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PERCEPTION OF MEDICAL STUDENTS: COMPUTER ASSISTED LEARNING VERSUS TRADITIONAL ANIMAL EXPERIMENT IN PHARMACOLOGY PRACTICALS

Dr. Dhanasekaran R.[1], Dr. Sumitha A.[2]*, Dr. Ankita Bist[2], Dr. Ajay Kandal[3], Dr. Kalaiselvi B.[4], Dr. Sridevi S. A.[4]

[1]Assistant Professor, Department of Paediatrics, Madras Medical College and Hospital, Chennai.
[2]Assistant Professor, Department of Pharmacology, ACS Medical College and Hospital, Chennai.
[3]Post Graduate Student of DM Gastroenterology, Stanley Medical College and Hospital, Chennai.
[4]Professor, Department of Pharmacology, ACS Medical College and Hospital, Chennai.

*Corresponding Author: Dr. Sumitha A.

Assistant Professor, Department of Pharmacology, ACS Medical College and Hospital, Chennai.

ABSTRACT

Background of study: Computer assisted learning method is followed in pharmacology practical session for undergraduate medical students as advised by medical council of India. This study was done to analyse perception of medical students among computer assisted learning and traditional animal experiment in pharmacology practicals. **Method of study**: 140 second year MBBS students studying at ACS medical college, chennai who have completed their university examination in pharmacology subject were included in this questionnaire based study. Perception of faculty members regarding CAL method and traditional animal experiment method of teaching was also included in this study. **Results:** For more interesting and having better interactive session with teachers, 64% of students opted for conventional animal experiments over CAL. To observe variation in drug response, conventional animal experiments was preferred (72%) over CAL (28%) by students. 69% students found CAL method as user friendly over traditional animal experiment. **Conclusion:** Computer assisted learning will be an alternative for animal experiments for teaching UG medical students, but to instill research enhancing skills among students: traditional animal experiments play a major role. Animal experiments can be considered to teach students for minimal invasive and non dissecting animal experiments in Practicals.

KEYWORDS: CAL, Medical students, Pharmacology practicals.

INTRODUCTION

In Pharmacology practical classes, demonstration of effect of drugs on animal tissues form an integral component. According to MCI norms, software programs like computer assisted learning should be imparted in undergraduate curriculum because of limitations in animal experiments. Various ethical and legal issues were raised for usage of animals in research studies.[1]

Ready availability of animals, purchasing and maintenance of animals are major limitations with animal experiment. Computer assisted learning (CAL) mimic experimental setup of animal experiment. CAL also helps students to acquire knowledge by doing experiments more number of times.[2]

CAL consists of computer based packages, focusing on providing interactive instruction in a specific subject area to students.[3] Whereas in animal experiments, research enhancing skills could be imparted in students. In this

questionnaire based study, mainly perception of students regarding computer assisted learning and practical animal experiment was compared.

METHOD OF STUDY

Second year undergraduate MBBS students who were taught animal experiments during practical classes and completed university practical examination in the year 2019 were included in this Questionnaire based study. This study was approved by institutional ethical committee and students voluntarily willing in participating in this questionnaire based study were included.

Participants in the study

140 undergraduate MBBS students
08 faculty members of pharmacology department

Questionnaire consisted of 10 Questions mainly focusing on perception of students and also faculty members regarding animal simulators (CAL) and experiments

using animals. Questions consisted of better understanding and retaining capacity of students. Comparison of usefulness between computer assisted learning and traditional animal experiments in research enhancing skills of students was included in questionnaire.

For faculty members easy procedure for teaching and interactive session with students and better performance of students during exams were assessed with this questionnaire based study. Questions were set up based on validated questionnaire adopted in study done by Diwanshu Sharma.[4]

RESULTS
Questionnaire based on perception of students and faculty members regarding CAL and traditional animal

experiments are given in Table 1 and 2 respectively. Students preferred animal experiments(59%) over CAL (41%) for better retaining of topic. For more interesting and having better interactive session with teachers, 64% of students opted for conventional animal experiments.

