SJIF Impact Factor (2023): 8.574| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 8 | Issue: 9 | September 2023 - Peer Reviewed Journal

EFFICACY OF CASE BASED LEARNING IN UNDERSTANDING PHYSIOLOGY OFERYTHROCYTES

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ABSTRACT

Physiology is the subject taught away from clinical setting. Therefore the students fail to connect the subject taught through didactic lectures to the clinical courses. Case based learning can be used in conjunction with didactic lectures to help the students for better understandingand application of Physiology with clinical correlation.

The aim is to study efficacy of case based learning in understanding of Physiology of erythrocytes. Objective to introduce Case Based Learning which is student centric and facilitates the student to be lifelong learners and enhancing their understanding of physiology.

Physiology of erythrocytes was taught to all the first year Homoeopathic students throughdidactic lectures. The concept of case based learning was introduced to the students. A MCQ test formulated on erythrocyte physiology was taken before introducing the paper based cases to the students. After the students have solved the paper based cases in groups same MCQ test was repeated. The performance of pre and post introduction of case based learning was analyzed. Thestudent's perception was collected on basis of questionnaires.

The graph of pre and post- test shows a significant improvement in understanding of physiology of erythrocytes. It is evident from the analysis of the feedback percentage of the students agreeing to the effectiveness of case based learning of erythrocytes ranges from 57 to 82percent. Case based learning sessions can be judiciously used to enhance the understanding of Physiology and its application in Homoeopathic students.

KEYWORDS: *Case based learning, Physiology, group discussion.*

INTRODUCTION

Physiology is study of functions of the human body which is an important subject in homoeopathic medical education that if deficient in, the student may feel inadequately prepared for understanding of Pathology, Medicine and the clinical sessions during his education as wellin future clinical practice. The subject is vast and along with understanding there is a lot of abstract (conceptual) thinking, thus learning physiology can be enhanced if the subject matter hasimmediate relevance with clinical correlation or simulating with case based learning (CBL). In the conventional chalk and talk (didactic) method of teaching vast information of physiology is transmitted or passed on to the students presuming that they have learnt. In the didactic lecture method the students play a passive role of listening. Most of the students try to study physiology by rote learning which refers to superficial learning with the sole purpose of being able to recall information. Another method of learning widely used by the students is Strategic learning means Studying only the part of the topic questioned in exams with the sole purpose to pass in the exams.

The working method of Case Based Learning is as follows

- Information regarding a clinical condition of the patient and the laboratory findings are provided to a group of students through paper based cases with questionnaires which are meticulously prepared to highlight the topic for conceptual understanding.
- Case Based Learning allows the student to develop a collaborative team based approach and to discuss the issues in small group supervised by the facilitator.
- Learning from a problem is a condition for human existence. The student recognizes the problem, researches the problem, and presents an interpretation of the solution.
- Incorporated in this process is gathering information from pertinent sources (experts in the field, books, journals, and internet.etc.),
- Analyzing the information, developing hypotheses, and then sharing the efforts and thoughts with colleagues and lastly confirming the analysis with the facilitator.

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Case-based learning (CBL) has been proposed as a method of introducing clinically relevant material and encouraging students to conduct independent studies as well as to develop beneficial, life-long learning habits. In contrast to the lecture-listener format of education, CBL is student centered, motivational, self-directed learning as the student being the active participantand the teacher playing the role of facilitator.

CONTEXT OF THE TEXT

Physiology is taught through didactic lectures i.e. imparting great deal of information to the students. Methods in which the students are only listening and have a passive role to play therefore get distracted easily thus lose interest. Physiology would be more interesting to students if we add

- Clinically relevant material in teaching learning methods,
- Promote interaction enhancing active participation between students,
- Teach problem-solving techniques to the students.

Another purpose was to make Physiology more interesting for better understanding with CBL.

MATERIAL AND METHODS

Study Design:CBLintroduced after teaching erythrocytes by chalk and talkmethod and conducting practical's.

Study Setting: 1st BHMS Students In Department Of Physiology.

Sample Size: 100.

Study Duration: 3 Months.

Material Used: Pen, Paper, Physiology and Biochemistry Textbooks, Laptops with NetConnection, Structured bullet/short cases, Feedback form.

SAMPLE SELECTION

- Inclusive criteria: All 1st BHMS eligible students with informed consent. No control group formed due to ethical issues.
- Exclusive criteria: Students not willing to undertake CBL.

