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Assessing Role of Metacognitive Awareness of Reading Strategies in Academic Achievement Among Medical Students

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Abstract

Introduction: To determine the role of metacognitive awareness of reading strategies on the academic outcome of first year medical students and to compare them according to gender for the existence of visible differences

Material and Methods: Study was conducted among second year medical students of a government medical college, Kolkata. Metacognitive awareness of reading strategies inventory (MARSI) questionnaire was administered.

Result: It was observed that very good, good and average students preferred more of support reading strategies than global strategies. statistically positive correlation between the different subscales and the overall strategy utilization with academic performance. Only female students belong to academically very good category.

Conclusion: Our study found that these three dimensions of metacognition are inter related with each other and predictors of metacognition and good academic performance. In the present study, it is very much evident that global, support and problem solving, all the three reading strategies are the predictors of the main concept of metacognition so there are chances that they would be correlated with each other.

Keywords: NIL

INTRODUCTION

Metacognition is a concept which is becoming increasingly popular in education. Ever since the Education Endowment Foundation Toolkit highlighted metacognition as one of the most cost-effective ways to help students improve their learning, more and more schools have started teaching metacognition in the classroom.

Metacognition is one of the subtypes of cognition and it is usually described as a person's thinking or a set of processes an individual uses in monitoring ongoing cognition [1]to control his or her own behaviour [(1) (2)]

There are different types of metacognitions. These include:

Metacognitive knowledge – this means awareness of the students of what they do or don't know about their cognitive processes. It includes knowing their strengths, weaknesses, and identifying gaps in their knowledge. This type of metacognition also refers to knowledge of skills that students may use to solve a problem.

Metacognitive regulation – Metacognition regulation depends upon global reading strategy (this strategy can be thought of as generalized or intentional reading strategies), problem solving strategy (this strategy can use when problems develop in understanding textual information) and support reading strategy (this strategy can involve use of outside reference materials, taking notes, and other practical strategies. [(3)]

For example, identifying that a particular strategy is not giving them the results that they want and deciding to try a different one is an instance of metacognitive regulation.

We don't often like to believe we are wrong but being able to take a step back and assess your own thoughts plays a key role in becoming an independent learner.It is important to be aware of our skills and what we can and can't do. Those who lack metacognitive thinking tend to overestimate themselves. As a result, when they don't succeed, they suffer a major setback.

Students usually adopt different reading strategies. However, acquiring these techniques has been subconscious and they have had no formal training in various reading strategies.

Many Recent researches have explored a strong relationship between metacognition level and academic performance of students. (4) (5)

For medical students this study will be to improve their metacognitive skills and to achieve academic goals.

The beginning of medical school can be a challenging time for medical students. Students join the medical course with good pre-med scores but are disappointed with their performance in professional colleges resulting in a major setback. This is a major source of stress not only for the students but also for the educators and parents

Most medical students are exceptionally bright individuals, as expected, which means that many did not have to study very hard to perform well in their undergraduate courses. As a result, some medical students arrive in medical school without well-established study strategies and habits, leaving them overwhelmed as they adjust to the pace and rigor of medical school coursework. Even more concerning is that at the first place many medical students don't realize that they don't know how to study, or that their study strategies are ineffective, until after they've performed poorly on an exam.

It is important to know what the students think and do while reading medical books. This reveals valuable information about their way of are monitoring, evaluating and planning and making a sense of what they are reading.

Few researchers established the fact that metacognition is important in reading comprehension of medical students because it differentiates between skilled and unskilled readers.

Medical Students who are good at reading books usually connect what they are reading right now with their previous knowledge, and they can tell what may be coming next. At the end of session, they can sum up the whole reading experience. Metacognitive understanding is strongly related with academic outcome of the medical students. [6] Educational achievements of medical students are strongly influenced by the adoption of different reading patterns.

To achieve an optimal learning outcome, awareness of reading strategies is of paramount importance. But in the present Indian scenario, academic pressure and peer pressure do not give them an ability to use strategies adequately.

