

ORIGINAL ARTICLE

Utility of iRat as a Tool to Identify Low Academic Performers in 1st Year MBBS with High Scores in Pre-Medical Examination

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ABSTRACT

Objective: To identify low performers by utilizing individual readiness assurance test (i-RAT) scores in first year MBBS students using Team-based learning (TBL) strategy.

Study Design: Cross sectional observational study

Place and Duration of Study: Study was conducted in Federal Medical College Islamabad from 10th January to 31st March 2022.

Materials and Methods: TBL were introduced in 1st year MBBS. Six TBL activities were practiced by Anatomy Department during the 12-week respiratory and CVS course program. Premedical examination scores, first week individual readiness assurance scores and average i-RAT scores of 6 weeks were gathered. Mean and standard deviation were calculated. Difference in the first week i-RAT scores of three groups based on their premedical examination scores i.e., upper percentile group (A), middle percentile group (B) and lower percentile group (C). Each group comprised of 37 students, was calculated using One Way ANOVA Method. Pearson correlation coefficient (r) was used to access strength and direction of linear association between premedical examination scores and i-RAT scores. The data was analyzed in the statistical package for social sciences (SPSS) version 21 for analysis.

Results: High scorers in premedical examination (Group A) showed lowest scores in first week iRAT (i-RAT 1) and Average i-RAT when compared with group B and C with significant p value < 0.05. Significant increase was seen in progressive i-RAT scores in all 3 groups. Negative linear association (r= -0.2) was found between premedical examination scores and i-RAT 1 scores. A strong positive linear association with r= 0.54 was found between first i-RAT and average i-RAT scores.

Conclusion: High achievers in premedical examinations struggled the most in 1st year of medicine.

Key Words: *Individual Reassurance Test , MBBS, Premedical Scores, Team Based Learning.*

Introduction

Study of medicine is a challenging and tortuous course. It is declared as one of the lengthiest and stressful academic programs.¹ Once entering MBBS, students require knowledge and skill to gain marks that will be sufficient for them to become good doctors in future. Students are selected on merit in 1st year MBBS but at the end of year show poor performance irrespective of their premedical

exceptional scores. Admission to medical college is extremely competitive. Medical studies are associated with chronic and high stress, and evidence has shown that such stress is linked to worse performance, intentions to quit, and elevated depression.² Literature has given the evidence that previous academic performance is used as a predictor for future performance in studies of selected students in a medical college though relation of antecedent scores with future performance in medical school years need to be explored.³

Studies have shown that pretest identifies low performers that might need extra support in learning and once the students at risk are identified educational intervention can help support such students.⁴ For this purpose to identify low performers in 1st academic year of medicine with high premedical scores i-RAT is used in this study while conducting TBL exercises.

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TBL is one of the popular and effective strategy used in different educational systems.⁵ Many medical colleges have been using this strategy as primary mode of learning in undergraduate medical setup.⁶ The benefits of TBL have been documented in literature many times stating that learning among students increases by active engagement in teamwork and practical skill.⁷ Medical curriculum can be strengthened by implementing this instructional approach format, in earlier phases of the first year program where the focus is on basic science, leading to clinical importance as students move towards clinical years.⁸

Team based learning exercise for implementation is divided into three phases; preparatory phase; where students study before they come to class, readiness assurance test; where students take both individual and team assurance test to assess their understanding of pre-class material and application phases, where students apply learnt knowledge. In last phase students work as a team to share and improve learning.^{9,10}

Individual readiness assurance test (i-RAT) helps to assess understanding of desired topic from pre class study directions and individual preparation. Team readiness assurance test (t-RAT) gives student an opportunity to get immediate feedback on assessment and team learning. The activity center around students being engaged in groups to solve problem related to topic of concern.¹¹

i-RAT scores can be used to identify struggling students.¹² Single TBL exercise exposure of first year students of medicine were helpful in identifying top performers and struggling ones.¹³ Individual readiness assurance test has significant value as literature suggests that it helps to pin down students that might not perform well in academic years of MBBS. TBL programs result in improvement in results of final examination of students interpreting that academically underperforming students are more assisted by team bases learning methodology.⁷

Research has been conducted previously to determine factors like personality, IQ, peer and family pressure contributing to be responsible for low performance in students of 1st year medical college.¹⁴ Less evidence is available how to identify these low performers especially those with high premedical examination scores.

TBL activities help in tracking down students at peril to show low academic results. Such students require early interventions to strengthen their performance and educational experience. TBL methodology can be used as a tool for early screening out of students that might perform below par in first year of MBBS irrespective of being high marks achievers in premedical examination. The purpose of carrying out this research project was to utilize an active learning strategy to identify low performers in medical school by utilizing iRAT scores in first year CVS and Respiratory Anatomy Module.

Materials and Methods

It was a cross sectional observational study with the duration of 12 weeks. Study was conducted for students of 1st year MBBS (Session 2021) of Federal Medical College Islamabad. Whole class of One hundred and eleven students participated using nonprobability convenient sampling technique. Written consent was collected by all students before start of study.

After ethical approval of FMTI ethical review board (15th November 2021 letter number ECPIMS/02/16). Whole class was included with their consent. The Team based learning activity was introduced in 1st academic session in CVS and Respiratory modules of 6-week duration each. Six TBL activities were practiced by anatomy department during the course program which covered most of the taught anatomy content of the course. Each TBL activity was conducted as a large group discussion engaging whole class at the beginning of week 2,4,6 ,8, 10 and 12. Data was collected for 3 groups of students based on their premedical examination scores i.e., upper percentile group (A), middle percentile group (B) and lower percentile group (C). Each group comprised of 37 students. Following scores were gathered.

