



## CHRONOTYPE AND ACADEMIC PERFORMANCE IN LOW ACADEMIC ACHIEVERS: MORNING CHRONOTYPES PERFORM BETTER THAN EVENING CHRONOTYPES IN MBBS PHASE 1 STUDENTS

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### ABSTRACT

**Introduction:** Cognitive performance and academic outcomes are heavily influenced by chronotype—individual preferences for sleep and activity timing. Medical students with evening chronotypes often clash with early morning academic schedules, potentially worsening performance, especially among low-achieving students. In MBBS Phase 1, examination performance in low-achieving students varies significantly with chronotype. **Methodology:** Studies using the Morningness–Eveningness Questionnaire (MEQ) were reviewed to assess chronotype and compare exam performance in underachieving students. Chronotypes were grouped into three categories: morning types (MEQ > 59), evening types (MEQ < 41), and intermediates. Students scoring below 50% were evaluated in core medical subjects using internal assessment scores. **Results:** Morning chronotypes significantly outperformed evening chronotypes in both written and practical exams. In one study, morning types averaged 59.2%, while evening types scored just 45.1%, a notable difference. Morning types showed better sleep habits, consistent attendance, and greater alertness during morning exams. Evening types, by contrast, experienced poor sleep patterns, elevated pre-exam anxiety, and concentration issues, especially during stressful periods. **Conclusion:** Chronotype substantially affects academic performance, particularly among low-achieving MBBS Phase 1 students. Morning types benefit from alignment with standard academic schedules, while evening types struggle within such rigid structures. These chronotype differences can inform interventions to support struggling students. Overall, low-achieving morning chronotypes performed significantly better than evening types based on MEQ scores in MBBS Phase 1 exams.

### KEYWORDS :

#### INTRODUCTION

Chronotype, or whether someone is a morning or evening person, significantly affects learning, cognitive performance, and academic success. It's measured using the MEQ and categorized into morning, intermediate, and evening types. Morning types tend to be more alert early in the day, while evening types often struggle during morning hours.<sup>1</sup> In MBBS Phase 1, academic schedules are morning-heavy, making it harder for evening types to perform well—especially low achievers. Research shows that morning chronotypes consistently outperform evening types in internal assessments, suggesting that aligning academic demands with biological rhythms can be crucial for struggling students' academic outcomes.<sup>2-5</sup>

#### MATERIALS AND METHODS

**Source of Data:** The slow learners (low academic achievers) of phase 1 MBBS Studying at KAHER'S JNMC (2023-24) who scored less than 40% in their first Internal Assessment exams in the subject of Physiology will be enrolled for this study.

**Study Design:** A Cross sectional study

**Study Area:** KLE's Jawaharlal Nehru Medical College Belagavi in Neurophysiology lab, Dept of Physiology, JNMC

**Sample Size:** Following the first internal assessment students who attain < 40 % scores in Physiology theory will be categorized as Low academic achiever and enrolled into the study unless they volunteer notto.

#### Inclusion Criteria

- Age group 18-20 years
- A phase 1 MBBS student who has scored below 40% in the first internal assessment exams

#### Exclusion Criteria

- Students scoring more than 40% marks / advanced learners
- History of habits of smoking, alcohol, caffeine consumption, drug intake, etc.
- Students with any illness fever or on drug treatment were excluded from the study.

#### Ethical Clearance:

The present research project was approved by JNMC Institutional Ethics committee on human subjects research ( MDC/JNMCIEC/ 149).

