Workplace Based Learning (WBL): An Effective Learning Modality during Orthopaedics Surgical Clerkship: Students' Perspective

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ABSTRACT

Objective: To evaluate the student's perspective about educational and training efficacy of workplace based learning (WBL) during surgical clerkship in Orthopaedics amongst 4th and 5th year medical students.

Study Design: Cross-sectional study.

Place and Duration of the Study: Department of General Surgery, Shifa Tameer-e-Millat University, Islamabad, from September 2020 to December 2021.

Methodology: The inclusion criteria was fourth and final year MBBS students who had completed their orthopaedic surgery mini-clerkship. The exclusion criteria was medical students who did not attend the orthopaedics clerkship in the study period. The research instrument was a questionnaire based on the principles of experiential based learning. The participants were sent an online questionnaire as well as a consent form through e-mail. The responses were recorded and analysed for descriptive statistics.

Results: From the target group, 140 responses were received, 94 students (67%) expressed that workplace environment was conducive to learning and 98 (70%) agreed that their diagnostic and management skills further developed following exposure to the orthopaedic workplace. A short duration of 2 weeks served as a hindrance with 53 (38%) of students expressing that they were not able to effectively inculcate all concepts within that limited time-frame. Moreover, 52 (37.5%) students described limited patient's clerking time.

Conclusion: Though majority of students were satisfied with teaching and learning strategies, design and implementation of the curriculum at the orthopaedics department; yet, there were significant limitations requiring further evaluation and cooperation by both students and faculty in order to establish ecosystem focusing on experiential learning.

Key Words: *Orthopaedics, Workplace based learning (WBL), Student, Clerkship, Learning environment.*

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INTRODUCTION

The time allocated for orthopaedics in the undergraduate (MBBS) curriculum is limited and must be judiciously utilised through interactive, workplace based learning (WBL) aiming at development of essential competencies.[1] In medical education where effective and diligent learning strategies are of utmost importance in the creation of an organised healthcare system, this WBL modality is contributing a sizeable amount of importance.[2] It is more central than ever to incorporate a cooperative framework of workplace environment so as to develop essential competencies.

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Important factors contributing in inculcating essential competencies are cultural climate of environment and how it affects the behaviour of learners; organisation structure of workplace and how it is established to facilitate unhindered interaction; role of facilitators in providing a patient and student-centred approach; and interpersonal relationships between the students and staff; activities followed by timely given reflection and feedback which can serve as an effective learning tool to eliminate weaknesses.[3]

Halsted's model of "see one, do one, teach one" is applied as the focal point behind surgical training and actively used in the field of orthopaedics.[4] Orthopaedic medicine relies very heavily on skill acquiring approach, due diligence from training staff in providing access to appropriate equipment, frequent patient interaction and students approaching with an inquisitive stance in order to facilitate participation and engagement strengthening the learning process along with simulation training.[5] In orthopaedics clerkship, students went through real-life practical experience; reflecting a true archetype of WBL. The local and international literature is highly deficient in

the modality of WBL. Hence, it became necessary to enquire about students' perceptions about their experience of WBL in an undergraduate MBBS clinical programme of orthopaedic. The study rationale was to identify students' perceptions about their experience of WBL, and the aim was to define the importance of an organised and facilitative workplace based learning ecosystem at orthopaedic department.

METHODOLOGY

This cross-sectional study was conducted during 4th and 5th year of MBBS students' rotation in orthopaedic department of Shifa Tameer-e-Millat University, Islamabad, from September 2020 to December 2021. The study was approved by the Institutional Review Board (IRB) before commencement of the study. The participants were selected from the enrolled students during the study period, who expressed their willingness to participate in the study. A purposive sampling technique was applied after taking the college roll of the selective group of students. The inclusion criteria for respondents were 4th and 5th year MBBS students who had completed their orthopaedic surgery rotation during general surgery clerkship. The medical students who had not yet rotated in the orthopaedic department were excluded. The 4th and 5th year MBBS students typically learn clinicals by 8-9 weeks clerkships in almost all clinical disciplines. During the 8 weeks of general surgery clerkship of 4th year MBBS, 2 weeks were dedicated for orthopaedics clerkship. During this period, the students followed the orthopaedics consultants in outpatient and inpatient departments, operating rooms, and emergency room. They observed how patients are being managed, assisted common orthopaedics procedures, attended calls with residents and had hands-on experience. They also attended a one-day workshop of orthopaedic dedicatedly arranged for undergraduate medical students: where they could apply plaster casts, back slabs, and rehearse trauma management. Participants were free to leave the study at any stage. The research questionnaire based on the principles of experiential learning was designed and pretested on a small pilot population like actual respondents, before distribution among the participants. The questionnaires were then sent electronically along with consent forms to the participants. The main themes described were opportunities for patient interaction, adequate patient traffic in the outpatient department, competency and professionalism shown by the teaching faculty and clarity in learning objectives, adequacy of 2 weeks orthopaedic rotation duration, students' experiences about completion of assigned learning objectives, conducive learning environment, students' satisfaction about their learning, and interest of students regarding pursuing orthopaedics and rheumatology as the future career after this experiencing of WBL.

