RELATIONSHIP BETWEEN GENDER AND LEARNING STYLE PREFERENCES- A STUDY AMONG UNDERGRADUATE MEDICAL STUDENTS IN SOUTH INDIA

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ABSTRACT

BACKGROUND

Learning style is defined as the manner and condition under which learners most efficiently and effectively perceive, process, store and recall what they attempt to learn. Each student or learner has a dominant learning style. There are theories that speak about the innate differences between male and female in learning. This gender-based differences could affect their learning styles as well. One of the important criteria for academic achievement is to consider the students' differences and to identify their learning style and provide learning programs based on their needs. We wanted to determine the relationship between gender and learning style preferences among undergraduate medical students.

METHODS

This cross-sectional study was conducted among all the 150 students belonging to the first year of MBBS course in a medical college. There were 64 male students and 86 female students in the study population. The C.I.T.E. (Center for Innovative Teaching Experiences) learning styles instrument was used to assess the learning style. This instrument determines the learning styles under three broad areas, like, information gathering, work conditions and expressiveness.

RESULTS

In this study, all the students preferred more than one learning style as a major learning style. This study also observed a statistically significant ($p < 0.05$) difference in the learning style preferences of male and female students.

CONCLUSIONS

It is imperative that the teacher is aware of the student's learning style, and gender differences, so as to develop appropriate teaching-learning methods to address this difference. Institutions of higher education should take gender difference in learning styles into their consideration while developing curriculum.

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BACKGROUND

Learning style is defined as the manner and condition under which learners most efficiently and effectively perceive, process, store and recall what they attempt to learn.(1) There are more than 21 models for learning Styles.(2) Each student or learner has a dominant learning style, based on his or her own goals, needs etc, . Learning style is also the best way by which an individual collects, organizes and learns new information.(3)

Teaching and learning improvement form the base of all activities in an educational institution. (4) If a student needs to achieve academic success, his or her learning styles have to be in alignment with the teaching styles of the instructor/teacher. To be a successful teacher, the faculty members in educational institutions should have an understanding of the student's learning style, apart from mastery in his or her subject domain and pedagogy skills.

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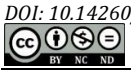

School teachers are more oriented to teaching – learning methods, when compared to faculty members in higher educational institutions like a Medical College, since they usually undergo significant long-term training in Teaching methodologies. The Medical council of India is trying to build the gap by making it mandatory for certain number of faculty in each medical college to be trained in Medical Education Technology.

One of the important criteria for academic achievement is to consider the students' differences and to identify their learning style, and provide learning programs based on their needs.(5) Educational research on learning styles is mainly focused on matching student learning styles with curriculum and various teaching styles.(6) One important reason for student's frustration is a mismatch between the teaching methods of the teacher, and the learning styles of the student.(7) If teaching methods are chosen based on the learning styles of the students, the outcomes are better.(8)

There are lots of factors that affect or interfere with the learning process in an academic environment. Physical factors like, visual or hearing impairment, psychological factors like attitude, motivation, and environmental factors like classroom atmosphere and even the personality of the teacher influence the student's learning.(9)

Similarly, gender is one such factor that affects the student's learning style. There are theories that speak about the innate differences between male and female in learning.(10) This gender-based differences could affect their

learning styles as well. Studies have shown that traditional educational curriculum in India does not support all the preferred learning styles.[11]

In many medical schools, across the globe, the assessment of student learning styles is done periodically to increase awareness among the teachers.[12] This concept is yet to catch-up in India. This study was done on a fresh batch of students in a Medical college to ascertain the relationship between gender and their learning style preferences.

METHODS

There are many methods to assess the learning styles of students. Each and every one of these methods offers a distinctly different view of the learning style preferences. This study used the C.I.T.E. (Center for Innovative Teaching Experiences) Learning style instrument,[13] developed by the Murdoch Teachers Center in Wichita, Kansas for assessing the learning style preferences among students. The instrument consists of 44 statements, and the responses marked on a four-point Likert scale. It is divided into three main areas, Information gathering, Work condition and Expressiveness.

Information Gathering

This area includes auditory language, visual language, auditory numerical, visual numerical, and a combination of auditory-visual and kinaesthetic.

Work Condition

The focus is on whether a student works better alone or in a group.

Expressiveness

This demonstrates whether a student is better at oral or written communication. These are the different learning styles assessed by the C.I.T.E. Instrument-

Visual-Language

The student, who prefers this type of learning style, learns well by seeing words on charts, books, blackboard, etc. They remember information better by reading.

Visual-Numerical

This student prefers numbers on the board or book, to read. He or she has to see numbers to remember it.