1. Premedical examination scores
2. Individual readiness assurance scores
3. Average i-RAT scores of 6 weeks

The premedical scores were obtained from college administration listed on basis of merit, i-RAT scores were maintained for each bi- weekly activity and documented on excel sheet and average i-RAT was calculated at the end of 12 week by calculating average of i-RAT scores obtained in six TBL activities. Validity and reliability of the test was ensured as per

institutional policy. Mean and standard deviation of first week iRAT scores and average iRAT scores in 6 TBL activities were calculated for the 3 groups as mentioned in methodology. Difference in the first week i-RAT scores of three groups was calculated using One Way ANOVA Method. Pearson correlation coefficient (r) was used to assess strength and direction of linear association between premedical examination scores and i-RAT scores. The data was analyzed in the statistical package for social sciences (SPSS) version 21 for analysis.

Result

Group A showed lowest scores in first week i-RAT (i-RAT 1) and Average i-RAT when compared with group B and C with significant p value < 0.05 indicating that the high achievers in premedical examinations struggled the most in 1st year of medical studies as briefed in table I.

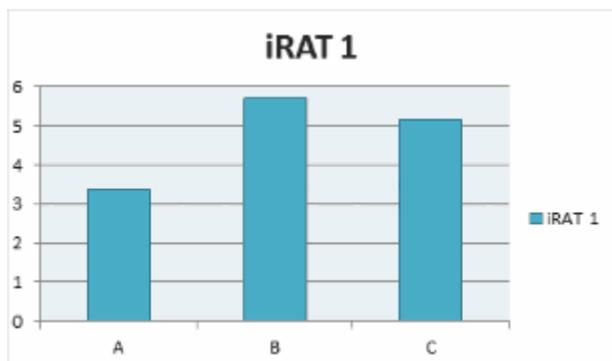


Figure 1: Comparison between i-RAT 1 and Premedical Examination Scores

Table I: Intergroup Comparison of p Values of i-RAT 1 and Average i-RAT

PARAMETER	GROUP A VS B	GROUP A VS C	GROUP B VS C
i-RAT 1 SCORES	0.00**	0.03*	0.37
AVERAGE i-RAT	0.02*	0.05	0.90

Significant increase is seen in progressive iRAT scores in all 3 groups, with maximum improvement seen in fifth and sixth week and minimum improvement is seen in upper percentile group when compared with the group B and C.

Negative linear association (r= -0.2) was found between premedical examination scores and i-RAT 1 scores of whole class with significant p value < 0.05, while very minimal negative association (r= -0.15) was found between premedical examination scores and average i-RAT with non-significant p value by using *bivariate Pearson Correlation*. *Negative*

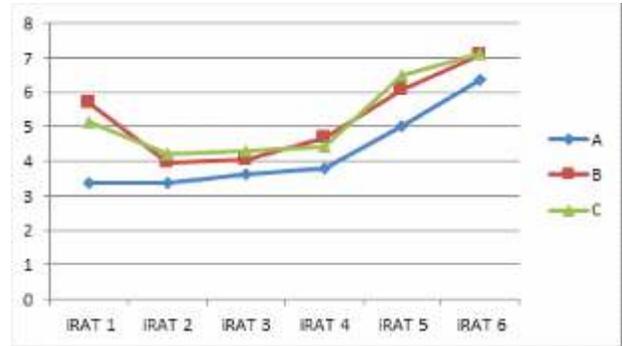


Figure 2: Progressive i-RAT Scores in 6 Weeks TBL Activities

association help fulfill the objective of identifying low performers in medical school by utilizing i-RAT scores. A strong positive linear association with Pearson coefficient r= 0.54 and significant p value of 0.01 was found between first i-RAT scores and average i-RAT scores showing persistent improvement.

Discussion

In early phase of the TBL activity i-RAT assesses students independent learning ability to learning materials shared before class¹⁵. We found that consistent improvement in weekly i-RAT in students performing in middle and lower percentile as compared to upper percentile students. Studies have documented that premedical scores are high predictors of good academic performance but contradictory evidence is also available in literature that shows no correlation between entrance test examination scores and academic performance.¹⁶ In this study we gathered scores of premedical examination and i-RAT, we identified that the upper percentile students with highest scores in premedical examinations struggled the most in their first year of medical studies as indicated by their low i-RAT scores in first week of team based learning activity.

Negative association between premedical examination scores and first week i-RAT proved that high scorers lack in performing their best on entering medical college. Literature is also in favor of our finding where the MDCAT scores are not a determinant of good performance in initial preclinical years.¹⁷

Low scores in first week activity showed that high scorers struggled in their 1st year of medical collages. This factor is documented as one of the tool to

identify students who might be at risk to suffer in initial academic years.¹⁸

Individual readiness assurance test is utilized to identify these high scorers early in their academic years to give them early support to sustain their good performance in preceding clinical years. Positive association between first week i-RAT and average i-RAT is in favor of the fact that the identified students maintain their performance and this factor can be taken as a tool to predict their future performance. To identify students who might struggle in first academic year of MBBS is only beginning to preview and stream line approaches in terms of management, policymaking, teaching and counseling, to reduce failure, encourage and foster ways for students to success in beginning years of medical studies.¹⁹

Conclusion

We concluded using i-RAT that students with high scores in premedical examination don't perform well in medical colleges.

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CONFLICT OF INTEREST

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DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon request.

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