Responses were recorded on 5 point Likert scale, and analysed using the statistical package for the social sciences (SPSS version 23). Frequency and percentages were calculated. The sample size was calculated using Raosoft with a confidence level of 95% and margin of error of 5%.

RESULTS

The total number of respondents was 140 comprising of both 4th and 5th year MBBS students who had been rotated through surgery and orthopaedic department. Response rate was 82%. There were 77 (54.7%) males and 63 (45.3%) females. Table I represents various responses of students about adequacy of 2 weeks orthopaedic rotation duration and students' experiences about completion of assigned learning objectives, conducive learning environment, students' satisfaction about their learning and interest of students regarding pursuit of orthopaedic and rheumatology as the future career, students' responses regarding improvement in their motivation, legitimacy, professionalism, diagnostic, management skills, and whether clinical rotation helped them in understanding the concept of WBL. Ninety-five (68%) students agreed that they were given an adequate introductory class for the orthopaedic rotation and were able to learn the specific vocabulary, rules and regulations of the operating room. Forty-one (29%) disagreed to this view and only 4 (3%) strongly disagreed. Eighty-six (61.5%) students expressed an improvement in their team-building skills while 52 (37%) respondents disagreed and 2 (1.5%) strongly disagreed to this view. Forty-three (30.7%) students showed dissatistaction with the teacher's lack of punctuality and 35 (25%) responded that the faculty was unable to answer their queries in a timely manner.

Table I: Responses of medical students on workplace based learning in orthopaedic department (n=140).

Questions	Responses (number and percentages)				
	Agree	Strongly agree	Neutral	Disagree	Strongly disagree
My motivation, legitimacy and professionalism increased.	71(50.7%)	18(12.8%)	3(2.1%)	44(31.4%)	4(2.8%)
My diagnostic and management skills improved.	77(55%)	17(12.1%)	5(3.5%)	37(26.4%)	4(2.8%)
This orthopaedic rotation helped me to understand basics of workplace based learning model.	80(57.1%)	17(12.1%)	3(2.1%)	39(27.8%)	1(0.71%)
Time duration of 2 week of clerkship was optimum.	72(51.4%)	13(9.2%)	1(0.71%)	47(33.5%)	7(5%)
Orthopaedic department environment was conducive to learning.	74(52.8%)	19(13.5%)	1(0.71%)	43(30.7%)	3(2.1%)
Almost all information taught to me was new knowledge.	73(52.1%)	22(15.7%)	3(2.1%)	40(28.5%)	2(1.4%)
I was able to complete all learning objectives.	58(41.4%)	13(9.2%)	3(2.1%)	61(43.5%)	5(3.5%)
I am satisfied with my own learning and performance.	71(50.7%)	11(7.8%)	4(2.8%)	51(36.4%)	3(2.1%)
I am interested in further pursuing career in orthopaedic and rheumatology after attending orthopaedic rotation.	60(42.8%)	12(8.5%)	3(2.1%)	51(36.4%)	14(10%)

DISCUSSION

Teaching and learning process is regularly evaluated, remodelled and improved. Student's feedback and perspective is vital for academic adjustment.[5] During clinical clerkship in surgery, students rotate in different departments shadowing and following the facilitator throughout implementation of clerkships. With a plethora of tools, devices and resources available, at its core the practice of medicine and surgery is best learned through an apprenticeship in the workplace setting.[6] While the importance of musculoskeletal disease has been acknowledged, the lack of emphasis on orthopaedic teaching has been widely accepted.[7] This study represented the need for the constant improvement of undergraduate medical education ecosystem which should be student-centred.

WBL allows students to learn through steered approach in real-life scenarios. The clerkship model of learning incorporates concept of apprenticeship and WBL, enabling undergraduates to learn clinical skills in a structured manner. Students follow the faculty in clinical departments, emergency room, diagnostics, operating areas, out and inpatient as per clinical and academic schedules. The literature is not rich on student's perceptions regarding these teaching and learning modalities. Therefore, this survey was conducted to investigate students' perception through their feedback on WBL, which will help in better planning, promoting student motivation, ingraining a culture of reflection, self-appraisal, and building self-confidence among students.

