

Workplace-based Assessment in Postgraduate Medical Education: a 5 year experience from Bhutan

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Abstract

Introduction: Postgraduate Medical Education globally has transited from traditional cognitive heavy learning to more competency oriented learning. Bhutan's only medical university introduced a Competency Based Curriculum (CBC) through the implementation of workplace-based assessment (WPBA) in June 2018. A short-term programmatic evaluation of the trainees' and trainers' perception on implementation of workplace-based assessment for three years at KGUMSB was conducted between July-September 2021.

Methodology: A mixed methods design was utilized such as survey, review of student portfolios and focus group discussions. A total of 62 participants (46 residents in clinical training and 16 faculty members) participated in this evaluation.

Results: After three years of implementation of WPBA, it was perceived as a good system of assessing learners with a high level of acceptability among both the students and faculty members. The practice of providing immediate feedback was well appreciated by students.

Conclusion: The findings support that WPBA is a good assessment system in postgraduate education. However, it was also evident that issues such as perceived time constraints, overburdened students and lack of faculty capacity were possible obstacles to proper implementation of WPBA.

Keywords: Competency-based education; student portfolio; programmatic evaluation; work place-based assessment; postgraduate education.

Introduction

In the last decade or so, workplace-based assessment (WPBA) has been extensively used in postgraduate training in many countries. However, it is currently not widely practiced and established in Asia (Chacko, 2021).

In WPBA, students are assessed in the real work setting followed by feedback, where the assessor utilizes standardized checklists. It conforms to the highest tier of Miller's triangle, whereby trainees are directly observed and assessed in real life situations and in real work settings (Singh & Modi, 2013).

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The Faculty of Postgraduate Medicine (FoPGM), Khesar Gyalpo University of Medical Sciences was established in 2014 to offer various postgraduate programs in the field of medicine. The previous curriculum implemented from 2014 to 2018 was perceived as lacking clarity on the mechanism of proper supervision and mentoring



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of the students as they progressed during their residency program (PGMEC, 2014). In addition, ever evolving health needs mandated a shift to design a curriculum that focuses on building specific competencies (Tenzin et al., 2018). Therefore in 2018, FoPGM initiated the implementation of a competency-based curriculum (CBC) for all postgraduate programs (Tenzin et al., 2018). The competency framework was adopted from the Accreditation of Council for Graduate Medical Education. One of the fundamental changes in the new curriculum was identification of appropriate competencies and the introduction of assessment tools to assess competency in the form of workplace-based assessment (WPBA) tools that focus on outcomes. This was a huge shift from the traditional format of education and assessment.

The basic principle on which WPBA functions is that of direct observation by a supervisor of trainees' performances at the workplace with the provision of appropriate and immediate feedback on their performance based on a standardized checklist (Miller & Archer, 2010; Tenzin et al., 2018). FoPGM adopted four WPBA tools; Mini-Clinical Examination (Mini-Cex), Directly Observed Procedural Skills (DOPS), 360-degree feedback / Multisource Feedback (MSF) and Case Based Discussion (CBD). These tools were deliberately chosen to assess the three main domains of education. These four WPBA tools were thoroughly discussed with expert medical educationists from India, Nepal and Germany. DOPS for assessing procedural skills (psychomotor domain), Mini-CEX for assessing applied knowledge and communication skills (cognitive domain), CBD for assessing the higher order and critical thinking (cognitive domain), and MSF for assessing professionalism and team work (attitude domain) (Miller & Archer, 2010). In conjunction, WPBA tools were designed to foster reflective practice and identify a trainee's strengths and weaknesses, which will enable the supervisor to provide necessary support (FoPGM, 2018).

These assessments are appraised or evaluated through a biannual review of trainees' portfolios;

FoPGM, 2018]. This was a paradigm shift from traditional practice, wherein performance assessments were written or oral examinations as shown in Table 1 below.