Hence a paradigm shift has begun, causing a change in curriculum from teacher centric approach to a learner centric approach making it necessary for students to concentrate on their metacognitive awareness.

Though this has been the topic of discussion in many forums, no reasonable explanation has been offered for the poor performance of these students. This issue has been addressed in the West and research on the learning pattern of students has been investigated.

OBJECTIVES:

- To analyse the role of metacognitive awareness of reading strategies on the academic outcome of first year medical students.
- To compare them according to gender for the existence of visible differences
- To analyse the overall metacognitive awareness of reading strategies and also the subscales like global reading strategies, problem solving and support reading strategies in first year medical students.

MATERIAL AND METHODS

The present study was a cross-sectional study. This study period was from January to June 2019 and was conducted among second year medical students at Calcutta National Medical College and Hospital.

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Pre-sensitization was done with respect to the purpose of the study. Participants were instructed to mark the answer that stroke first to their mind after reading the questions. 20 minutes given for the response.

The students were explained that the results of this study will be presented. Consent from students was taken and privacy and confidentiality were ensured.

Second year MBBS students who were present on the day of data collection were encouraged to enrol for study purpose.

The Sample size of the current study was 196 students. Out of 196 students, 182 participated with written consent, out of which 6 participants were excluded due to incomplete information. Thus, data of 176 students were analysed which consisted of 96 males and 80 females.

The questionnaire, Metacognitive Awareness of Reading Strategies inventory (MARSI) (Version 1.0) developed by K Mokhtari and C.A. Reichardin was used in this study [(7)]. The data obtained from the instrument as a means of monitoring students' progress in reading: estimating, schedule, regulation, and conditional the knowledge. This 30-item inventory was specifically developed to measure adult metacognition and reading comprehension. In several countries this instrument has been applied and the results appear upto the mark. This instrument has an established validity and reliability. The questionnaire consists of 30 statements over 3 subscales which test the global reading strategies, problem solving and support reading strategies.

Global reading strategies: - These strategies are oriented towards a global analysis of the text that is it sets purpose for reading, previewing text, content or predicting what the text is about. 13 items are included in this subscale and the maximum score attainable is 65. [(7)]

Problem solving strategies: - These help to navigate through the text skillfully. These strategies to be used when problems develop in understanding textual information. The maximum score is 40 and 8 items are included here. [(7)]

Support reading strategies: - Involves the use of reference material to aid in the learning process. The aim of the support mechanism is to sustain responsiveness to reading. 9 questions are included in this subscale with 45 as the highest score. [(7)]

Overall reading strategies: - The constant interplay of these 3 strategies forms the overall strategy used by the reader and influences his comprehension ability [(7)]

It follows a 5-point Likert scale ranging from 1 (I never do this) to 5 (I always do this). MARSI has a maximum score of 150 which includes a score of 65 for global strategies, 40 for problem solving and 45 for support reading strategies.

Academic scores:

The overall performance of the students throughout the year was tabulated and analyzed.The average scores for each subject were tabulated and the overall average of each student was obtained. According to marks obtained the study group was categorized into very good (>75%), good (65-75%), average (50-65%) and poor scorers (<50%). Academic performance has been measured in terms of marks, whereas a standard scale for the measurement of Metacognition score was used. Academic performance has been measured on the basis of first professional marks,

The overall average and the mean for each subscale were calculated. Based on this, the reading awareness of the students was classified as low (<2.5), medium (2.5-3.5) and high (>3.5). This inventory serves as a catalogue of all the strategies used by the student while reading academic material.

Statistical analysis: Descriptive analysis like frequency, percentage, mean, standard deviation reliability assessment and inferential analysis by Correlation and Regression analysis by general multivariate linear model were carried out; by SPSS version 2

Results:

In the present study 176 students participated out of which 45% were girls. Out of total 176 students 11 (6%) students were academically very good, 61 (36%) were good, 95 (53%) students scored average and 9 (5 %) students were from academically poor category.

