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What do medical students think about bio statistics education?

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Abstract
Biostatistics classes can cause many medical students to feel frustrated and frantic. Why is biostatistics part of the body of knowledge that is deemed essential and fundamental for the medical student and eventual practitioner? This is a question that many perplexed (because of trying to comprehend biostatistics) medical students ask. To reiterate, not perceiving the practical role (not just the test-taking role) of biostatistics may didn't better motivate medical students to learn–and avoid want to learn–the language, purpose and practicality of biostatistics.

Keywords: Medical students, biostatistics, learning, attitude

Introduction

What Do Medical Students Think about Bio statistics Education?

I would like to share my personal experience in biostatistics teaching and attitude of medical students regarding statistics in the Department of Community Medicine of G. R. Medical College Gwalior. I have been working in the same college as Professor in Community Medicine and I taught the subject biostatistics to the first part of the MBBS Final professional students.

"Statistics is above all the subject most disliked by (medical) students." [1]

Several Studies have suggested that medical students are receiving inadequate training on health and biostatistics topics, [2] although more country-specific research is needed, but we expect that learning statistic may hold true in all countries. As physician know if someone's blood pressure is too high, who decided what a fever temperature was, or if a white blood cell count is out of whack? *Statistics*. Additionally, finding trends in populations are vital to our current understanding of disease/injury and treatments. Examples include determining carcinogens, such as cigarettes or asbestos, finding the source of an outbreak, or determining the best treatment for an ACL tear. Statistics has given us the background to stand upon when determining optimums of care. Most medical students struggle with statistics. Heck, anyone that's not a math major can feel a little uneasy when they find out a statistics class is required. Medical undergraduate and post graduate students find Common Struggle and difficult to find the relevance in a statistical example. Finding out how many times you will get heads versus tails on a coin toss might seem irrelevant when envisioning helping people that are bleeding, screaming, or dying. But the reason you don't just learn anatomy out of a text book is because of the known variability between humans. We use averages and assumptions all the time, but until you look at a cadaver and realize humans can have an extra vertebra the variability found within each individual may not sink in. Medical students find Statistics confusing always because the answer is not cut and dry, like tetanus is caused by *Clostridium tetani*. In statistics you do not memorize and regurgitate equations. It is the concept of the equations that is important to remember and when you would use it. Medical students should comfortable with the purpose of the equation before trying to enter any numerical values. Determine what question is trying to be answered and then choose the equation designed to give the desired result with the known information [3] Most of the Post graduate students (MD, MS) come to me when they are completing their thesis/dissertation just asking to calculate 'p' value but most of them do not know but its meaning! Most of them want that their result must be statistically significant irrespective of their little sample size and without any much importance of it. It's statistically significant! Woohoo! But what does that mean? Statistical significance is used to indicate how big a difference lies between

two groups or samples. Often significance is shown using p values or differences in confidence intervals. Understanding what a p-value indicates and what to look for in confidence intervals give insight as to how important a result is. Having immediate recall to what parametric versus non-parametric data indicates and when it is a parametric data set, understanding standard deviation are concepts used over and over again in biomedical research. These concepts should be on auto-recall as quickly as the names of the different white blood cells.

To better understand medical students' attitudes on biostatistics, we surveyed medical students at the G. R. Medical College Gwalior Madhya Pradesh India. 150 students responded, with an 80% response rate overall. Nearly 48% were female and 100 responses were well distributed across Final MBBS Part I class and 50 responses were among several disciplines of P. G. (MD/MS) students. After making just a little survey in between 100 U.G and 50 P.G students we find the attitudes and perceptions of medical students regarding biostatistics learning. In reply of statement "I am personally interested in learning about biostatistics during my medical school training" only 25% U. G. students has been provide node in comparison to 62% P.G. students. When we asked them "you believe medical students should graduate with a basic understanding of biostatistics" the 34%U. G. students replied yes while P. G. students were more enthusiastic (74% reply in yes). In reply of statement "I believe "biostatistics knowledge can play an active role in shaping treatment decisions of physician", U.G students was seen more confused and 65% U. G. students could not be able to explain, 'how biostatistics knowledge can play an active role in physician skill' while P. G. are more aware and 78% agree to statements that biostatistics knowledge is essential for enhancing physician treatment skill.

Uniformly, students were not interested to learn about biostatistics and hardly believed physicians should have a basic understanding of biostatistics. They also felt that physician opinions can impact treatment decisions but they also felt less strongly about their knowledge of biostatistics and current events of data analysis, and knowledge of biostatistics advocacy. Opportunities and knowledge responses differed in under graduate and post graduate medical students. A high statistically significant difference was observed between graduate and postgraduate medical students in personal interest and importance of biostatistics and physician understanding of biostatistics. U.G. Students also uniformly felt less strongly that student biostatistics knowledge can contribute to their medical carrier compared to P.G. opinions. Adjusting for gender and age differences did not change these findings.

The consistency of results across medical students suggests that these attitudes may reflect a broader trend. Students seem interested in biostatistics and see its value, but are less content with their instruction and engagement on the topic. MCI have opportunities for improvement in their U.G. syllabus curricula. We encourage further discussion to identify strategies for improving biostatistics learning. Standardizing requirements in the accreditation process or including biostatistics questions on licensing examinations should be considered.

I would come to a conclusion the teaching subject of biostatistics is very much essential, need and important also. Research with statistics is very much essential for the UG medical students. Then only they will become a good physician and emerging out good research in the India. By continuous treatment given by a doctor for a long period, then only they will come to know the technique of the line of treatment and the details of the diseases. "Medical students may not like statistics, but as doctors they will [4] "Medical students may not like statistics, but as good doctors they will have to understand statistics [5]

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