International Journal of Community Medicine and Public Health
Bharti et al. Int J Community Med Public Health. 2021 Dec;8(12):5954-5956
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20214595

Original Research Article

Knowledge and attitude on biostatistics in medical curriculum among medical students

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Received: 24 September 2021
Accepted: 01 November 2021

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ABSTRACT

Background: Medical biostatistics has got an important role in the modern medical science curriculum. The present study was planned to assess the knowledge and attitude among medical graduates regarding the role and utility of biostatistics in medical science.
Methods: A cross-sectional study among 120 medical students of MBBS final professional of Saraswati Medical College, Lucknow was conducted by using a pre-designed, pre-tested and semi-structured questionnaire. A Chi-square test was applied to find a statistical association. A p value of <0.05 is considered to be significant.
Results: Most of the students considered biostatistics is important and helps them in their UG/PG curriculum and thesis/dissertation. Fifty-seven per cent of the study participants are aware of any software used in the analysis of data. Males used at least anyone statistical software more than females (p=0.017). The majority of males (70.3%) and females (67.4%) expressed that it is difficult to understand the concepts of biostatistics. Almost all males (97.30%) and majority females (84.80%) reported that biostatistics textbooks need to be written in simple language (p value=0.026).
Conclusions: The role of biostatistics among medical students is of utmost importance as research purpose and importance is increasing in all domains of medical sciences, moreover, the basics of biostatistics should play a pivotal role in the current medical curriculum.

Keywords: Biostatistics, Data, Medical students, Software

INTRODUCTION

Statistics refers to both quantitative data, and the classification of such data under probability theory and the application to them of methods such as hypothesis testing. Health statistics include both empirical data and estimates related to health, such as mortality, morbidity, risk factors, health service coverage, and health systems.[1] According to the Department of Biostatistics, School of Public Health, Boston University, Biostatistics is the application of statistical principles to questions and problems in medicine, public health or biology.[2] Medical biostatistics has got an important role to play in the modern medical science curriculum.

The objective was to assess the knowledge and attitude among medical graduates regarding the role and utility of biostatistics in medical science.

METHODS

The present study was a cross-sectional study conducted at Saraswati Medical College, Lucknow, Uttar Pradesh. A total of 120 medical students were included in the study. Simple random sampling was used to choose the study sample from the total students of the batch. The study tool was a pretested, semi-structured tool that had questions on the knowledge and attitude of students on biostatistics. The tool had questions such as awareness about statistical software and its uses, the concept is understandable, the difficulty of the statistics, prospects of biostatistics in post-graduation and clinical practice.

The data was entered in MS Excel sheet and analysed with SPSS software version 22.0. The Chi-square test was applied to find differences in proportions. P value <0.05 was significant. Written informed consent was obtained and confidentiality of study participants was maintained.

RESULTS

A majority (57%) of the study participants are aware of any software used in the analysis of data. Most of the students i.e. 37 (77.10%) males and 13 (68.40%) females were using SPSS (trial version) while the rest of the students were using R (17.91%) and EPI (7.46%) trial versions. Most of the study subjects were using at least anyone statistical software and males were much higher (63.5%) (p=0.017) (Table 1).

Table 1: Knowledge of biostatistics among the study participants (n=120).

Variables	Male N (%)	Female N (%)	Chi-square	P value
Biostatistics is important for research				
Yes	46 (62.2)	21 (45.7)	3.136	0.077
No	28 (37.8)	25 (54.3)		
Aware of any software used in biostatistics				
Yes	47 (63.5)	21 (45.7)	3.685	0.055
No	27 (36.5)	25 (54.3)		
Knows the name of the software				
SPSS	37 (77.1)	13 (68.4)	0.952	0.716
R	8 (16.7)	4 (21.1)		
EPI	3 (6.3)	2 (10.5)		
Used any biostatistics software				
Yes	47 (63.5)	19 (41.3)	5.653	0.017
No	27 (36.5)	27 (58.7)		

Chi square/Fischer exact test, p value <0.05 is significant

The majority of males (70.3%) and females (67.4%) expressed that it is difficult to understand the concepts of biostatistics. Almost all males (97.30%) and majority females (84.80%) reported that biostatistics textbooks need to be written in simple language. There was a significant difference between males and females (p value =0.026) regarding the attitude on rewriting in a simple language (Table 2).

Table 2: Attitude of study participants on biostatistics. (n=120).

