



Teaching of Subject Biostatistics Its Applications and Research Methodology to Undergraduate Pharmacy Students in Central Region of Saudi Arabia

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Abstract

Background: Biostatistics means statistical tools have been used in the study of medical/biomedical sciences. It is also called Medical Biostatistics/Medical Statistics. It is an important subject in medical, nursing, pharmacy, Bioallied Health Sciences, and other biology related specialties. In this article, I briefly explained my teaching and research methodology experiences to College of Pharmacy (COP) students.


Materials and Methods: Teaching Biostatistics, its applications, and research methods and its implications to the College of Pharmacy students in Saudi Arabia. Online classes were conducted at the time of Covid-19 pandemic time of the year 2020 – 2021 and 2021 – 2022.

Results: I trained COP students in all aspects of Biostatistical tools, their applications, research methods, and other research steps fully. That's why the Statistical thinking is a crucial part of the studies in pharmacy/medical and biomedical areas. COP students followed my instructions in a good way, and they benefited from my teaching and research methods and its steps throughout their graduation study.

Conclusion: I have concluded that teaching of the subject biostatistics and its applications are essential and important to all science and medical specialty students all over the world. Saudi Government must take a necessary step to implement/initiate Biostatistics departments/unit in all colleges separately. It will be very useful to their pharmacist/pharmacy to educate the patients, safe and high-quality care, to control the drugs effect/adherence among patients successfully and to achieve the best high-quality results of patients' health.

Key Words: biostatistics, teaching, research methodology, college of pharmacy, Saudi Arabia

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	<p>DOI</p> <p>10.55349/ijmsnr.2023321416</p>	<p>Corresponding Author: Dr. Senthilvel Vasudevan, Assistant Professor of Statistics, Department of Community Medicine, Sri Venkateshwaraa Medical College Hospital & Research Centre, Pondicherry, India. Email ID: senthilvel99@gmail.com</p>

Introduction

Biostatistics means statistical tools have been used in the study of medical/biomedical sciences. It is also called Medical Biostatistics/Medical Statistics. It is an important subject in medical, nursing, pharmacy, Bioallied Health Sciences, and other biology related specialties. [1] Biostatistics is used to understand the follow of health and biology. It is very much useful to use its powerful tools to developing research hypothesis/questions, designed a study, to get accuracy in the measurements, data analysis, interpretation of the analyzed data, and from that to get a correct conclusion for any types of studies/research. Biostatistics and Epidemiology are the backbone of Science, Social and Preventive Medicine, Public Health, and its research field. [2] Nowadays, Biostatistics is an essential and important to all speciality subjects in developed and developing countries. It will give a proper meaning to the meaningless data/life data. [3] Without biostatistics tools, no one can prove and justify their research findings/results in their research in science subjects. Hence, it is essential and important in the field of research in science, and biomedical research. So, biostatistics unit is needed in all the institutions with well-trained biostatistician/Assistant Professors of higher positions and all sectors also. Then only any institution/organization like academic health centers (AHC) must control their research and development department, progress, efficiently using the biostatistical tools, improve its contributions in the high level of science, its quality, and its growth/support. [4] In this article, I briefly explained my teaching and research experiences related to Biostatistics to the College of Pharmacy students.

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Experiences as a teaching faculty in Saudi Arabia

Very nice experiences of teaching the subject Biostatistics to the undergraduate pharmacy students in College of Pharmacy (COP), King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia. I had been worked in Saudi Arabia in two different times, first time worked as Lecturer in Biostatistics in the year 2014 to 2016 in COP and in second time worked as Assistant Professor of Statistics (Biostatistics) in the year 2018 to 2022 in the same college and department. So, totally I had 7 years of teaching and research experiences in College of Pharmacy, Riyadh, Saudi Arabia. Teaching of Biostatistics to the pharmacy students via online at the time of COVID-19 pandemic of the year 2020 – 2021 and 2021 – 2022.