Auditory-Language

These students would like to learn by hearing words spoken. One can see them vocalizing while reading. They tend to perform well, if they learn by hearing.

Auditory-Numerical

The students here, learn from hearing numbers and oral explanations, and they are successful with oral numbers, puzzles, etc. They can solve problems in their head.

Auditory-Visual-Kinaesthetic

Here, the student learns by experience and self-involvement. These students seek to touch and work with what is being learned. They prefer to manipulate the material, along with hearing the related sounds and looking at things.

Social-Individual

The student, who prefers this mode of learning, would like to work alone. They care more about their own opinions than that of others.

Social-Group

This student values the ideas and preferences of other students. The student gives importance to socializing. He or She tends tom learn better by socializing.

Expressive-Oral

The student talks clearly and fluently. The student is less shy than others in oral presentations. Since organizing and putting thoughts on paper is tough for the student, the written test may not reflect the true capability of the student.

Expressiveness-Written

This student has his or her thoughts better organized in a theory paper, than while answering oral examinations. These students feel less comfortable while answering oral questions compared to written answers. Scores in the learning style inventory fall into any one of the three categories, Major, Minor and Negligible.

Major

The student feels comfortable with this mode of learning and prefers this for important learning.

Minor

This learning mode is used by the student as a second choice, or in conjunction with other learning styles.

Negligible

The student does not prefer to use this learning style if other choices are available. It's important to note that a student can have more than one preferred learning style. This cross-sectional study was done in a Medical College in Kanchipuram district of Tamil Nadu. The medical college has an annual intake of 150 students, and all the 150 students belonging to the first year of the MBBS course were included in the sampling frame. After obtaining informed consent, and assuring them of complete confidentiality, all the students were administered the C.I.T.E. instrument. The absentees on the day of assessment were followed up on subsequent days, so that all the 150 were enrolled in the study.

Statistical Analysis

The data was tabulated, and analysed using SPSS (Statistical package for Social Sciences) version -18. A Pearson chi-square test was done to determine whether there was a significant association between gender and their learning style preferences.

RESULTS

A total of 150 students belonging to the class of first MBBS took part in the study. There were 64 male students and 86 female students in the study sample. The data for the overall group show that in the area of information gathering, the Auditory-visual-kinaesthetic learning style was the most common major learning style, with was favoured by around 65% of the students, and the Auditory language learning style was the least common Major learning style, with only 30% of

the students following the same. In the same information gathering category, 63 % students, had Auditory-language as the Minor learning style, and only 34% students had Auditory-visual-kinaesthetic as a Minor learning style. None of the students had negligible use of any of the learning styles, except 12% and 6% of them, in visual-numerical and auditory-language category, respectively.

In the domain of work condition, 71.3% of students had social-Individual as the major learning style, and only 46.7% had social-group as a Major learning style. Similarly, in the area of expressiveness, the learning styles of expressive-oral and expressive-written, for many students, were Minor only, and also, 5.3% of students had expressive-oral as a negligible learning style. Details are given in table -I.

Learning Style	Learning Style Category		
	Major	Minor	Negligible
Information Gathering			
Visual - Language	74 (49.3%)	76 (50.7%)	-
Visual - Numerical	63 (42%)	69 (46%)	18 (12%)
Auditory – Language	46 (30.7%)	95 (63.3%)	9 (6%)
Auditory - Numerical	61 (40.7%)	89 (59.3%)	-
Auditory-Visual-Kinaesthetic	98 (65.3%)	52 (34.7)	-
Work Conditions			
Social-Individual	107 (71.3%)	43 (21.7%)	-
Social-Group	70 (46.7%)	71 (47.3%)	9 (6%)
Expressiveness			
Expressive -Oral	61 (40.7%)	81 (54%)	8 (5.3%)
Expressive-written	56 (37.3%)	94 (62.3%)	-

Table I. Different Learning Styles Preferred by Students: (n-150)

Learning Style	Sex	Learning Style Category			Chi-square	p-Value
		Major	Minor	Negligible		
Information Gathering						
Visual - Language	Male	40 (62.5%)	24 (37.5%)	0	7.742	0.005
	Female	34 (39.5%)	52 (60.5%)	0		
Visual - Numerical	Male	16 (25%)	40 (62.5%)	8 (12.5%)	6.879	0.032
	Female	39 (45.3%)	37 (43%)	10 (11.7%)		
Auditory – Language	Male	18 (28.1%)	46 (71.9%)	0	8.219	0.016
	Female	28 (32.5%)	49 (57%)	9 (10.5%)		
Auditory - Numerical	Male	16 (25%)	48 (75%)	0	11.355	0.001
	Female	45 (52.3%)	41 (47.7%)	0		
Auditory-Visual-Kinaesthetic	Male	32 (50%)	32 (50%)	0	11.588	0.001
	Female	66 (76.7%)	20 (23.3%)	0		
Work Conditions						
Social-Individual	Male	42 (65.6%)	22 (34.4%)	0	1.779	0.182
	Female	65 (75.6%)	21 (24.4%)	0		
Social-Group	Male	32 (50%)	32 (50%)	0	7.131	0.028
	Female	38 (44.2%)	39 (45.3%)	9 (10.5%)		
Expressiveness						
Expressive -Oral	Male	30 (46.9%)	34 (53.1%)	0	7.027	0.030
	Female	31 (36%)	47 (54.7%)	8 (9.3%)		
Expressive-written	Male	18 (28.1%)	46 (71.9%)	0	4.046	0.044
	Female	38 (44.2%)	48 (55.8%)	0		