METHODOLOGY

- Permission from Principal and Ethical committee approval was taken.
- Students were sensitized and explained about the concept and the steps of CBL and their written consent taken.
- Physiology of Erythrocytes taught in didactic lecture (Morphology of RBC, Erythropoiesis, factors affecting erythropoiesis, Anemia- its definition, classification. Metabolism of iron, Hemoglobin synthesis and degradation) and practical's pertaining to erythrocytes conducted (Hemoglobin estimation, RBC count, PCV/ESR, Blood indices).
- The students were informed about the pre-CBL intervention test and they were asked to comeprepared for the test.
- One hour Pre-CBL introduction MCQ (30 mks-one mark each) test on the topic of Erythrocytes conducted. MCQ were meticulously structured on Erythrocytes and its applied Physiology.
- CBL conducted for 3 days for each batch [A batch -1-38, B batch 39-77, and C batch 78 onwards] and met in two consecutive weeks. Time period - 3 hrs. each day.
- Each group comprising of 6-7 students was formed. So five groups to accommodate 35 students from in each batch A-1 to A-5, B-1 to B-5 and C-1 to C-5.
- The groups were made to sit in circle to maintain eye-to-eye contact to ensure they follow therules of group dynamics. They elected their team leader one scriber, time keeper.
- Team leader ensured active participation from each group member.
- Scriber writes all the probable solutions given by each team member.
- Time keeper ensures completion of the work allotted in given time frame by the facilitator.
- Five paper based cases were distributed to each group. Three bullet cases and two short caseswere given to the groups. The cases formulated were based on the applied physiology of erythrocytes.

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- In the first session students in each group were asked to read the case loudly discuss the case identifying the learning area and analyzing the case to attain appropriate solution to the posedproblem.
- In the next session the case was presented and discussed till all the students in each group were satisfied about the solution of the problem.
- Facilitator floated from group to group inspecting and intervening the group to ensure that they were on the right track and performing according to the standard procedure and within the stipulated time.
- Presentations were taken from each group by the facilitator.
- After successful completion as per the regulation and time frame set by facilitator was followed by one hour Post introduction of CBL Test was conducted.
- Anonymous Feedback regarding the CBL taken from the students.

EVALUATION PLAN

Quantitative: Pre-test and Post- test (MCQ scores) 30 marks each was taken for assessment ofgain of knowledge and comparing the efficacy of CBL to the conventional methods.

Qualitative: Anonymous written Feedback taken from the students at the end of the session through structured questionnaire .The responses were measured in terms of agreed, disagreed or remained neutral.

RESULT

Quantitative: (Annexure-1)

A] Table-1 is the statistical analysis of pre and post CBL test.

Null Hypothesis: There is no significant difference between Pre-test and Post Test scores orthere is no improvement in students' performance after Lecture based training and Practical.

$P < 0.001$ value shows there is highly significant difference Pre and Post test scores. Hence we reject Null hypothesis and conclude that there is highly significant difference between Pre-test and Post test scores.

Table showing the pre and post-test analysis.

B] The graph-1 portrays a definite improvement the understanding of Physiology of Erythrocytes.

Qualitative: - (Annexure-2)

B] Analysis of student's responses collected through feedback questionnaires has a positive Response and the students strongly agree to maximum attributes of questionnaire.

- 69% students strongly agree that CBL improved their understanding of erythrocytes.
- 69% students strongly agree it definitely has useful in understanding of the physiology of erythrocytes.
- 60% feel that it improved their understanding.
- 72% students enjoyed working in groups, 57% agree that CBL encouraged student responsibility.
- 67% students agree that CBL improved problem solving abilities and also agree that CBL can beused along with the lectures.
- 70% of the students feel that other topics should be taught in the similar manner.
- 81% agree CBL should be continued for other batches as it helped in retaining the knowledge of erythrocytes.
- Most of the student (72%) enjoyed group interaction and that it helped in better grasping the topic.

DISCUSSION

CBL was conducted to fulfill the pre- set objectives and it is evident from the results that CBL resulted in considerable improvement in all aspects of learning particularly discussion in group gives the student the chance to monitor their own learning, developed better communication and presentation skills. Also gained self-confidence and provoked internal drive for learning.

CBL distinguishes from didactic lectures giving an opportunity to have one-to-one exchanges with the facilitator and one-to-many exchanges with the peer benefitting focused working and learning experience.

CONCLUSION

From the above discussions Case based learning

- Promotes self-directed learning,

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- Better study environment in group discussions
- Developed the student's analysis
- Problem solving skills.

The analysis of the results as well as feedback supports that CBL is an excellent educational paradigm which drives student centered learning and incorporates practicalapplication of knowledge of basic sciences to become a lifelong learner. The aim of making the subject more interesting and understandable thus connecting the knowledge of erythrocytes for clinical application through paper based clinical cases was achieved. Thus concluding CBL was more beneficial than didactic lectures and the study fulfilled the specific learning objective. CBLshould be included in the curriculum along with the didactic lecture as it covers all the three domains of learning namely.

Learning domains covered were as follows

- Cognitive domain the student is able to learn the topic in depth, understand, retain and apply the knowledge.
- Affective domain Enhanced communication skills like interaction with peer and facilitator, active participation, motivation and sharing.
- Psychomotor domain Case presentation methods and techniques.

Today's medical education system should aim at imbibing new Teaching-Learning methods so as to fulfill the National goal of health by producing efficient healers for society.

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