



AWARENESS IN UNDER GRADUATE MEDICAL STUDENTS REGARDING CARE AND HANDLING OF EXPERIMENTAL ANIMALS: A QUESTIONNAIRE BASED STUDY

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ABSTRACT

The objective of the present study is to access the level of awareness among the under graduate (UG) medical students of RIMS regarding handling of experimental animals. The knowledge of animal experiment is one of the essential component for under graduate medical students in their education curriculum and they spend a good amount of time on that. To understand its importance we conducted the cross sectional questionnaire based study to determine the awareness status on handling of experimental animals among the MBBS and BDS students of RIMS, Imphal, Manipur, India from 21st December, 2017 to 20th January, 2018. Prior to the study initiation, an informed verbal consent was taken from the students. The participants were briefly explained about the study and its importance and asked to join the same. The data was collected by questionnaire method. Descriptive statistics were used. Chi square test was used to test for association between proportions of the data and p value of <0.05 was considered significant. Out of total participants, 76.9% were MBBS students and 23.1% were BDS students. Also 57.7% participants were male and 42.3% were female in total participants. Only 16.5% students were found to have adequate awareness, out of which MBBS students were found to have more awareness than BDS students and were statistically significant with p-value of 0.013. By this study we concluded that UG students had inadequate level of awareness regarding handling of experimental animals. So there should be a provision of extra classes to create awareness among the students.

KEYWORDS: *Awareness, Experimental animals, Under graduate students and Pharmacology.*



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INTRODUCTION

Animal experiments are one of the most important parts of the pharmacological and physiological studies for under graduate and post graduate medical students.¹ The most recent development in experimental Pharmacology is the sophisticated computational simulations of animal experiments, both in vitro and in vivo, referred to as in silico test.² Animal experiments are also one important step for new drug development. Despite many advantages of in silico test the animal experimentation can not be done away with completely, and the drug which is under development is to be administered at some stage or the other, into an animal before it can be passed on safely to humans.² Many controversies are there regarding the use of animals for experimental purpose, but these experiments are also important for learning as the experimental animals can mimic almost similar physiological and pathological changes as in human.³ Various experiments are performed to see the effect of miotic and mydriatic drugs on albino rabbit's eye, analgesic and general anaesthetic studies on rats, anticonvulsant studies on albino mice and rats, local anaesthetic studies by infiltration method in guinea pigs, cardiovascular studies in dogs etc.² These experiments also emphasize on the basic skills in a student graduating as a doctor. So for acquiring expertise in these experiments, firstly proper handling, feeding and drug administration techniques in these animals is a very important perspective as per animal ethical guidelines.² Despite therapid advances in medical fields, and specifically in Pharmacology, no attempts have been made to assess either their relevance or usefulness in the training. The teachers who follow a curriculum which was set decades ago and the students who are the end beneficiaries of such training programs, have seldom been asked about their opinion in this regard.^{4,5} Knowledge of proper drug administration provides better results for the experimental studies, research, thesis work. Knowledge about different strains of animals will be helpful in determining the results because different animal strains have different ability to metabolise the administered drug. Also improper feeding habit leads to the malnourishment of the experimental animals resulting in

sickness and faulty readings. Proper living conditions and space for living is also a very necessary aspect of animal handling because this affects the proper growth of the animal and sometimes one infected animal infects the other. So, proper isolation is necessary.⁶ Roy V et al (2001) did a study entitled "Animal experiments in medical under graduate curriculum: a teacher student perspective" which explained about urgent need for reconsidering changes in the M.B.B.S pharmacology curriculum, especially with regards to the experimental pharmacology exercises, to make it more relevant. Newer alternative teaching methods need to be incorporated. An all out effort has to be made by all the teaching faculty to make animal experiments relevant and interesting for the students.⁷ Dinesh K. Badyal (2014) and Chetna Desai (2014) in their article "Animal use in pharmacology education and research: The changing scenario" explained the use of animals in research and education dates back to the period when humans started to look for ways to prevent and cure ailments. They discussed about a number of computer simulation and recommended other models for use as alternatives to use of animals for pharmacology education.⁸ Keeping the above points in mind we thought it would be important to seek the opinion of the medical students on various aspects of animal experiments for teaching pharmacology as conducted in the present format. So, by this cross sectional study we would to find out the awareness of under graduate students about proper animal handling for which a questionnaire was prepared regarding the proper feeding habits, habitat, proper diet and handling without stressing the experimental animals.

MATERIALS AND METHODS

This study was a questionnaire based cross sectional study, in which participants were medical (MBBS) and dental (BDS) students. The study was carried out in Regional Institute of Medical Sciences (RIMS), Imphal, Manipur, India. The study was approved by Research Ethics Board, RIMS, Imphal- A/206/REB/Prop (SP)49/25/2017. The duration of study was of 31 days and was carried out between 21st December, 2017 and 20th January, 2018 (Table 1).

