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ASSESSMENT OF COMPUTER AND BIOSTATISTICS COMPETENCE IN UNDERGRADUATE MEDICAL STUDENTS

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ABSTRACT

Background: The importance of computer and biostatistical methods has been increased from the last two decades in medical research and clinical trial. Knowledge of basic computer and basic biostatistical methods are essential in the medical research to interpret, analyse and present the data. Considering all the above points, we made an effort. Aim and Objectives: To Assess the competence of under graduate medical students in basic computer, basic statistics and biostatistical methods. Materials & Methods: This study was a cross sectional study, conducted during January 2021 to March 2021. By cluster sampling procedure 200 study participants was selected.50 study participants were selected from each MBBS year. Only those participants were included in the study who has attended all the basic computer and basic biostatistics classes. The data was analysed by using SPSS software with version 23. Results: From the 200 study participants, the scores of pre and post tests of basic knowledge of computer is 4.38 ± 0.32 and 8.8 ± 1.49 followed by basic biostatistical methods is 3.52 ± 0.63 and 9.04 ± 1.87 both having significant difference in the mean scores for pre and post tests at $p<0.001$. Conclusion: Basic knowledge of computer and biostatistical methods are mandatory in the medical research, it is necessary as to be update in academic and professional career. New curriculum of medical education, National Medical Council of India introduced the foundation course in computer this will help in enhancing the performance of medical students so they will be at par with the global standards.

Key word: Biostatistical, computer, MBBS, SPSS.

INTRODUCTION

Statistics is the integral part of the medical research. According to H.G.Wells, Statistical thinking will one day be as necessary a qualification for efficient citizenship as the ability to read and write. It is very important for medical researchers to be literate in computer and biostatistics, as biostatistics is frequently used in medical research to design and data analysis. Statistics is the discipline that concerns the collection, organization, analysis, interpretation, and presentation of data [1]. From the past three to four decades in the scientific and research studies the statistics and various statistical methods have been accepted as a powerful tools and it is documented in the medical journals [2-4]. Statistical tools are a cross-disciplinary tool used in medical science, biology, statistics, and social sciences. Hence the demand of statistical application software has been increased due to easy understanding and easy availability.

In developing country like India the use of Information technology has in¬creased tremendously and with the advance in medical research where most of the infor¬mation is easily available on the internet, there is increase in the number of medical students using computer and

internet to upgrade the knowledge and skills [5-6]. Computer skills are essential in the field of medical research to improve the quality of health care, information technology and information processing is very essential in the medical research studies. The computers and information technology represent an essential part of every sphere of human life and process of education/learning in the twenty first century [7].

Research-oriented medical education is very important in undergraduate medical student, they should have knowledge of basic computer, basic biostatistics methods and basic statistical software. Teaching and training of basic computer skills and various methods in biostatistics will increase the standards of research in undergraduate level and also should upgrade themselves to global standards.

METHODOLOGY

Present cross sectional study was conducted during January 2021 to March 2021 at MR Medical College Kalaburagi, Karnataka State, India. Institutional Ethics Committee clearance was obtained prior to start the study. By cluster sampling procedure 200 study participants was selected.50 study participants were selected from each MBBS year (MBBS-I, to MBBS-Final year). Only those participants were included in the study, who has attended all the basic computer skill, basic statistics and biostatistics methods classes. A pilot study was conducted on 10 students and based on pilot study result, modifications were made in the questionnaire. The validity and reliability (test-retest reliability) of the questionnaire was tested. Internal consistency reliability by Cronbach's-alfa coefficient was 0.74. Total 21 questions were asked to the students in which 11 questions are related to the basic computer skills and 10 questions are related to basic

statistics and various biostatistical methods. The questionnaire consisted of information regarding basic computer skills, computer activities, computer training, internet, sources of information and basic statistics, various biostatistical methods and knowledge of statistical software applications, sampling designs, and study designs, sample size. Data collected during the present study was kept confidential. The skills related to basic computer, basic statistics and various biostatistical methods were assessed on visual analogue scale (VAS) scale of 0-10 where zero stands for no satisfaction and ten stands for complete satisfaction. The descriptive statistics were calculated. The t-statistics was calculated to test the statistical significance at $p<0.001$. The statistical software SPSS version 23 was used for data analysis.