To observe variation in drug response, conventional animal experiments were preferred (72%) over CAL (28%) by students. 69% students found CAL method as user friendly over traditional animal experiment. Based on faculty members questionnaire, conventional animal experiment method of teaching modalities earned a positive feed back from students (90%) over Computer assisted learning(10%). CAL method of teaching (60%) is easy to perform for faculty members and students over traditional animal experiment.

Table 1: Questionnaire based on students perception regarding computer assisted learning(CAL) and practical animal experiment.

S.NO	QUESTIONS	CAL (%)	PRACTICAL ANIMAL EXPERIMENTS(%)
1	Which one of these do you think will be better for understanding the topic?	45	55
2	Which one do you think has better retaining of topic?	41	59
3	Which do you think need less revision of topic during exams?	46	54
4	Which one of these provide more interactive session with teachers?	36	64
5	Which one of these two will have more research enhancing skills?	30	70
6	Which do you think will be more interesting to learn?	28	72
7	Which one do you think need special skills to perform?	26	74
8	Which do you think is easy to perform during exams?	76	24
9	Which one do you think you can observe variation in drug response ?	28	72
10	Which one do you think is user friendly?	69	31

Table 2: Questionnaire based on faculty members perception regarding computer assisted learning(CAL) and practical animal experiment.

S.NO	QUESTIONS	CAL (%)	PRACTICAL ANIMAL EXPERIMENTS(%)
1	Which one of these is effective method of teaching?	20	80
2	Which is cost effective out of these?	50	50
3	Which one among these two methods is easy to perform?	60	40
4	Which one of these provide more interactive session with students?	20	80
5	Which of these teaching modalities need less preparation time for class?	20	80
6	Which one among these two need special skills to perform?	50	50

7	Which of these teaching modalities earned a positive feed back from students?	10	90
8	Which one among these two is more time consuming to explain?	80	20
9	Out of these in which method students performance was better during exams?	20	80
10	Which one among these two will enhance research skills among students?	10	90

DISCUSSION
According to medical council of india, use of computer assisted learning using software was designed in order to overcome limitations of using animal experiments. Software Xcology and Expro was used to teach animal experiments for second year medical undergraduate students. This study was done to analyse perception of students and faculty members regarding CAL and animal experiments.

Questionnaire was given to students and faculty members to evaluate their perception regarding use of computer simulators and animal experiments. Questions regarding research enhancing skills in students and less revision time during exams was included in Questionnaire. Effective method of teaching was asked among faculty members along with ten questions for their perception regarding practical classes.

In CAL programs, pretest and post test questionnaire are available which can be used to test understanding of students. Students can have self directed learning in CAL software.[5] They can learn at their own convenience more number of times by repeatedly doing the experiment using the software. Time resources of faculty is being saved in CAL learning method. In CAL students can perform experiment in their individual computer system whereas in animal experiment, small groups of students only can perform.[6]

Biological variation in response at different doses cannot be observed in CAL, whereas in standard animal experiment in living animals, it can be observed.[7] As per students questionnaire evaluation, CAL experiments are easily forgotten and difficult to recollect. Frequent upgrading of computer assisted learning (CAL) program is mandatory whereas in experiment using animals, it is not needed.[8]

In CAL, technical problems in handling software are difficult to be handled by faculty members which need assistance from technical staff.[9] Test drug administration and monitoring of physiological signs are properly taught by pharmacology teaching faculty only by animal experiment and not by simulators.

According to a study done by Sane MR[10]., Students preferred CAL over conventional animal experiment for better understanding, whereas in our study animal experiments were preferred by students and faculty members for better understanding of subject and for research enhancing skills.

CONCLUSION
Though computer assisted learning will be an alternative for animal experiments for teaching UG medical students, to instill research enhancing skills among students: traditional animal experiments play a major role. Animal experiments can be considered to teach students for minimal invasive and non dissecting animal experiments in Practicals.

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