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Table 1. Comparison of the academic scores with reading strategies

Academic Scores		G-MEAN	P-MEAN	S-MEAN	O-MEAN
Very Good	N	11	11	11	11
	Mean	4.39	4.89	4.50	4.58
	SD	.22	.09	.29	.19
Good	N	61	61	61	61
	Mean	3.48	4.10	3.48	4.03
	SD	.59	.23	.59	.37
Average	N	95	95	95	95
	Mean	3.12	3.90	3.12	3.32
	SD	.73	.80	.78	.69
Poor	N	9	9	9	9
	Mean	2.95	3.38	2.56	3.14
	SD	.41	1.24	.61	.65

G – global reading strategies; P- problem solving strategies; S- support reading strategies; O-overall strategies

Table-2: - Comparison of the academic scores with reading strategies according to Gender

			G-MEAN	P-MEAN	S-MEAN	O-MEAN
Female	Very Good	N	11	11	11	11
		Mean	4.39	4.89	4.54	4.50
		SD	.22	.09	.29	.19
	Good	N	38	38	38	38
		Mean	3.43	4.70	3.50	4.21
		SD	.54	.21	.30	.27
		N	30	30	30	30

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	Average	Mean	3.31	3.83	3.26	3.37
		SD	.60	.71	.73	.59
	Poor	N	1	1	1	1
		Mean	1.62	2.69	1.77	3.00
		SD	_	_	_	_

Academic Scores			G-MEAN	P-MEAN	S-MEAN	O-MEAN
Male	Good	N	23	23	23	23
		Mean	3.38	4.69	3.41	3.42
		SD	.67	.26	.62	.44
	Average	N	65	65	65	65
		Mean	3.07	3.93	3.30	3.35
		SD	.78	.84	.81	.74
	Poor	N	8	8	8	8
		Mean	3.12	4.33	2.85	3.16
		SD	.79	.56	.68	.75

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Table 3: - Correlation between academic score with reading strategies

	Global Strategy	Support Reading Strategy	Problem Solving Strategy	Overall Strategy	Predictor
Academic score	176	176	176	176	N
	.484**	.567**	.458**	.553**	R
	.016	.001	.012	.034	Significance

*Significant (p<0.05)

** Highly significant (p<0.01)

Table 4:- Regression analysis by general multivariate linear model: predicting academic performance based on the reading strategies

		Df	Mean Square	F	P Value	R	R Squared
Academic Score	G-Mean	1	2621.658	56.538	0.046	.495[a]	.245
	P-Mean	1	2226.251	45.768	0.025	.456[a]	.208
	S-Mean	1	3358.249	79.699	0.016	.560[a]	.314
	O-Mean	1	3398.898	81.114	0.032	.564[a]	.318

***significant (p<0.05)**

G- global reading strategy; O- overall reading strategy; S- support reading strategy; P- problem solving strategy

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Discussion:

Total 176 second year medical students participated in this study. The overall performance was tabulated based on the scores obtained throughout first year, in Anatomy, Physiology and Biochemistry and then analysed. The students were marked for all the three first year subjects, Anatomy, Physiology and Biochemistry, but for the purpose of analysis and discussion the overall average scores of each individual student were considered.

The average scores for each subject were computed and the overall average of each student was obtained. Based on this, the study group was classified into very good (>75%), good (65-75%), average (50-65%) and poor scorers (<50%).

According to academic scores, we found that out of 176 students, 6% students were from very good category, 36 % from good category, 53 % from average category and 5% from poor category.

From table 1. On exploring the reading strategies adopted by the participants, it can be concluded that majority of the students adopted problem solving strategy compared to other subscales. Similar findings were noted in a study conducted by Panchu P, Bahuleyan B et al, 2016 and Yen-ju Hou, 2013 Mohadeesh Rastakhiz and Mansoureh Roudgar Safari, 2014[).(8)(9)(10)]

It was observed that very good, good and average students preferred more of support reading strategies than global strategies. Whereas the poor students were found to use more of global reading strategies than support.

