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Original Article

Perception of Medical Students Regarding Case Based Learning

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Abstract

Background: To determine perception of first year medical students about Case Based Learning (CBL) in a modular curriculum.

Methods: In this cross sectional quantitative study convenient method of sampling was used to collect data from seventy-nine participants on a reliable survey tool (Cronbach alpha reliability=.87). Ethical approval was obtained and consent for the study was taken from study participants. The data was analyzed on SPSS version 22.

Results: The eight questions asked in the survey yielded a statistically significant result with Friedman's chi square=85.84 (df=7) p=.000<0.5, for perception of students in CBL session. We accepted the alternate hypothesis.

Conclusion: Most of the students agree that CBL is useful. It promotes group discussions, interpersonal skills, feedback by students and teachers and helps them to correlate clinical data.

Key Words: Case based learning, Interpersonal skills, Group discussions, Critical thinking.

Introduction

Case based learning (CBL) is a method of learning on a continuum of Problem Based Learning. It is assumed to promote critical thinking and problem solving. The method is traditionally used in clinical years of undergraduate teaching and learning. In a traditional discipline based curriculum, the students learn the subjects of anatomy, physiology and biochemistry in a lecture based teaching and are assumed to apply the knowledge learned in preclinical years to solve patient problems when they enter the clinical years. In a discipline based curriculum students are unable to understand how the different parts of human body function together in normal and diseased state to solve a patient's clinical problem. In contrast, an integrated curriculum allows the student to take a holistic view of patients and their problem. Literature review showed that case based learning in basic science subjects of Anatomy, Physiology and Biochemistry promotes development of clinical competence in preclinical years. CBL promotes vertical and horizontal integration of preclinical with clinical subjects. Case based discussions are primarily used in post graduate clinical training where teacher selects a patient record and explores it with the learner. The teacher evaluates the application of basic, clinical knowledge and decision making on dimensions such as patient presentation, investigations and management options. Application of case based learning exposes the student to clinical thinking and decision making without patient exposure in a safe environment. It provides a venue for students to apply basic science knowledge within clinical context.

Purpose of this study was to determine perception of first year MBBS students to learning in case based learning sessions in the subjects of anatomy, physiology, biochemistry taking into account the independent factors of usefulness of CBL, clinical cases, correlation of clinical cases with learning objectives, group discussions, interpersonal skills, feedback by students, feedback by teachers and overall impression. We hypothesized that there will be a statistically significant difference between the means of six levels of the eight within people (subject) factors (independent variable) and the perception about CBL (dependent variable).

Subjects and Methods

A cross sectional study was conducted to collect data from students regarding case based learning. A convenient method of sampling was used.The study was conducted at Heavy Industries Taxila Education City-Institute of Medical Sciences (HITEC-IMS).The institute follows a modular curriculum approved by NUMS academic council. Each basic science department of first year conducts one CBL in a week. Survey form comprised of eight questions on a Likert scale (Table 1). Each question was rated as 1=Strongly disagree, 2= Disagree, 3= Slightly disagree, 4= slightly

agree, 5= Strongly agree, 6= strongly agree. These six were taken as levels of a within subject factor also called the independent variables. The subjects or participants were the cases exposed to the six independent variables or questions and the same dependent variable i.e., perception bout CBL. Minimum possible score on the scale was eight, maximum was forty-eight. The reliability of the survey tool was determined and was found to be good at 0.87. Completely filled survey forms with consent were received from seventy-nine study participants. A non-parametric test was done by Friedman chi square. Dependent variable perception about CBL was not normally distributed violating the assumption for using repeated measures ANOVA, histograms of all the independent variables or factors which are the eight questions of the survey form also showed that the data was not normally distributed hence non-parametric counterpart of repeated measures ANOVA, Friedman test was carried out.

Results

Maximum mean score 4.38±1.34 (Table 1) was obtained on "CBL session promoted development of interpersonal skills" for which 34.2% participants "agreed" (Table 2). Lowest mean score 3.49±1.48 was obtained on, "CBL session was useful" for which 30.4% participants agreed(Table 1&2).