The WPBA was implemented in 12 postgraduate programs (Anesthesiology, Otolaryngology, Emergency medicine, General Practice, Internal Medicine, Pediatrics, OBGYN, Ophthalmology, Orthopedic Surgery, General Surgery) from July 2018 in Bhutan. As measure for proper implementation and sensitization both faculty members and postgraduate students were trained by initiating series of two-day workshop in workplace-based assessment. Thus far, despite FoPGM's introduction of work-place-based assessment (WPBA) to assess competency, there was no empirical evidence on how trainees and trainers perceived WPBA. Hence, the purpose of this study is to assess trainees' and trainers' perceptions regarding the WPBA in Postgraduate programs.

Methodology

Study Design

The study was mixed method: a cross sectional survey and a review of student portfolios was conducted for the quantitative component. Focus group discussions (FGD) were conducted with both faculty members and students for the qualitative component. The mixed methods approach aimed at capturing the essence of current practice.

Study site and participants

The review was conducted from July - September 2021 at the Khesar Gyalpo University of Medical Sciences of Bhutan and the National Referral Hospital Teaching in Thimphu. All 2nd to 4th year postgraduate students and core faculty members from the teaching hospital who were part the WPBA activities between 2018 July to 2021 June were considered as potential source of information. Amongst them, those who were available during data collection and consented were included in the study.

Table 1: Summary of the assessment system in the postgraduate residency program

	Examinations	Schedule	Components		Total Marks	% Weightage [‡]
			Written	Practical		
Term 1-2	Institute Examination I	End of term 1	Paper I – V (Each paper) 1. MCQ: 50% 2. SAQ = 5 marks * 10	OSPE = 20 stations * 3 mins = 100 marks	600	Exams = 10 % (CA = 5 %)*
	Continuous assessment(CA)		Mini-Cex, DOPS, CBD, 360-degree feedback, log book/portfolio		100	
Term 3-4	Continuous assessment(CA)		Mini-Cex, DOPS, CBD, OSLE, 360-degree feedback, log book		100	Exams = 20 % (CA = 5 %)*
	Institute Examination II	End of term 4	Paper I & II (Each paper) 1. MCQs: 50 marks 2. SAQ = 5 marks * 6 3. SLEQ = 10 marks *2	1. OSCE, 10 stations (5 mins each) 100 marks 2. short case (2): 50 marks * 2 3. Long case (1): 100 marks (OSLER)	400	
Term 5-6	Continuous assessment(CA)		Mini-Cex, DOPS, CBD, OSLE, 360-degree feedback, log book/portfolio		100	Thesis = 20 % (CA = 5 %)*
	Submission of Thesis	End of term 6	1. Thesis content and Presentation: 25 marks each 2. Oral /viva voce: 50 marks		100	
Term 7-8	Continuous assessment(CA)		Quality improvement project during 7 th term (July-December) with report writing and submission to Dean's office through supervisor for QI project		100	Exams = 30 % (CA = 5 %)*
	Institute Examination III	End of term 8	Paper I & II (Each paper) 1. MCQs: 50 marks 2. SAQ = 5 marks * 6 3. SLEQ = 10 marks *2	1. OSCE, 10 stations (5 mins) 100 marks 2. Short case (2): 50 marks * 2 3. Long case (1): 100 marks (OSLER)	500	
Total Cumulative percentage						100 %

*DOPS – direct observation of Procedure, CBD- case based discussion, MCQ- Multiple choice question, SAQ- short answer question, SLEQ – structured long essay question, OSPE- objective structured Practical examination, OSCE – Objective structured clinical examination, OSLE – Objective structured long examination record.

Data collection methods and tools

Review of student portfolios: Portfolios of all the students of 2nd, 3rd and 4th year postgraduate students (as of July 2021) were reviewed as a measure to understand the context of WPBA, particularly in relation to the terms of reference (TOR) for implementation of WPBA. Criteria such as submission on time, fulfilment of minimum numbers of WPBA and completion of checklists including feedback notes by faculty members and reflective notes by students.

