ORIGINAL RESEARCH PAPER INTERNATIONAL JOURNAL OF PURE MEDICAL RESEARCH

Medical Science

KEYWORDS: Gender Bias; Academic performance; Student Evaluation; Medical Students

GENDER DIFFERENCE IN ACADEMIC PERFORMANCE OF MEDICAL STUDENTS IN INDIA

Volume - 6, Issue - 5, May- 2021 ISSN (O): 2618-0774 | ISSN (P): 2618-0766

Jibran Ajaz Medical Student, Government Medical College, Srinagar, Jammu and Kashmir, India. jibranajaz@gmail.com

INTERNATIONAL JOURNAL OF PURE MEDICAL RESEARCH

ABSTRACT

Purpose:

Even though much research has gone into the gender bias in academic performance of students, not much has been specifically studied about this trend among medical students. To fill that void in literature the current research was undertaken.

Findings:

Female medical students were found to have better average scores than males, with female students on average scoring 11.82 (out of 550) marks more than male students.

Also the females were found to spend more time per day in reading and have a better handwriting than male students.

Conclusions:

Female medical students in India score significantly more than male students; good handwriting and more time spent studying daily can be among the causal factors of this difference.

INTRODUCTION

Research has often shown differences in academic performance between girls and boys, frequently showing an upper hand for the former.[1]

But this finding is not consistent and varies between subjects tested for, with girls performing specifically better in subjects like literature[2] and psychology[3] while boys performing better in subjects like mathematics and science[2].

Interestingly it has been observed that this gender bias in academic performances are not explained by differences in intelligence as both genders have been shown to have similar Intelligence quotient[4] implying that there should be other causes. These causes include socializing[5], gender bias in teaching[6] and gender related bias in assessment[7].

Also in addition to these, intrinsic factors have also been implicated which include motivation[8], learning strategies[9], test anxiety[10] and personality[11].

Notwithstanding all this, not much research has been done in evaluating the gender bias in academic achievements in the subject of Medicine. One such study was carried out in New Florida, USA, and saw males performing better than females[10]. But given the significant difference in the medical curricula, the evaluation methodologies and other factors, the results of this study can't be generalized to include the population of the Indian subcontinent, where apparently females tend to outshine males. Driven by the motive to test this hypothesis and to find the reasons for this difference in academic performance the current study was undertaken.

OBJECTIVES

1. *To quantitatively analyse the difference in academic scores between the genders.*
   Null hypothesis (H_0): Among medical students of Kashmir, females and males have similar academic performance.
   Experimental hypothesis (H_1): There exists a gender difference in academic performance of medical students in Kashmir.
2. *To find the difference, if any exits, in the prevalence of certain study related behaviors between female and male medical students.*

METHODOLOGY

Cross-sectional study design was used. A sample population of all (150) students of a particular batch (5th Semester) of Government Medical College, Srinagar was taken. The sample consisted of equal numbers of boys and girls, as the 5th Semester batch has equal numbers of boys and girls. And the study was divided into two components.

For studying the difference in academic achievement between genders, the individual scores scored by the students in their second professional university examinations were accessed from the university website[12]. The arithmetic mean of individual scores was calculated for each gender, and the difference found was analysed for statistical significance using the student's t test.

For finding the difference in the prevalence of certain study related behaviors between female and male medical students, a self-administered printed questionnaire was given to each student and was collected back anonymously. In addition to specifying the gender the subject needed to answer;

a) if they took regular lecture notes in the class,
b) if they made personal study notes at home,
c) if they got their textbooks marked by seniors/peers for important topics,
d) if they analysed previous years' question papers before exams,
e) how many diagrams/flowcharts they drew in their answer sheets and
f) how many hours per day they studied in the library and/or their place.

Also the students were required to give a sample of their handwriting in the form of a predetermined sentence.

The prevalence of the first five behaviours was calculated separately for each gender and any differences found were analysed for statistical significance using the chi square test.

Then mean study hours were similarly calculated for each gender and the difference was analysed for statistical significance using standard error of difference between the means and the student's t tables.

The handwriting samples were each ranked on a scale of three by the researcher while being blind to the gender (1=readable with difficulty, 2=easily readable and 3=easily readable and pleasing). The means of these were then analysed similar to study hours.

Due to the complexity and yet absence of significant reliability and validity among the present handwriting assessment scales, the

above outlined simpler method was preferred. Also it was contemplated that if any significant association is found by the simple scale used, this can always be evaluated using the complex scales in another study specific to this end.

The data was collected in 3 weeks' time and was analysed in a week using Microsoft Office Excel.

RESULTS

Gender differences in academic scores

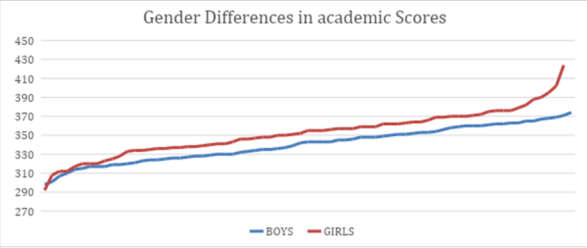

Figure 1: Graph of marks scored by students in second professional university exams, separated by gender.

Out of 550, the mean marks scored by male students in the given examination were found to be 340.2253521, while the mean marks scored by female students were 352.0428571. The difference between the average marks between genders was found to be 11.81751 and the t test gave a p value of 0.001174299.