Table II. Sex Differences in The Learning Styles Among the Study Subjects

In each of the learning style category, sex difference was analysed. It was observed that 62.5% of male students had Visual-language as a major learning style, in contrast to 39.5% of the female students. Similar was the case with Visual-Numerical, wherein, more female students (45.3%) had this as a major learning style, compared to male students. Moreover, 12.5% of female students and 11.7% of male students had negligible use of this learning style. In the Auditory-Language learning style category, 71.9% of male students and 57% of female students had it as a minor learning style only, and 10.5% of females considered it to be negligible learning style, whereas, none of the male students opined that it is negligible. Likewise, 76.7% of the female students had, auditory-Visual-kinaesthetic as a Major learning style, compared to only 50% of the males. In the area of information gathering, there was a statistically significant difference between male and female students in all the five learning styles. Details provided in table- II.

The sex difference in learning styles under the category of work conditions, also paints more or less a similar picture. The social-individual learning style was the major learning style among 65.6% male students and 75.6% female students. Whereas, the social-group learning style was the major learning style in 50% of the male students and 44.2% of the female students, and for around 10.5% of the female students, social-group was a negligible learning style. This difference among the sexes in the Social – group learning style was found to be statistically significant.

In the domain of expressiveness, 46.9% of male students and 36% of female students had expressive – oral as their

major learning style and among the later, 9.3% had expressive-oral as a negligible learning style. Similarly, 28.1% of male students and 44.2% of female students had expressive-written as a major learning style. This difference between the two sexes was found to be statistically significant. Details are given in table –II.

DISCUSSION

Though the primary objective of this study was to assess the gender difference in learning styles among undergraduate medical students, the overall picture of the prevalent learning styles among the study population showed that all the students preferred more than one leaning style as a Major one. In a similar study done at the University of Michigan,[14] it was observed that most students preferred multiple learning styles. Studies have shown that, for effective learning to occur, students need to apply multiple learning styles in different learning situations. Especially, students of medicine should be advised to apply multiple learning styles in their learning period.[15] This study was conducted only among the first year MBBS students in one chosen medical college, where, both the genders are exposed to similar subject matters, teachers and teaching methodologies. But, the majority of them come from different demographic backgrounds. Nasirzadeh[16] opined that demographic characteristics can affect the learning styles of students. It's also true that learning styles are not fixed, and can change over time, due to the influence of the teaching methods, subject and leaning environment.[17]

This study observed a significant difference between the male and the female students in their learning style preferences in all the three areas assessed, ie.. Information gathering, work conditions and expressiveness. The only learning style which had no significant difference between the sexes was Social-Group, where more or less the similar percentage of male and female students preferred the social-individual as a major learning style. Couple of studies conducted by Sarabi et.al,[18] and Mohammadi et. al,[19] observed a significant relationship between gender and learning styles. Another study done by Honigsfeld et.al,[20] in 5 different countries also observed a relationship between gender and learning styles. A study done by Amni and others, [21] found some difference between gender and learning styles, but the difference was not statistically significant. On the contrary, there were also some studies[22] that did not find any difference between the genders in their preferred learning styles.

Some literature is available on this topic of Gender difference in learning. Studies have shown that male students have a preference for rational evaluation and logic, whereas, women try to look for a individual connection, or personal relevance with the material that is thought.[23] Male students tend to be more achievement oriented, whereas, female students are more socially and performance oriented.[24]

CONCLUSIONS

This study done among medical students, observed a significant association between gender and their learning style preferences. So, it becomes imperative that the teacher is aware of the student's learning style, and gender differences, so as to develop appropriate teaching methodologies to address this difference. Institutions of higher education should take gender difference in learning styles into consideration while developing curriculum. As mentioned by Lie et al, [23] this gender difference in learning style preferences support mixed gender classrooms and study groups in institutions, so that both the genders can complement each other in the learning process.

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