Structured Questionnaire (Survey): Both faculty members and students rated the four WBPA tools in terms of acceptability, feasibility and educational impact. A questionnaire based on 5-point scale (from 1-poor to 5-excellent) was used for rating. The questionnaire was validated by medical education experts from India, Nepal and Germany, in order to get unbiased findings from the survey.

Focus group discussions (FGD): In order to understand and capture the perceptions of both faculty members and students, separate focus group discussions were conducted. One FGD each was conducted with 11 course coordinators

and another with 14 students who were randomly selected based on their availability from the 2nd, 3rd and 4th year batches. The course coordinators were selected as they were well versed with all the academics in the respective Departments.

Data entry and analysis

Data were double-entered in EpiData Entry (version 3.1, EpiData Association, Odense, Denmark), and validated. The frequency and percentages were used to present the descriptive data and for the qualitative data, theme and subtheme-based descriptions were utilized.

Ethical Considerations

The participants were informed about the review exercise with reassurance that no personal details would be reflected in any official documents. The collected information was accessible only to the PI of this study.

Results

A total of 46 (out of 48 eligible) students, and 16 faculty members (out of 46 faculty eligible) participated in the survey as shown in Figure 1.

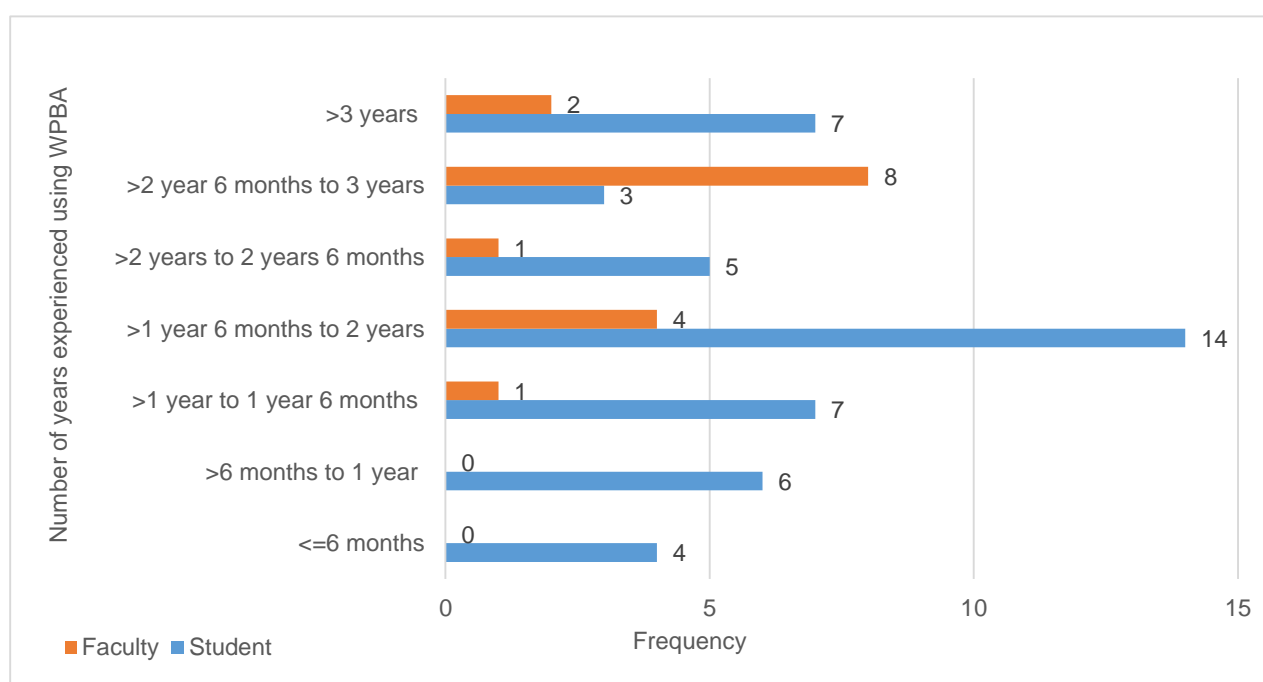


Figure 1: students and faculty members in relation to experience with WPBA.