Gender differences in academic behaviours

1. Difference in the average time spent reading per day.

Boys were found to spend an average of 2.355555556 hours/day reading while girls studied for 3.006666667 hours daily. The *estimated standard error of difference between the means* was found to be 0.288542953, which gave a t score of 2.256548 and hence a p value of .0224.

2. Difference in handwriting.

Boys were found to score an average of 1.733333333 on the handwriting scale used while girls scored an average of 2.013333333. The *estimated standard error of difference between the means* was found to be 0.112477915, which gave a t score of 2.489378 and hence a p value of 0.013.

3. Differences in using review books before exams.

The prevalence of using review books before exams was found to be at 50.66666667% for boys and 34.66666667% for girls. Chi square analysis gave a value of p = 0.047589651 for this difference in proportion 0.047589651.

4. All the other differences in prevalences tested for (lecture note, personal note making etc.) were statistically insignificant.

DISCUSSION

The gender bias in academic scores of medical students was found to be significantly in favour of girls. This was in conformity with our initial hypothesis and in opposition to the trend that was seen in the west.

Also it was found that *girls spend significantly more time studying and have a better handwriting*, both of which can be among the causal factors accounting for the gender difference in academic performance.

It was seen that a *higher proportion of boys use review books* before exams, this might be because they spend significantly lesser time in reading on a daily average basis hence are in more need of review books to cover much topics in the shortest time possible, making the association not a causal one for lesser overall scores.

Also the possibility that the difference in handwriting influences the academic achievement of a *medical* student, should be taken cognizance of, by the regulatory bodies. As this might imply that the current evaluation system is putting more than needed stress on trivialities, as the beauty of one's writing, than the content of one's knowledge, unfortunately making the evaluation less objective towards its actual ends.

And also that females spend more time reading points to a higher motivation on their part, which when combined with their higher scores could mean that motivation plays a more significant part in academic achievement of a medical student as compared to intelligence, at least in the Indian setting.

Limitations

As the results of this preliminary study showed that differences in handwriting scores were significant between the genders and very likely could have played a causal role in the genesis of the difference in academic performance; the limitation that was mentioned above, about the scale used not being a complex one needs to be addressed, and a separate study to this end should be undertaken wherein more well known handwriting scoring systems can be used, to give the finding more credence.

Also it is generally assumed in the beginning of such studies that differences in cognition do not play a role in the difference in academic performances between the genders as the IQs of both the genders aren't significantly different. But this assumption may not hold true in our particular case where males may have a higher IQ than girls yet underperform them, making the role of behavioural influence on academic performance more prominent. This disparity in cognitive abilities is assumed to be present because of peculiarities of the selection process in this particular medical college, which happens on the basis of marks secured in an objective MCQ based exam but females have a reservation of 50% seats in the college due to which the female students are given admission in the college despite scoring lesser compared to males in the common entrance tests.

Also gender bias in assessment may have a strong causal role in the scoring process as most of the teachers/evaluators are males, and hence may tend to favour female students over male students.

Lastly regression analysis, to prove direct association, between the marks obtained by the student and the individual behaviors could not be carried out as the questionnaires were submitted anonymously and did not contain information on individuals scores.

Declarations of interest: None.

FUNDING: The research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

REFERENCES

1. Voyer D, Voyer SD. Gender differences in scholastic achievement: A meta-analysis. Psychological Bulletin. 2014;140(4):1174-1204.
2. Wangu MJ. The impact of gender differences on student's academic performance in secondary schools Ndumberi division, Kiambu county, Kenya in science subjects and languages. [Postgraduate diploma thesis]. [Nairobi]: University of Nairobi; 2014. 73p.
3. Sidney OC, Kusanthan T, Menon JA. Gender differences in academic performance: A case study of psychology students at the University of Zambia. Stud Soc Sciences Humanit. 2015;3(3):131-138
4. Gibb SJ, Fergusson DM, Horwood LJ. Gender differences in academic achievement at age 25. Australian Journal of Education. 2008;52(1):63-80.
5. Kangethe NS, Lyria KS, Nymanga AM. The gender socialization question in education: influence on boys' and girls' academic achievement. European Scientific Journal. 2014;10(19):279-

294.
6. Brady KL, Eisler RM. Gender bias in college classroom. A critical review of literature and implications for future research. Journal of research and development in Education.1995;29(1):9-19.
7. Woodfield R. Gender and mode of assessment at university: Should we assume female students are better suited to coursework and males to unseen examinations? Assessment and evaluation in higher education. 2005;30(1):35-50.
8. Trautwein U, Ludtke G. Students' self-reported effort and time on homework in six school subjects: Between-students differences and within-student variation. Journal of Educational Psychology. 2007;99(2):432-444.
9. Massachi Y. A cross culture comparison of learning styles. [Masters graduate thesis]. [Rochester]. Rochester Institute of technology; 2000. p34.
10. Farooqi YN, Ghani R, Spielberger CD. Gender differences in test anxiety and academic performance of medical students. International Journal of Psychology and Behavioural Sciences. 2012;2:38-43.
11. Carvalho RG. Gender differences in academic achievement: The mediating role of personality. Personality and Individual differences. 2016 May;94:54-58.
12. Database of Second professional MBBS results of batch 2015. [Internet].(Kashmir): University of Kashmir; 2018. Available from: http://egov.uok.edu.in/results/viewresult.aspx