Table 1
Study Design

Study Type	Cross Sectional study
Study setting	RIMS, Imphal, Manipur
Study duration	31 days
Study population	MBBS and BDS students of R.I.M.S. Imphal
Study Timeline	21 st December, 2017 to 20 th January, 2018

Inclusion criteria

- Those who were willing to participate
- Students currently enrolled in MBBS or BDS stream

Exclusion criteria

- Those who refused to participate
- Those who were absent on the day of visit

Data collection

Prior to the study initiation, an informed verbal consent was taken from the students. The participants were briefly explained about the study and its importance and asked to willingly participate in the study. Data was collected by the questionnaire method. The students were given 15-20 minutes to completely fill the questionnaire.

Study tool

The questionnaire consisted of two parts-

- Part A: Socio demographic data
- Part B: Questions on awareness among the under graduate medical students of RIMS regarding handling of experimental animals

There were total 25 questions out of which 20 questions were based on awareness about handling of experimental animals. Each correct response was given 1 mark and incorrect response was given zero. Students obtaining more than 75th percentile of the obtained score were classified as having adequate awareness and less than or equal to 75th percentile were classified as having in adequate awareness.

STATISTICAL ANALYSIS

The collected data was checked for consistency and completeness and entered in SPSS 21 version software for windows. Descriptive statistics like mean \pm SD and percentage were used. Chi square test was used to test for association between proportions of the data. A probability value of <0.05 was taken as significant.

Ethical clearance

Ethical clearance for the study was obtained from Research Ethics Board, RIMS, Imphal, Manipur A/206/REB/Prop(SP)49/25/2017

RESULTS

In the present study, the total numbers of participants included were 405. In which, 24 were excluded due to in complete filling of questionnaire. In the rest 381 participants, 293 (76.9%) were MBBS students and 88 (23.1%) were BDS students (Fig.1). In case of MBBS students, 167 (57%) were males and 126 (43%) were females. However, 53 (60.2%) were males and 35 (39.8%) were females in case of BDS students (Table 2). The mean ages of MBBS and BDS students were 21.34 ± 1.53 and 21.40 ± 1.68 years respectively (Table 2). Whereas from overall participants (n=381), 220(57.70%) were male and 161 (43.30%) were female (Fig. 2). In the present study, only 63 (16.50%) out of the total students participated (n =381) were found to have adequate awareness about the proper use of animals for experiment. Where as majority of the students 318(83.50%) were found to have inadequate knowledge (Fig. 3). Female participants have more awareness than male participants but was statistically insignificant ($p = 0.222$) (Table 3). Moreover, MBBS students were found to be more aware 56 (19.1%) than BDS students 7(8%) which was statistically significant ($p = 0.013$) (Table 4).