A. Quantitative component

Review of portfolios: in accordance with the terms of reference for WPBA, a student is required to complete a minimum of 9 encounters at a satisfactory level for independent practice (3 each of DOPS, Mini CEX and CBD along with a minimum of 5 MSF for every semester). However, many students carried out more than the minimum requirement. In addition, all faculty and students completed the feedback note and reflective notes for every WPBA encounter.

Survey: An online form was developed and utilized to capture perceptions on feasibility, acceptability and educational impact of DOPS, Mini-CEX, CBD and MSF/360-degree feedback.

The form was circulated to both postgraduate students and faculty members.

Feasibility of WPBA as an assessment system

At least 77% of both faculty and students reported all WPBA tools were feasible. DOPS was considered the most feasible by 98.4% and the least feasible was CBD 77% as shown in figure 2. Around 74% of the respondents accepted WPBA as a good assessment tool. The highest rating was for DOPS (92%) and the lowest for MSF (74%) as shown in figure 3. Nearly 71% of the study participants reported that WPBA had a good impact on the learner's education as shown in figure 4.

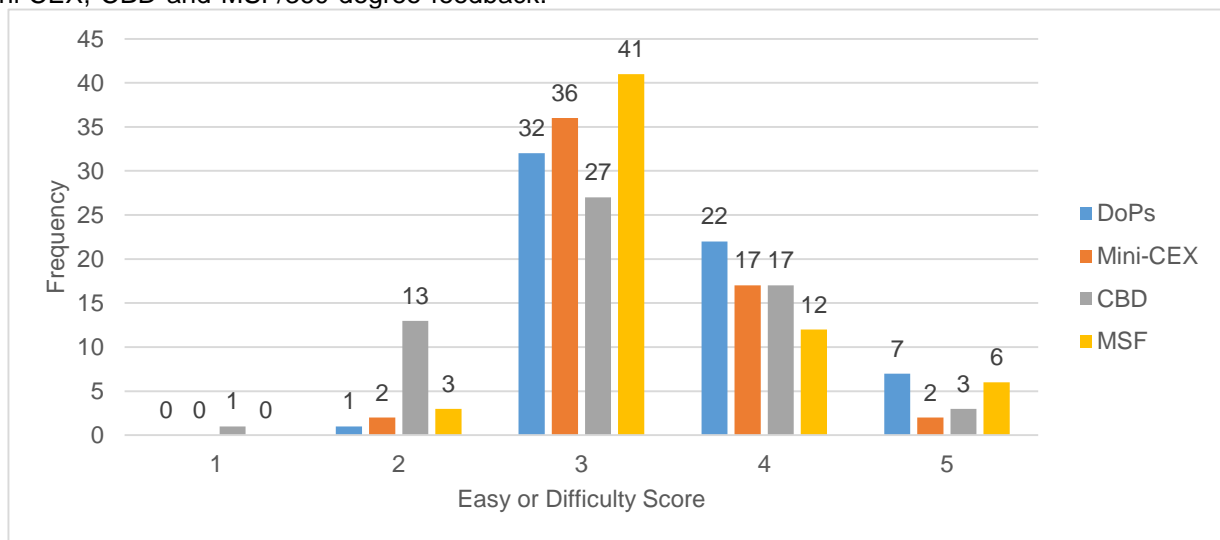


Figure 2: Demonstrating feasibility score for four tools of WPBA at FoPGM

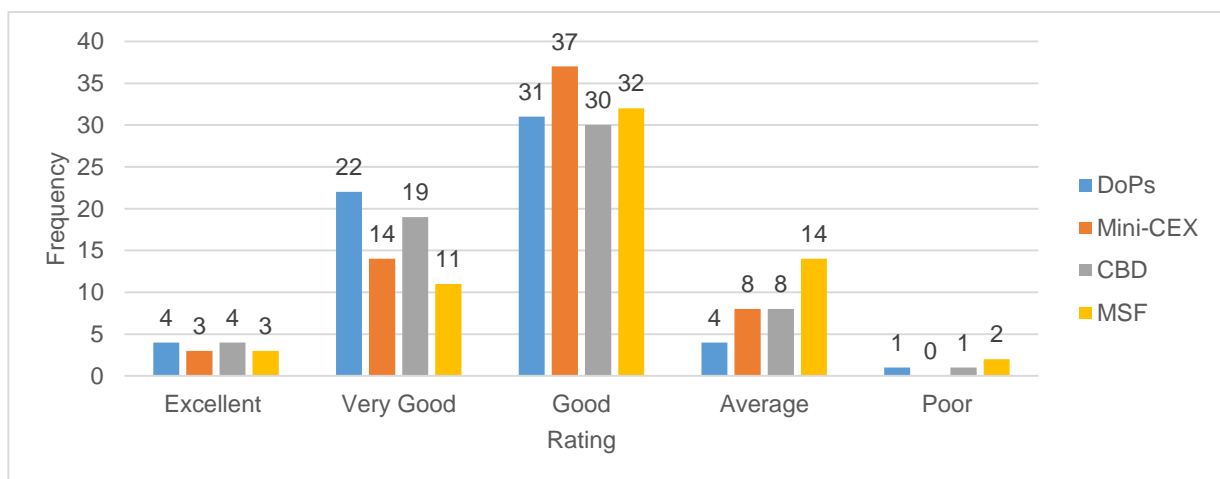


Figure 3: Acceptability scores for the four tools of WPBA at FoPGM.

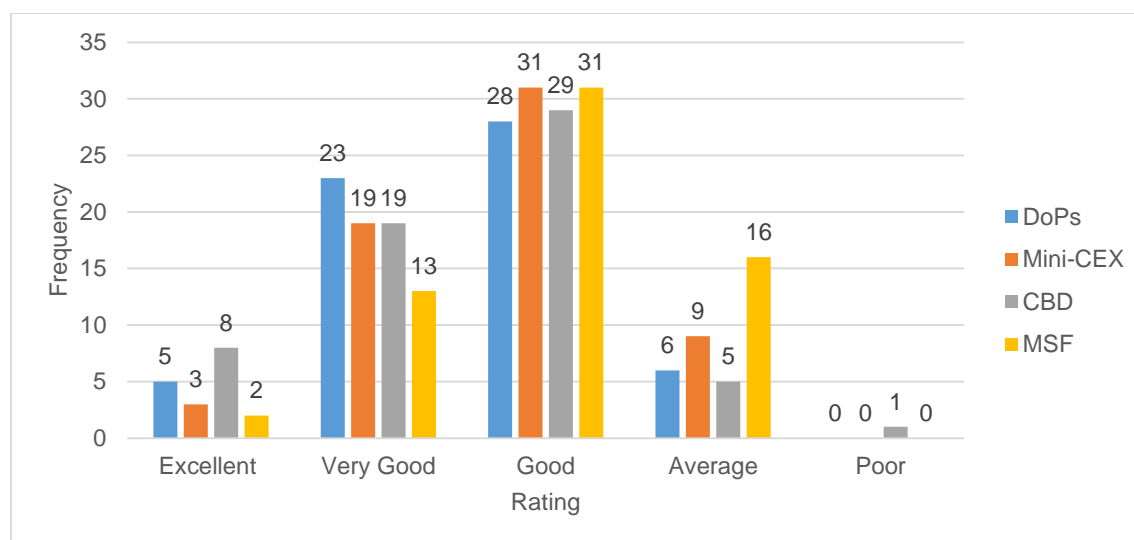


Figure 4: Educational impact scores for the four tools of WPBA at FoPGM

B. Qualitative component

Four overarching themes emerged from the two FGDs with faculty members and students. The themes were;

- i. Factors influencing WPBA implementation,
- ii. Utility of the WPBA tools in learning and assessment;
- iii. Feasibility of WPBA in Postgraduate education and
- iv. System enhancement in relation to WPBA.

Theme 1: Factors influencing WPBA implementation

The notable factors were categorized as student related, faculty related and the department's environmental related factors.

