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### Effectiveness of online problem based learning (O-PBL) in undergraduate physiotherapy education

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#### ABSTRACT

Currently, there is limited evidence about the effectiveness of online problem based learning (O-PBL) in undergraduate physiotherapy education that may help the educators and students in this unusual pandemic situation due to Coronavirus disease (COVID-19) outbreak and lock down situation in India. We describe the utility of O-PBL an online version of problem based learning as a teaching tool to supplement the existing online teaching techniques. After two problems based learning scenarios and discussion we evaluated its effectiveness through the feedback from participating students about what they liked or what they didn't like about O-PBL as a teaching tool. We found that O-PBL offered positive benefits for students, high level of motivation and self directed learning to apply theoretical knowledge frame work to solve clinical problems with effective team work.

**Keywords:** Physiotherapy, Online, Problem based learning, Undergraduate, Effectiveness, and learning.

#### INTRODUCTION

Problem-based learning (PBL) was first introduced in the 1960s by a Canadian medical educator, Howard Barrows. Since that time, problem-based learning has moved into mainstream education in most content areas in K-12 and, more reluctantly, into higher education as well. Although problem-based learning has successfully moved from the medical field into other fields of study [1]. Problem based learning has been widely adopted in various educational fields to promote critical thinking and problem-solving in real life learning situations. Its close association with academic and clinical workplace collaboration and interdisciplinary learning contributed to its spread beyond the conventional domain of clinical

education to applied health disciplines including physiotherapy. With this growing practice and recognition of PBL in various educational and organizational settings [2-4]. There is a growing number of studies evaluating its usefulness in terms of the quality of student learning and the amount of its promise to develop self directed learning habits, problem solving skills and deep disciplinary knowledge, achieves its intended result [5-7]. Considerable number of the previous studies on PBL have examined the effects of this approach within the curriculum, with more recent studies delving deeper to examine how the processes within PBL lead to positive learning outcomes [8, 9]. On 11 March 2020, WHO Director General characterized COVID-19 as a pandemic and on 24

March, 2020, Prime Minister Narendra Modi ordered a nationwide lock down to limit the movement of 1.3 billion population of India as a preventive measure against corona virus pandemic in India [10]. Amid the nation-wide lockdown, the University Grants Commission (UGC) encouraged online teaching to complete the prescribed syllabus. However, physiotherapy undergraduate students and teachers were apprehensive about practical teaching during this period and hence to supplement this area of teaching learning we thought of using online version of problem based learning in orthopedic physiotherapy subject. Hence, the objective of this case study was to find out the effectiveness of Online Problem Based Learning (O- PBL) in undergraduate physiotherapy education in respect of IV BPT students in orthopedic physiotherapy subject.

## METHODOLOGY

O-PBL was performed with IV year BPT students of Nootan College of Physiotherapy, Sankalchand Patel University, Visnagar, Gujarat from 1 April to 17 April 2020. PBL scenarios were shared through what's app and email to participants. This was done one week prior to actual discussion. After a week online PBL discussion was conducted with the help zoom app by two supervisors (KS & SK) at suitable time (1.30 PM) with 12 and 9 participants on two separate occasions. PBL scenarios were pertaining to orthopedic physiotherapy subject and depicted shoulder impingement syndrome and hip analysis due to analyzing spondylitis. These clinical problems were chosen since they already had didactic lectures on these two topics prior to lockdown period.

## RESULTS

All the participants reported that they liked this method of teaching as an alternative in present situation due to lockdown as a means of augmenting their clinical knowledge through self-directed learning. We found the responses from participating students about what they liked or what they didn't like about O-PBL as a teaching as follows; Team work: A good team work could be done in order to take up this O-PBL session and 90.47 % felt that this provided one of the better

options to communicate and work together and in the past they had hardly used their mobiles for communicated to this extent about academic stuff. Physical comfort: participating students felt that being in home they felt more comfortable as compared to traditional classroom since they could seat the way they want or wear comfortable clothes. Autonomy: Unlike traditional online classes, 80.95% felt little more freedom to participate in this activity since it was more of self directed learning and they had freedom to identify the issues and come back with solutions. Although they realized that they had spent many hours in preparation for these O-PBL sessions. Better option: Majority of students (95.23%) who participated in these two O-PBL sessions almost all of them 95 % reported that compared to online lecture, pod casts or just discussion O-PBL was a better option since they could connect with their prior theoretical foundation and could understand the application for concepts that they learned in the class room in the past. Technical problems: Technical issues were reported by 42.85 % of participants and were about poor quality of audio or audio disturbance. We thought this could have been due to the use of mobile for this purpose, unstable internet. It was noted that quality of sound was better when participants used un mute option only when they wanted to speak and participate in discussion and to augment this typed chat/message option was used by supervisors was to facilitate the discussion. Mental health issues: Some of the participants 14.28% felt that it is always better to work at college with colleagues than online since you are just with technology and you miss that real life situation of working in group or social benefit and with technology you feel like lonely or isolated. Disturbance: Disturbance by family members during O-PBL session was reported by 19.04 % and felt that it was out of curiosity, whether still online session is going on, how long it will take or their concern about whether the participant required any sort of assistance like getting food or beverages.

## DISCUSSION

Endorsement of online technologies in health professionals' education, including physiotherapy, has been suggested as efficient and well-accepted tools for improving student learning. At this

moment of time, almost all over the world, the online teaching, learning and evaluation has got a momentum due to COVID 19 pandemic. Problem based learning is used in many of health disciplines worldwide to facilitate the acquisition of knowledge attributes like communication skills, teamwork, problem solving, independent responsibility for learning, sharing information, and respect for others[11, 12]. We thought of using O-PBL as tool to supplement applied clinical learning amongst IV BPT students and their perception about this activity and thereby facilitate study from home or inculcate a new habit or simply offer a change in teaching tool. Duch et al reported that Problem-Based Learning (PBL) is a teaching method in which complex real-world problems are used as the vehicle to promote student learning of concepts and philosophy that is contrary to straight presentation of essential concepts. Besides academic course content, PBL can facilitate an increase in critical thinking skills, problem-solving abilities, and communication skills [13]. It can also provide opportunities for working in groups, finding and evaluating research materials, and life-long learning [14, 15].

We felt that this study is just an initial pilot study like effort and more research into O-PBL is

required to get a big picture of this creative need based modification since we strongly believe that human behavior vary with environment or any other related factors. Further, the strategic direct evaluation of participants was avoided in this study since we felt that performance may alter if the participants are told that they will be evaluated for their participation in this online group activity although it has been reported that problem based learning the conceptualization, design, implementation and usefulness of the PBL program, and to determine its effectiveness with traditional PBL tool may be evaluated with means like Course Experience Questionnaire [CEQ] and Student Course Experience Questionnaire (SCEQ). [16]

## CONCLUSION

Online problem based learning may offer as an alternative to conventional problem based learning approach in situation where traditional discussion at one place may be difficult and we feel that O-PBL may open an area to explore PBL learning with participants from various educational or organizational settings as PBL discussion with resources beyond borders approach.

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