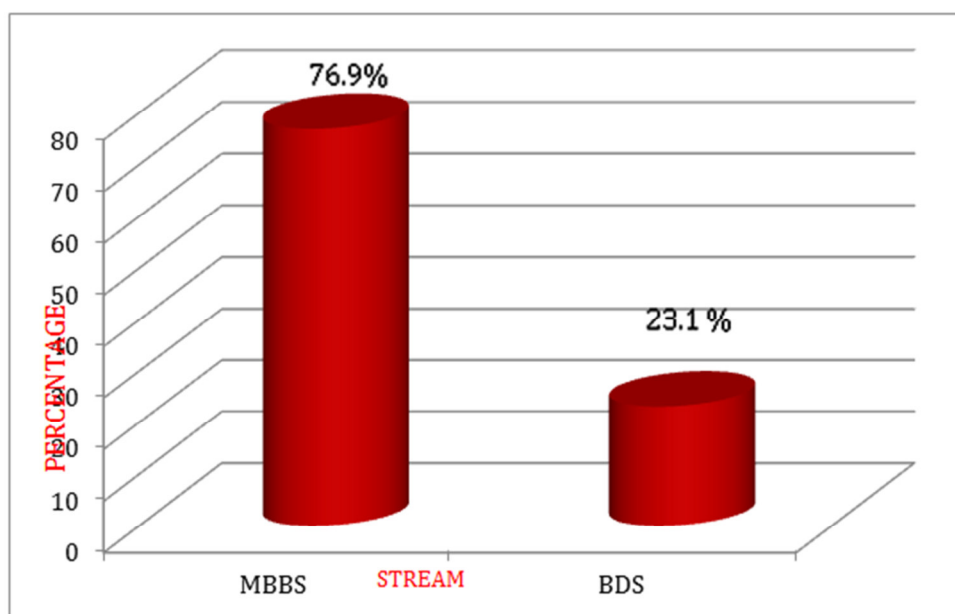


Figure 1
Distribution of participants by stream n=381

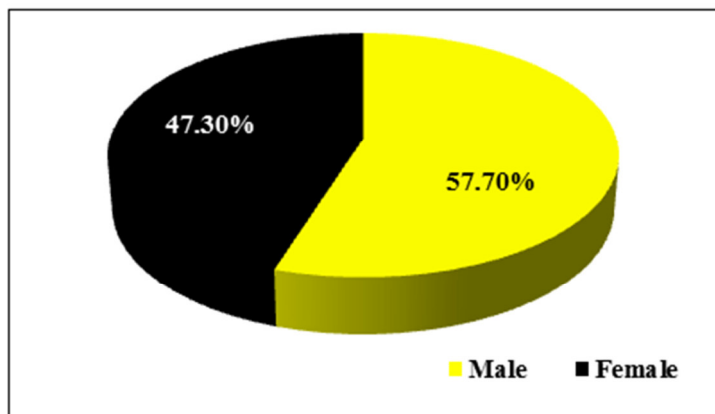


Figure 2
Distribution of participants by gender n=381

Table 2
Socio-demographic characteristics of the participants (N=381)

	MBBS students (293)		BDS students (88)	
Age(Years)	21.34 ± 1.53		21.40 ± 1.68	
	Male	Female	Male	Female
Sex**	167 (57%)	126 (43%)	53 (60.2%)	35 (39.8%)

**The age of participants were expressed in mean ± SD.*

***The sex of participants were expressed in percentage (%).*

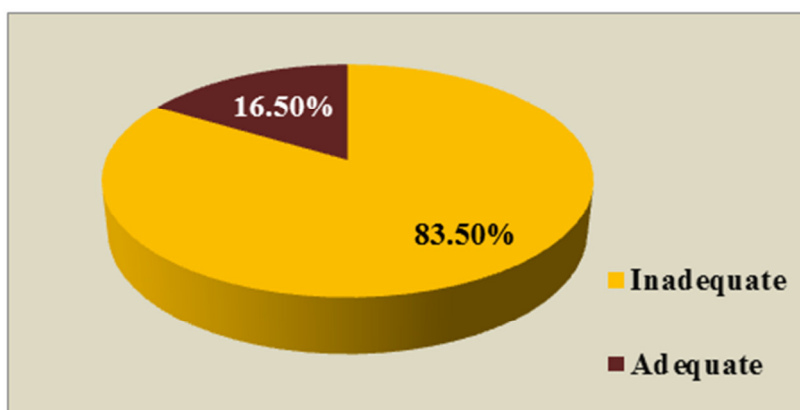


Figure 3
Distribution of participants according to level of awareness n =381

Table 3
The awareness of handling of experimental animals according to the gender of participants

Gender	Adequate Awareness	
	n(%)	p-value
Male	32 (14.5)	0.22
Female	31 (19.3)	

*Data were expressed in percentage (%)
p value < 0.05 is significant*

Table 4
The awareness of handling of experimental animals according to the stream of participants

Stream	Adequate Awareness n (%)	p-value
MBBS	56 (19.1)	0.013*
BDS	7 (8)	

Data were expressed in percentage (%)
**p value < 0.05 is significant.*

DISCUSSION

The experiments on animal model has always important for biomedical research in all over the history of drug development⁹. Animal experiments are important because new interventions in drug development are not always safe in human^{10,11}. In these conditions animal experimentation based studies were frequently used.¹² So, the proper education is need to provide from starting point to students and scholars. There is on-going concern towards the use of animals in research and teaching becomes popular among the scientific community.¹³ Although many studies were conducted to estimating the awareness about the proper use of animals worldwide.¹⁴⁻¹⁷ But, there is a lack of these type of studies in India. Therefore, the present study was planned to evaluate the awareness about the proper use of animals for experiments in the undergraduate medical students of RIMS Imphal, Manipur, India. In the present study, only 16.5% participants were found to have adequate awareness about the proper use of animals for experimental purposes. Similarly Williams et al. in 2007 reported that only 21% participants were interested in use of animals in teaching purposes.¹⁷ In the gender wise results, it was mentioned that females have strong opinions about the use of animals in research, testing and teaching¹⁴⁻¹⁶. Similar results was shown in our study that female participants have more awareness as compared to male participants.

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CONCLUSION

Most of the under graduate students have inadequate awareness and knowledge regarding experimental animal handling with out stressing them. By highlighting the awareness status of the students regarding use of experimental animals for studies, we suggest that there is a need to incorporate extra classes for animal handling in the regular teaching curriculum because improper handling can lead to permanent disability and untimely death in them as every animal life is precious.

AUTHOR CONTRIBUTION STATEMENT

- Dr. P. Shyamasakhi Devi, Dr. Gitashree Dutta and Dr. Tarun Kumar gave the idea of this study.
- Dr. Tarun Kumar and Dr. Priyotosh Banerjee collected the whole data.
- Dr. Gitashree Dutta and Dr. Ritesh Kumar did the data evaluation by using SPSS ver. 21.
- All the authors contributed in writing and correction of the manuscript under the supervision of Head of the Department of Pharmacology, RIMS, Imphal, Prof. N. Meena Devi.

CONFLICT OF INTEREST

Conflict of interest declared none.

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