Table 1: Descriptive Statistics for Perception about CBL

Questions about perception of CBL	Mean	Standard Error	Standard Deviation
1.CBL session was useful	3.49	.16	1.48
2.Clinical case given in CBL session was useful	4.46	.13	1.17
3.I was able to correlate clinical data in the case with learning objectives	3.98	.16	1.44
4.Group discussion during CBL session was useful	4.30	.15	1.34
5.CBL session promoted development of interpersonal skills	4.38	.15	1.34
6.Feedback provided by students was useful	3.65	.17	1.48
7.Feedback provided by teacher was useful	4.64	.14	1.24
8.Your overall impression of Cbl session	3.67	.16	1.43

The mean of eight questions survey was 32.61±7.93 standard deviation (Table 3).A statistically significant result was obtained with Friedman's chi square=85.84 (df=7)p=.000<0.5, for perception of students in CBL session when asked from seventy-nine participants (Table 4).Hence, we accept the alternate hypothesis that there is a statistically significant difference between the means of six levels of the eight within people (subject) factors (independent variable) and the perception about CBL (dependent variable).

Table 2:Student response on Survey

Response (Levels)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Strongly disagree	15.2	1.3	7.6	6.3	3.8	12.7	3.8	11.4
Disagree	11.4	6.3	10.1	6.3	8.9	12.7	5.1	12.7
Slightly disagree	17.7	10.1	12.7	6.3	7.6	11.4	3.8	12.7
Slightly agree	22.8	27.8	30.4	27.8	25.3	29.1	20.3	29.1
Agree	30.4	35.4	24.1	38	34.2	27.8	44.3	29.1
Strongly agree	2.5	19	15.2	15.2	20	6.3	22.8	5.1

Table 3: Overall Survey Statistics

Mean	Variance	Std. Deviation	N of Items
32.61	62.83	7.93	8

Table 4: Friedman's Test

		Sum of Squares	Df	Mean Square	Friedman's Chi-Square	Sig
Between People		612.604	78	7.854		
Within People (subjects)	Between questions	103.342[a]	7	14.763	85.84	.000
	Residual	562.408	546	1.030		
	Total	665.750	553	1.204		
Total		1278.35	631	2.026		
Grand Mean = 4.0759						
a. Kendall's coefficient of concordance W = .081.						

Discussion

Students had a positive perception about CBL, reflected in above average mean score. The results of the study are statistically significant and show that perception of students regarding cased based learning is affected by usefulness of the session, usefulness of clinical cases, their ability to correlate clinical cases, group discussion, interpersonal skills, feedback by students, teachers and their overall impression. Present study is supported by a study conducted in United States of America where thirty-one medical schools reported that CBL was integrated in 75% of courses and more than half agreed that it promotes critical thinking a necessary condition for clinical

decision making and problem solving. , , Another study proposes that perceived clinical relevance as provided by CBL should be used in curriculum as it promotes retention of basic science knowledge in clinical context and continued throughout the medical courses. , A study utilizing thematic analysis of a focus group discussion study of CBL learning identified the following themes; clinical situation, patient data and informing decisions, clinical knowledge, multiple ways of thinking, professional care and professional self-concept. A study conducted in Pakistan regarding perception of medical students regarding case based learning and tutorial format concluded that Case based method was significantly more favored by students compared to traditional tutorial format regarding group dynamics and behavioral influences of facilitators, learning process and environment. However, another study conducted in Pakistan to compare students' perception of the effectiveness of teaching methodologies concluded that students in structured interactive sessions applied clinical reasoning and group discussion better compared to case based learning and interactive lectures. Feedback is an important component of the process of CBL. 44.4% students agreed that feedback provided by teachers was useful. Studies have shown that students received feedback positively when it was directed towards learning. Teachers conducting CBL were trained in the process of conducting it. They were also trained in critical thinking and feedback and this may be the reason for the perception of students as is also proved by a previous study. CBL provides early clinical exposure and develops relationship between basic and clinical sciences resolving an important issue of sequencing of basic and clinical subjects. It facilitates transition of students to clinical environment.[21]

Conclusion

Students have a positive perception about CBL in the subjects of anatomy, physiology and biochemistry when introduced in a modular curriculum. It provides opportunity for good quality group discussions, development of interpersonal skills, critical thinking and hence the ability to solve clinical cases in a safe environment without actual patient exposure.

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