Teaching Biostatistics in Saudi Arabia

I taught Biostatistics subject initially to the students of Pharmacy and Applied Medical Sciences, KSAU-HS from 2014 to 2016 after that I taught only to the Pharmacy students in the year 2018 to 2022. I asked some relevant questions about Biostatistics and its applications in the class hours itself and I cleared the students' doubts about biostatistics and its applications also by real life incidents and examples. [5]

Research Methodology teaching in Saudi Arabia

I taught research methodology to the Pharmacy students in Saudi Arabia. Apart from this teaching of Biostatistics, I helped to the pharmacy students to prepare their research protocol related to their graduation study, to finalize the methodology part and statistical part, and checking all the aspects/overall of proposed research proposal fully. I taught research methodology to the pharmacy students. How to enter the collected data in Microsoft Excel 2016, to import the data sheet into the SPSS software and how to do the statistical analysis using that? How to write the results and interpretations to the analyzed data to their graduation studies? How to draw a variety of bar charts, pie charts, line diagrams, and suitable pictures/diagrams? [6, 7] Helped the students to prepare their final report and final thesis submitted to the students' research unit after checking in all aspects.

I helped the students to clear their doubts in the statistical concepts whenever they presented some topics in the periodical seminars. At the time of their seminar presentation, I asked some questions related to statistics if they didn't know that thing/concept then I have explained the concept in an elaborate way. Similarly, I had explained at the time of college level conferences also. I helped the students of Pharmacy to present their research data in the national and international conferences and to publish their articles in peer-reviewed national and international journals. I helped the faculty of Pharmacy to present their research data in the national and international conferences and to publish their articles in peer-reviewed national and international journals.

Experiences with the research students at College of Pharmacy:

As a teaching faculty, I gave some two research ideas related to any disease as abstract with some references to the students' research unit.

Pharmacy Research Committee (COPRC) and it would give its recommendations or some modifications. That research ideas list has been sent to all COP students. COPRC has divided all the students into various pairs of groups. Each group consists of two students. Each group of students has selected a topic.

After that, students met the principal investigator for further research process. I gave research idea and its progress to my research students in an elaborate way. I gave instructions to my research students to frame a research question, and according to that to prepare the research proposal for their research. In the preparation of proposal, how to state the primary and secondary objectives? How to prepare the abstract? In that, introduction, methodology – study population, study design, sample size based on some appropriate calculation, study variables, sampling method/technique, inclusion and exclusion criteria, statistical analysis techniques and level of significant. How to prepare the research questionnaire in English as well as in the local language Arabic, prepare the funding (if any), and GANTT Chart also. [8, 9]

After submission of research ideas in the student research unit and getting the permission of the College of Pharmacy Research Committee and then forwarded to King Abdullah International Medical Research Centre (KAIMRC). Within 3 weeks I would get the final approval from it and proceed further process. After getting the permission from KAIMRC, Riyadh, Saudi Arabia then we have started our research. First step, I trained the research students, how to write the introduction part, review of literature? In between, how to collect the data from the KAIMARC database or from the patients directly with the help of patients' consent forms? If any doubt to the students in that, I clarified it then and there.

After collection of data, I trained the students to do the data analysis, depending upon the analyzed data write the results? and then how to write the results/interpretations? and then finally how to write the conclusions for their studies? So, I trained the COP students in all aspects of Biostatistical tools, their applications, research methods, and other research steps fully. That's why the Statistical thinking is a crucial part of the studies in pharmacy/medical and biomedical areas. [9] COP students followed my instructions and advice in a good way, and they benefited from my teaching and research methods and its steps throughout their graduation study. [10]

Without Biostatistics tools, applications, and its implications no one has proved/justified their findings in Pharmacy, other sciences, and other fields. Saudi Government must take a necessary step to implement/initiate Biostatistics departments/unit in all colleges separately. Then only, the pharmacy students must learn and implement the appropriate higher level of statistical tools in the correct way/place in their graduation research/study. By this way only to increase the research interests and scientific technical knowledge among Saudi pharmacy students and to improve the quality of their research. They will become a good and trained Pharmacist/health care professional in their career. It will be very useful to their pharmacist/pharmacy to educate the patients, safe and high-quality care, to control the drugs effect/adherence among patients successfully and to achieve the best high-quality results of patients' health.

Conclusion

I have concluded that teaching of the subject biostatistics and its applications are essential and important to all science and medical specialty students all over the world. Biostatistics, its tools, and applications are an important subject/tools/techniques in the research of science and pharmacy. Saudi Government must take a necessary step to implement/initiate Biostatistics departments/unit in all colleges separately. Then only pharmacy students will become a well-trained and knowledge in biostatistics tools and its applications in Pharmacy, improve the quality of healthcare, to increase the number of research significantly in Pharmacy, reduce the adherence of tablets, and other medications among the patients.

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Here, SV – Senthilvel Vasudevan

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