The educators' and clinicians' perception had been investigated in several studies who reported many challenges with lot of time-constraints.[8] The educators need to be trained to learn methods of student-centred teaching approach, competency-based assessment skills, professionalism, and ethics to be able to efficiently balance all their roles.[9,10] Many students (30.7%) of this study disagreed about the teacher's punctuality and 25% disagreed that the faculty was able to answer their queries in a timely manner. Hence, based upon this limited data, faculty needs further training while using newer modalities of teaching and learning in clinical situations. The key constituent of good WBL is student's participation, i.e. conscious matching of activities with learning requirements suitable for professional coaching.[11,12] In an ideal situation, this should be combined with 'constructive feedback'.[13] Hence, based upon students' feedback and keeping in mind the needs of modern era, a one-day workshop was designed in orthopaedics clerkship, at the end of 2 weeks clerkship. In this whole day activity, students were given tasks to apply back slabs, pop casts, manage a case of multiple fractures and learn trauma management under supervision. One of the factors for good response rate of student motivation, legitimacy, and professionalism was because of this dedicated hands-on practice (63% agreed and strongly agreed) as shown in Table I.

All students were exposed to an adequate work environment with standardised curriculum devised with patient-centred approach. However, many students expressed that a time constraint of two weeks prevented the ability of students to effectively study the orthopaedic curriculum in-depth while some students were concerned about limited student-patient interface and hands-on experience (Table I). The faculty remained steadfast in their approach to overcome this limitation but the effect on student's experience was indisputable. This study consisted of questionnaire based on the guidelines of experiential based learning and its importance in clinical teaching.[14-16] By integrating this modality of questioning, the results displayed that most of the students were satisfied with the teaching methods employed by the faculty such as adequate patient interaction and a curriculum and environment conducive to learning (Table I). An overall majority felt that their diagnostic, clinical experience, and professionalism improved during clerkship (Table I). However, a few students were unsatisfied about the time duration for acquiring the required competencies. While the majority expressed that they were given enough exposure to patients, orthopaedic rotation helped them to understand the WBL, and it helped in understanding of patient diagnosis and management (Table I).

Among the various challenges of WBL are presence of a physical learning environment, under-resourced teaching units, lack of suitable arrangement for student discussion, and deficiency of trained clinical staff.[17-19] Usually, clinicians involved in workplace teaching have time constraints and limited knowledge of WBL, hence teaching becomes more of didactic lecturing and stress on factual knowledge rather than active student participation. This study's participants had similar responses.[20-22] Timely transmission of learning objectives and required competencies were important factors for effective WBL.[3,23] Clinicians had always been an inspiration for students; in this group of students, the majority agreed that this rotation was motivational for them and some of them even wanted to pursue orthopaedic as the future career (response rate shown in Table I).[1,23,24] One of the reasons for this motivation was that, in a tertiary care centre, a lot of referrals were received regarding orthopaedic, so students got the best opportunity to see a variety of interesting cases being managed.

The biggest strength of this study included delineation of students' perspectives on WBL during orthopaedic clinical clerkship programme in Pakistan and reasonable sample size to compare with literature on the subject for the very first time. This study had limitations that the data were collected from a single institution and the inclusion of outgoing batches in the study may bear recall bias.

The authors recommend that further multi-centric studies should be conducted in order to make and judge WBL process more conducive for students. With the increasing burden of musculoskeletal diseases, it is imperative that future medical students enhance their competency in this field of medicine.[25] It is hoped that this study will serve as a

catalyst for strengthening of the undergraduate orthopaedic education and to straighten the competency based educational process in a given context.

CONCLUSION

Majority of students displayed satisfaction on Likert scale with current workplace based protocols employed in the orthopaedic rotation. Both the facilitators and students must be encouraged to seek opportunities for informal inter-professional learning at workplace.

ETHICAL APPROVAL:
An approval was given by institutional Review Board and Ethics Committee of Shifa international Hospital, Islamabad (IRB # 019-21).

COMPETING INTEREST:
The authors declared no competing interest.

AUTHORS' CONTRIBUTION:
SN: Conception or design of the work, analysis, final approval, agreement to be accountable for all aspects.
FF: Conception or design of the work, analysis, data interpretation, drafting and revising article, accountable agreement, final approval for publication.
RI: Conception or design of the work, analysis, making initial draft, agreement to be accountable for all aspects.
IK: Study conception, making article draft and critical review, agreement to be accountable for all aspects.
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