Variables	Male N (%)	Female N (%)	Chi-square	P value
Biostatistics is difficult to learn				
Yes	52 (70.3)	31 (67.4)	0.110	0.740
No	22 (29.7)	15 (32.6)		
Biostatistics is useful in UG and PG research studies				
Yes	74 (100)	43 (93.5)	4.950	0.054
No	0	3 (6.5)		
Biostatistics need to be re-written in simple language				
Yes	72 (97.3)	39 (84.8)	6.404	0.026
No	2 (2.7)	7 (15.2)		
Learning biostatistics is useful in future				
Yes	65 (87.8)	43 (93.5)	5.653	0.017
No	9 (12.2)	3 (6.5)		

Chi square/Fischer exact test, p value <0.05 is significant

DISCUSSION

Karl Pearson has quoted that statistics is the grammar of science. Many studies indicate that biostatistics is now helping budding researchers in clinical research. This study was aimed to identify various facets of biostatistics.[3] In the present study, out of 74 subjects, 62.2% males and 45.7% females accepted biostatistics as a major subject. In a study of practising physicians, it was reported that biostatistics education was deemed "very and exactly important" by 88.19% of the respondents; and 27.8% of the participants did not receive biostatistics education.[4] 70.30% males and 67.40% females admitted they had difficulty in understanding Biostatistics, while 29.70% males and 32.60% females did not face any difficulty. Windish et al mentioned that most of their participants found it difficult to understand many concepts in statistics.[5] Fielding et al had similar findings.[6] They found that small group tutorials, practical sessions and drop-in sessions were identified as being most helpful, with large lectures less preferred. It was felt that basics should be taught face-to-face, preferably in small groups allowing for interaction and explanation, followed up with online material and/or teaching workbooks.

97.30% males and 84.80% females thought that the books about biostatistics, currently available, are difficult. Considering this most of the study subjects opined that the bio-statistics currently available in the medical curriculum need to be re-written in simpler language. This result was statistically significant with p<0.05. Kilic et al thought that biostatistics education is important but claimed it had been inadequate.[7] They emphasized the need for the organization of courses, seminars, etc. regarding biostatistics at sufficient intervals. As a consequence of that, this study reveals the importance of biostatistics and biostatistics education once again in the data analysis process in health sciences. Almost 60% of males were aware of any software being used in bio-statistics. Surprisingly more than 50% of females were

unaware of any software being used in bio-statistics. In the present study, most of the study participants were aware of any bio-statistics software named SPSS as the most popular bio-statistics software being for statistical analysis. R software and Epi info were the next popular bio-statistics software in that order. Vasudevan concluded that research is very much essential for UG medical students.[8] In the present study, none of the participants ever used any professional for bio-statistical help, nor did they pay any professional for the same. In a study conducted by Gore et al, the respondents mentioned various reasons for not seeking a statistician's help, of which the most common were lack of awareness regarding the need for consulting a statistician from the beginning of the research and the non-availability of a statistician at their institute.[9]

100% males and 93.5% females agreed that bio-statistics help in their medical undergraduate and postgraduate studies. That shows that majority of study participants were aware that bio-statistics helps in medical studies. Again 87.8% of males and 93.5% females accepted that the knowledge of bio-statistics will help them in near future and it is an important subject in the medical curriculum. Zhang et al thought that medical postgraduates hold relatively positive attitudes toward statistics except for the difficulty aspect.[10] Swift et al and Windish et al thought that most of the participants in the study agreed that statistics is important.[5,11] Fielding et al carried out a focussed group discussion where a need for basic statistical training within the medical curriculum was indicated.[6]

The students felt an initial reluctance to learn statistics but that it should be incorporated into the curriculum and made compulsory. Students felt the importance of statistics and its application should be emphasized earlier with the basics of statistics taught.

Present study was carried out in a single centre with a small sample size owing to logistics and operational limitation.

CONCLUSION

The role of biostatistics among medical students is of utmost importance as research is increasing in all domains of medical science and as a medical science student, the basics of biostatistics should play a more pivotal role in the current medical curriculum. As research is gaining importance in the present time, knowledge regarding biostatistics plays a paramount role. This study analyses the knowledge, attitude and practices of medical students towards biostatistics. It emphasizes the need for newer methods of teaching, an appropriate curriculum, as well as, books in a simpler language so that students have a better understanding and knowledge of biostatistics. Such interventions will help improve the quality of research.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bharti, Kumar A, Singh A, Chellaiyan VGD, Singh N, Dixit S. Knowledge and attitude on biostatistics in medical curriculum among medical students. Int J Community Med Public Health 2021;8:5954-6.