The students reported that since WPBA had weight in their continuous assessment in terms of marks, that encouraged them to take WPBA more seriously. The faculty members reported that since they were responsible for many tasks, it was difficult for them to dedicate time to the resident for WPBA unless the students themselves proactively came forward. Some departments perceived the WPBA as just a

document, and that the traditional system was better.

Resident K - "Some of our faculty say that - WPBA is for the University, for us Traditional system is the main stay".

Faculty U - "I find CBD bit more difficult compared to other tools. This is mainly due to the fact that it feels like a duplication to case presentation"

Theme 2: Utility of the WPBA tools in learning and assessment

The postgraduate students agreed that repeated WPBA encounters assisted them to gain more confidence and communicate with patients in a much more efficient manner. The Faculty members also agreed that they understood their students better and were able to interact well.

Resident S - "I have become more confident, systematic and orderly in my approach to patients"

Resident S - "DOPS is extremely useful, as in Emergency, lots of procedure carried during daily work"

Theme 3: Feasibility of WPBA in Postgraduate education

The theme generated differing perspectives from the faculty members and students.

Faculty S – *“Many a times, I can’t teach them due to many factors. WPBA assessment good for me in understanding the level of insight of my learners”*

Faculty P – *“3/5 as rating, we must revisit our intention. However, we must enforce more seriousness from the learner side”.*

Resident S – *“WPBA is good as it is conducted with use of standard checklist”*

Resident T – *“MSF is filled haphazardly and often for the sake of filling it up. This defeats the purpose”.*

Theme 4: System enhancement in relation to WPBA

Discussion regarding this theme revealed that there is requirement for capacity development, enhanced monitoring and evaluation, and strict compliance to the ToR of WPBA for robust implementation of the assessments.

Faculty K – *“In the existing practice there is no better option than WPBA, so we must reinforce the proper implementation of WPBA in PG”*

Faculty P – *“Many faculty members are still lacking capacity to conduct WPBA in proper manner. University must provide training”.*

Faculty K - *“In my Department we are 10-12 of us, WPBA to each of us means different. At times, we disagree in front of our learners”.*

Discussion

The review of three years of implementation of WPBA in the postgraduate residency program at KGUSMB generated interesting findings which

are extremely encouraging. Both faculty and students agreed that WPBA was a feasible and objective system of assessing a learner. The review also brought to the table the need for optimizing the efforts to institutionalize the WPBA, motivate both faculty and learners through more realistic and strategic actions (Wangchuk *et al.*, 2020; Wisniewski, Zierer & Hattie, 2020).

Feasibility, acceptability and educational impact of WPBA

Over 70% of both faculty members and students agreed that WPBA was feasible in the postgraduate residency program at KGUSMB. This is similar to the findings from other studies in the region and internationally (Norcini & Burch, 2007; Pereira & Dean, 2009; Augustine *et al.*, 2010).

Further, both faculty members and students reported that existing WPBA tools were effective for both learning and assessment in postgraduate programs which are predominantly skills based. This is driven by the concept that WPBA entails direct observation of a performance at the workplace, followed by immediate and contextual feedback (Morris, Hewitt & Roberts, 2006; Norcini & Burch, 2007; Nair *et al.*, 2008; Pelgrim *et al.*, 2011; Tan *et al.*, 2015; Tenzin *et al.*, 2018; Wisniewski, Zierer & Hattie, 2020).

Resident SR *“Helps prepare for exams; a systematic way of presentation and answering question”*

A resident reported the DOPS in particular facilitated in clinical skills development.

Resident DR *“DOPS has improved my confidence while performing procedures on patients”.*

This is similar to a study in which 70% of the participants reported that DOPS helped improve their clinical skills and a further 65% were of the opinion that undertaking DOPS would improve their future career (Pelgrim *et al.*, 2011). A study

from Bhutan on DOPS in pap smear and intrauterine device insertion reported that DOPS was effective in facilitating students' learning. Some of the students believed that repeated exposure to DOPS reduced their level of stress (Tenzin et al., 2019).