DATA ANALYSIS

A total of 200 undergraduate medical students were participated in this study. The collected questionnaire information was coded systematically and entered the coded values in the Ms-excel sheet each scores were entered according to VAS as mentioned in the methodology. The data was tabulated and the frequency distribution table was constructed. The results analysed as follows. The scores of participants with basic computer knowledge and statistical methods are shown in the Table-1 and Table-2. The pre and post test result scores of computer knowledge is 4.38 ± 0.32 and 8.8 ± 1.49 followed by scores of knowledge of various statistical methods is 3.52 ± 1.63 and 9.04 ± 1.87, this clearly shows that, there is increases in the scores after attending the basic computer skills, basic statistics and various statistical methods classes and also shows that there is significant difference in the scores of computer skills, basic statistics and

knowledge of statistical methods in pre and post tests. Table-3 showing the comparison of basic knowledge of computer and knowledge of various statistical methods it shows that there is significant difference between the knowledge of computer and knowledge of various statistical methods in pre and post test at p<0.001.

DISCUSSION

The present study is an attempt to explore the information on competency of medical students in learning of basic computer skills and basic statistical methods and another aim of the study was to develop the students' skills in the field of computerized data analysis and various basic statistical methods. A cross-sectional, descriptive study was conducted with 200 undergraduate medical students. The II and III MBBS students utilized more hours for learning computers and basic statistical software than IV and first year students this might be due to more syllabus to be covered in less time. Our findings and Knapp and Miller III thought that teaching computer and biostatistics to medical students was effective and feasible in wide spread of medical practice as well as the easy availability of statistical software [8]. The computer based statistics teaching is more effective in the undergraduate medical students similar findings from Hutton Jr. et al. found that a computer-based biostatistics course was as good as an equivalent course given as a series of lectures, considering measures that are both objective and subjective [9]. In our study we asked the importance of data analysis and statistical reporting for the small project to the undergraduate medical students similarly reported by Hewett and Porpora the students are not only taught with the aid of computerized and statistics lessons, but they have to do an entire project, including data analysis [10]. By J.Astin.T et.al and M.Rahman

et.al found that medical students themselves do understand the importance and need to learn biostatistics a similar theme that was also found in our study [11, 12]. In our study we found importance of advanced computer based data analysis and statistical procedures were helpful for future medical research studies, similar findings from the Ambrouius and Manatunga [13]. In the new curriculum of medical education, the National Medical Council of India (NMC, India) introduced the foundation course in basic computer this will help in enhancing the performance of medical students so they will be at par with the global standards [14].

CONCLUSION

Our study reveals that, the pre and post scores of basic knowledge of computer is 4.38 ± 0.32 and 8.8 ± 1.49 followed by basic biostatistical methods is 3.52 ± 0.63 and 9.04 ± 1.87 there is a significant difference between the scores for pre and post test. Our study result shows that, there is improvement in the knowledge of basic computers skills, basic statistics and various biostatistical methods after teaching and training classes. In the new curriculum of medical education, the National Medical Council of India (NMC, India) introduced the foundation course in basic computer this will help in enhancing the performance of medical students so they will be at par with the global standards. It is necessary as to be update in academic and professional career. Further attempt should be made to know competency of medical students in learning basic computer skills, basic statistics & various biostatistical methods from the different medical colleges in India.

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Table No.1 Knowledge of Basic Computer Pre-test and Post-test Scores

Pre-Test Basic Computer skills Scores	Post-Test Basic Computer skills Scores	't-test' value	p-value
4.38 ± 0.32	8.8 ± 1.49	38.63	$p < 0.0001$

*p<0.01 is statistically significant.

Table No.2 Statistical Methods Pre-test and Post-test Scores

Pre-Test Basic Statistics & biostatistical methods Scores	Post-Test Basic Statistics & biostatistical methods Scores	't-test' value	p-value
3.52 ± 0.63	9.04 ± 1.87	31.46	$p < 0.0001$

*p<0.01 is statistically significant.

Table No.3 Knowledge of Computer and Statistical methods Pre-test and Post-test Scores

Basic Computer skills test-Scores			Basic Statistics & biostatistical methods test Scores		
Pre-Test Scores	Post-Test Scores	P-Value	Pre-Test Scores	Post-Test Scores	p-value
4.38 ± 0.32	8.8 ± 1.49	p<0.0001	3.52 ± 1.63	9.04 ± 1.87	p<0.0001

*p<0.01 is statistically significant.