Hence, important role of support reading strategies can be noted that to become a skilled reader which in turn reflects on their academic outcome.

These similar findings were explored in a study conducted by Salarifar MH and Pakdaman SH, 2009[(11)]). Haffman B and Spatariu A, 2008 also reveals equivalent findings in a study [(12).]

Another study conducted at Lahore, revealed the similar fact [(13)]

Table 2 exhibits, only one female student belongs to poor category base on academics scores, whereas 8 male students obtained poor academic scores. Female student with poor academic outcome followed the same order of reading strategies as that of the students with good academic scores, but strategy usage level is low. Whereas male students with poor academic scores, used global strategies more than support reading strategies, but usage level is medium.

These findings are in concurrence with Mohadeesh Rastakhiz et al. [(10)]. The findings of present study are contradicted by the findings of Mokhtari et al. [(7)]

According to Amzil, students having metacognition skills training scored higher than other students who didn't have good metacognition skills [(14)]. So much debates between many researchers went on the fact that metacognitive awareness is more related to performance than [(15,16)] intelligence. On comparing the academic scores with subscales of reading strategies according to Gender, it has been explored that, female participants tend to perform very well academically, who adopted problem solving, support reading and global strategies in this order. Male participants who performed well academically, preferred that same order of reading strategies, but the strategy usage levels are only medium. On comparing the good scorers, It is also noted that females are high frequency users of the overall strategy, while males are only medium users.

Only female students belong to academically very good category. These observations go with the findings of a study done by Panchu P et al [(17)]

If they had better usage of strategies, they may have been able to reach the 'very good' category. Of special interest was the strategy usage by the poor scorers of both sexes, and it was found that females have the same preferential use of strategies as the very good and good female scorers, but the level of strategy use was low.

In contrast to the result of present study, another study conducted by Sawhney et al could not find significant difference in meta-cognitive awareness of female and male [(18)]

Table 3 shows that there is a statistically positive correlation between the different subscales and the overall strategy utilization with academic performance

Positive correlation of support reading strategy with academic outcome is highly significant.

Whereas in a study conducted by Panchu P et al [(17)] it is observed that problem solving strategy is not positively correlated with academic performance.

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It is required for the medical students to be skilled and effective learners and the observations made by the other researchers may not be applicable to this unique subset of students. With an evident lack of information in this regard, the students are at a disadvantage because remedial measures cannot be implemented. Further research in this field is hence advocated.

Table 4 shows the regression analysis done by general multivariate linear model. Here we find that global reading, support reading and overall strategies are predictors of academic performance in medical students. This is contradictory with the findings of Mousavi et al [19]

Ultimately, the goal of improving medical students' metacognitive skills is to ensure that these students will go on to become competent physicians who are able to identify their areas of weakness, create a plan to address their deficiencies, and monitor and evaluate their progress to meet their learning goals. Thus, they have to learn by facing new tasks every day in their professional life. Medical students must prepare themselves to cope with the evolving uncertainties and changes for which a sharp intellect is an essential requirement.

Conclusion: -

Our study proved that academic performance and metacognitive score are significantly related. Our study found that these three dimensions of metacognition are inter related with each other and predictors of metacognition and good academic performance.

In the present study, it is very much evident that global, support and problem solving, all the three reading strategies are the predictors of the main concept of metacognition so there are chances that they would be correlated with each other's. incorporating single reading strategy would not help much in achieving good academic outcome and reading skill. Hence linking these dimensions with each other should be done .

Number of researches based on metacognitive readings strategies are not satisfactory. Moreover, most of researches regarding metacognitive reading strategies conducted upon students of other fields rather than on medicos. Though metacognition has an immense importance on the students of every field, still it is necessary to do sufficient research regarding reading strategies of the students of medical field, as such skills are necessary for physicians to maintain competence in an ever-changing healthcare environment.

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