Feedback

Resident ST *"WPBA involved lots of feedback; Immediate feedback is extremely enriching"*.

Both the faculty members and the students confirmed that the principal difference between WPBA and the traditional assessment system, was provision of "immediate feedback" with use of a standard checklist (Al-Kadri, Al-Kadi and Van Der Vleuten, 2013; Tenzin et al., 2019; Wangchuk et al., 2020).

Challenges and difficulties associated with WPBA

i. Time constraints and administrative burden: Both faculty members and students shared that WPBA serves as the most authentic source of effective feedback during training. The feedback received serves as a navigation tool towards achieving the intended learning outcomes and enhances clinical competencies in the long run (Tenzin et al, 2019; Al-Kadri et al, 2013; Dargay et al 2020).

However, the process of filling the WPBA checklist forms, scheduling time with the assessor and multitasking were labelled as bureaucratic and time-consuming. It was also noted that collation of results posed a significant burden for both faculty members and students (Tenzin et al., 2019). Time factor and organizational difficulties were cited most frequently as downside of WPBA (Morris, Hewitt and Roberts, 2006; Tenzin et al., 2019; Wangchuk et al., 2020; Dargay, Tenzin and Tenzin, 2022).

Resident SG *"Timing is an issue. Formal scheduling will helpful in making it more feasible"*.

Resident NR *"Preparing hard copy portfolio consumed more time; e-portfolio will make it more feasible"*.

ii. Faculty capacity: A faculty member reported:

"In my Department there are 10-12 of us, WPBA to each of us means different. At times, we disagree in front of our learners".

Similarly, another faculty stated:

"While undertaking CBD, I am not sure what kind of feedback is to be provided because the as learner becomes aware of his or her shortcoming during the discussion period itself".

Thus, capacity development would be essential to implement standardized WPBA practice. Similarly, students also agreed that some faculty members did not practice standard WPBA (Sabey & Harris, 2011; Singh & Modi, 2013; Tenzin et al., 2018; Wangchuk et al., 2020).

Strengths and Limitations of the study

This is the first evaluation following 3 years of implementation of WPBA in the postgraduate program with use of a convergent type of mixed method design. Over 95% of students who participated in the study had experience with WPBA.

However, only 35% of faculty members could be involved as most faculty members were out of station for temporary duty. Therefore, faculty perspectives may not be representative.

Conclusion

After three years of implementation of WPBA, it was perceived as a good system for assessing learners with a high level of acceptability among both the students and faculty members. The practice of providing immediate feedback was well appreciated by students. These findings support that WPBA is good assessment system in postgraduate education.

However, it was also evident that issues such as perceived time constraints, multitasking students and lack of faculty capacity were possible obstacles to proper implementation of WPBA.

Recommendations

The focus group discussions generated useful recommendations. Firstly, the need to explore on converting the current the hard copy portfolio into an e-portfolio would facilitate effective use of their time and improve the documentation of WPBA encounters. Secondly, a high proportion of faculty members appreciated the WPBA system. However, there was a need to build capacity of the faculty members related to WPBA to enhance implementation. Thirdly, there is a need to establish a robust monitoring and evaluation system to ensure systematic implementation of WPBA.

Ethical approval and consent to participate:

Ethics review was exempted by the Research Ethics Board of Health, Ministry of Health, Bhutan given the non-biomedical nature of the study (Ref. No. REBH/ PO/2021/078, 8th June 2021). The study was conducted after obtaining permission from the Faculty of Postgraduate Medicine and informed consent was taken prior to the FGD for voice recording. Only anonymized data is presented in and all identifiers related to the quotations are removed.

The research has been conducted as per the research ethics board policies related to the involvement of humans in the research.

Consent for publication: Not applicable.

Availability of data and materials: The datasets generated and/or analyzed during the current study are available from the corresponding author upon request.

Competing interest: The authors declare that they have no competing interests.

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Author Contribution: All authors were involved in critically reviewing the paper. All authors read and approved the final manuscript.

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