, 66 (44%) doctors believed that learning and performing procedures consume more valuable time than required. 63 (42%) doctors said that average 11 hours per week is not justified for practicals. 121 (80.7%) doctors believed that these practical hours are best utilized in learning clinical skills. 141 (94%) doctors believed that 3D anatomical models should be preferred while teaching anatomy. 116 (77.3%) doctors believed that pharmacy practicals are outdated. 92 (61.4%) participants agreed that amphibian dissection is non-essential for doctors.

96 (64%) of participants believed that performing tests like Hb level, ESR, CT, BT, PCV are clinically beneficial but 135 (90%) agreed that their interpretation is more crucial than their performance. 76 (50.7%) doctors believed that measuring AST/ALT, Urine glucose levels in Biochemistry is helpful in clinical practice while 144 (96%) doctors agreed that their interpretation is more crucial than their performance.

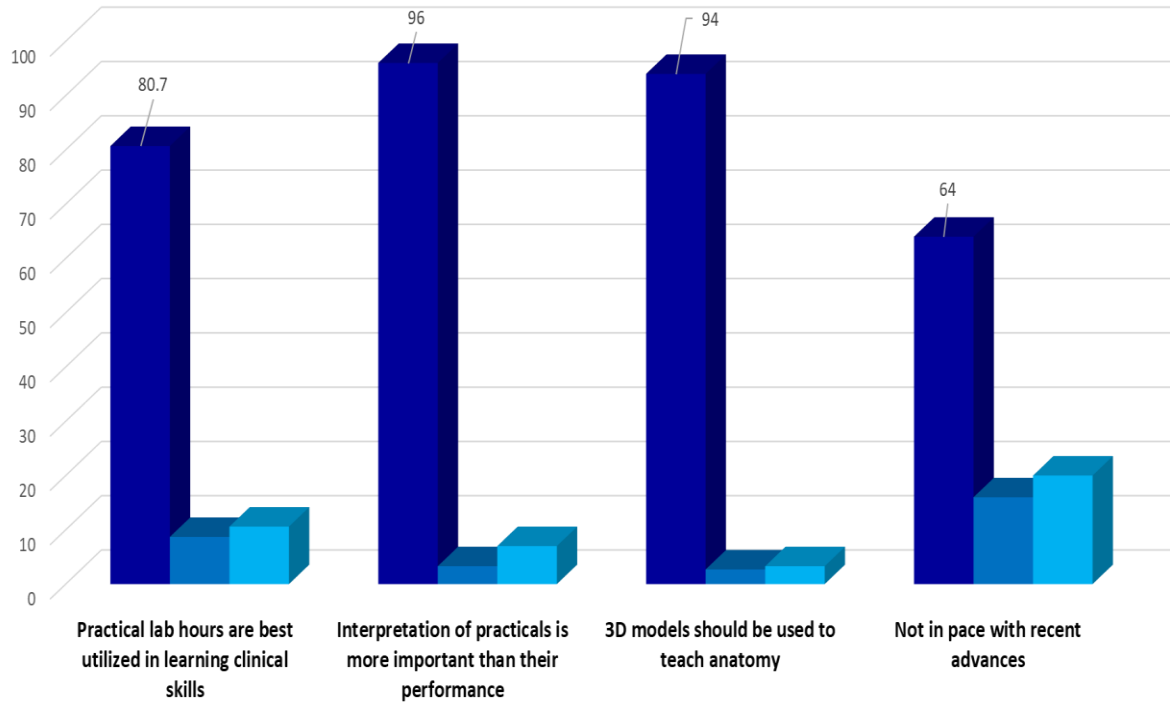
Sr. No	Rank	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Consultants	10 (37%)	16 (59.2%)	1 (3.7%)	0 (0%)	0 (0%)

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2.	GP	10 (58.8%)	7 (41.1%)	0 (0%)	0 (0%)	0 (0%)
3.	SR	5 (55.5%)	4 (44.4%)	0 (0%)	0 (0%)	0 (0%)
4.	PGR	31 (58.4%)	21 (39.6%)	1 (1.8%)	0 (0%)	0 (0%)
5.	HO	19 (43.1%)	18 (40.9%)	5 (11.3%)	2 (4.5%)	0 (0%)







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## **Discussion:**

Most of these practicals are not up to the mark of recent clinical advances and are based on old methods and techniques that are now becoming obsolete. In fact, a significant amount of valuable time that could otherwise be utilized in learning clinical skills is lost during the course of preparing practical notebooks and conducting experiments.

A research conducted in India stated that performance of practicals like eosinophil count, reticulocyte count, platelet count, Arneht count, erythrocyte sedimentation rate and packed cell volume are nonessential for a medical student and history taking as well as clinical skills need to be better introduced at the undergraduate level and moreover, their study showed that amphibian practicals were marked irrelevant/not useful by the majority of the students.<sup>[5]</sup> In a similar way, our study also showed that most of the clinicians are of the view that performance of many physiology practicals (like Hb level, ESR, CT, BT, PCV), biochemistry practicals (AST/ALT), pharmacy practicals and amphibian practicals are not essential and only their interpretation is more crucial. This shows that the trends are same in both countries.

An article that was conducted in Pharmacology department showed that during the course of their practical classes, with the exception of prescription writings, the students have found the pharmacology practicals to be irrelevant in their clinical practice. It also stated that with recent advances and innovations, most of the academicians are of the view that these practicals are not in pace with current clinical scenarios.<sup>[8]</sup>

Medical education involves better learning at student level to ensure that future physicians are equipped with efficient skills to cope with changing health needs.

Across the world, innovations are being implemented in medical education and training for efficient patient care. For example, many equipments like the organ baths used in kymography now a days are fully automated unlike the previous ones in which the students had to maintain the temperature manually which used to influence the results. Similarly, advanced perimeters are being used to assess the visual fields and 3D techniques are being used to teach the human anatomy. According to the American Association of Medical Colleges, medical schools in USA are now adapting a revised curriculum which introduces students to an integrated medical curriculum, problem based learning and basic clinical skills in the early years of their medical education.<sup>[2]</sup>

Another study showed that the concept of skills lab teaching where manikins were used to demonstrate and practice skills was beneficial to students as it improved the long term retention of information as compared to those who were not a part of the skills lab training program.<sup>[9]</sup>

Another study conducted in Biochemistry department showed that automated methods should be introduced in practical curriculum of first year MBBS, as level of understanding of the students was more with the automated methods as compared to the manual ones.<sup>[10]</sup>

~~From the journal of MGM Medical College, Vadodra, Gujarat, India (2016). In Department of~~

In Pakistan, much attention has not been paid towards this issue up till now and most of the public sector medical colleges are following the same old methodology to teach practicals. Also the practical labs and lab instruments in medical institutes haven't been upgraded to meet the latest criteria of teaching laboratories.

Clinical exposure should start in the early years of undergraduate studies, to make the students learn better clinical and communication skills for an efficient professionalism. Case based studies should be encouraged in clinical rotations and

this can be integrated simultaneously with the basic sciences and the laboratory sciences.

The limitations of this study are that it was an observational descriptive study, the sample size which was 150 and consisted exclusively of government sector hospitals in Faisalabad.

**Conclusion:**

The study claims that there is an indispensable need to revise the practical curriculum as the curriculum is lagging behind the recent advancements. Majority of the clinicians were of the view that practicals haven't benefited them much in their clinical practice. Most of these practicals come under lab technician's domain. Practical classes consume more time than required and these lab hours should be better utilized in learning clinical skills.

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