#### Methodology

Primary research studies assessing chronotypes via MEQ were compared with academic outcomes of low-performing MBBS Phase 1 students rather thoroughly. Chronotype categories got defined via

MEQ scoring as morning type exceeding 59 intermediate type ranging 42–58 and evening type falling below 41. Academic performance in subjects like anatomy and physiology got determined by internal exam scores. Students were slotted into categories based loosely on their MEQ scores apparently. Biochemistry scores contributed heavily to assessment of academic performance somehow. Low academic achievers scored below fifty percent overall in internal exams or university assessments generally. Referenced studies conducted t-tests within this subgroup to analyze morning and evening types based on sample size and data distribution. Data on sleep quality and alertness levels were considered alongside class attendance figures where available better understanding impact of chronotype on cognitive readiness.<sup>6-9</sup>

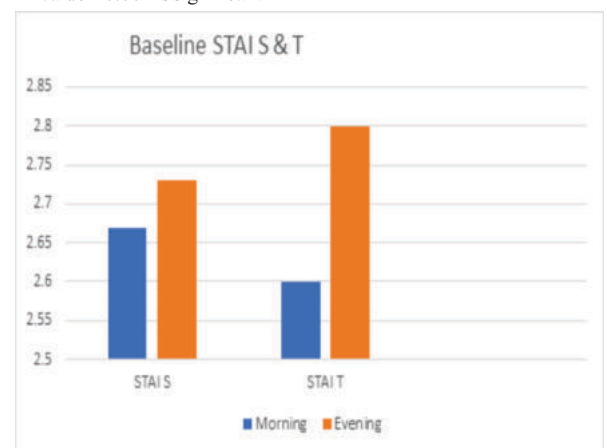
#### RESULTS

**Table No 1: Comparison of STAI S & T Among Baseline Morning and Evening Chronotype**

Stimuli	Chronotype		T	p value
	Morning	Evening		
STAI S	2.67±0.72	2.73±0.96	-0.215	0.416
STAI T	2.60±0.91	2.80±0.94	-0.592	0.279

This study found that morning and evening people have similar anxiety levels when things are calm, with no significant difference in their state and trait anxiety scores.

\*P value < 0.001 is significant

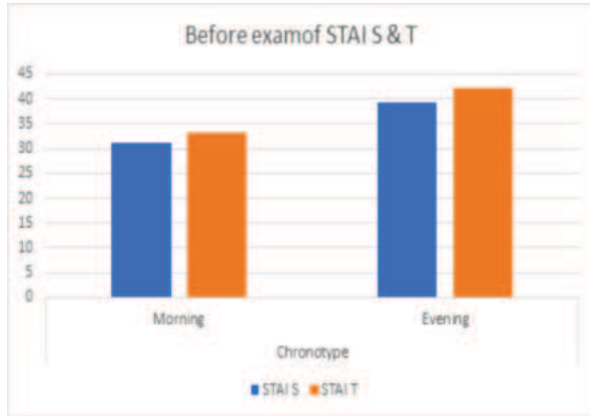


**Table No:2 Comparison of STAI S& T Among Before Exam Morning and Evening Chronotype**

Stimuli	Chronotype		T	p value
	Morning	Evening		
STAI S	31.1±1.9	39.4±2.3	-9.05	<0.001*
STAI T	33.3±2.0	42.1±1.9	-13.16	<0.001*

Before an exam, a stressful situation, evening types showed notably higher anxiety levels than morning types, with significant differences in both state and trait anxiety scores.

\*P value < 0.001 is significant



Morning chronotypes in low academic achiever groups significantly outperformed evening chronotypes in most studies with fairly consistent results being reported. Thirty students were deemed low performers in an institutional study among two hundred MBBS Phase 1 students somehow rather quietly. Sixteen participants were deemed morning types and fourteen were deemed evening types based on scores obtained from MEQ. Morning types achieved significantly better average exam scores than students who scored well as evening types with a p value less than 0.01.<sup>3</sup>

Morning chronotypes exhibited remarkably stable sleep schedules and unusually heightened subjective alertness during morning hours notably. Evening types frequently reported considerable difficulty waking up and exhibited poor concentration during morning classes with greater anxiety before examinations.<sup>7,9,10</sup> Neurocognitive data revealed evening types exhibited delayed sleep onset and impaired working memory during assessments conducted rather early in the day.<sup>11</sup>

## DISCUSSION

Chronotype significantly influences academic performance of medical students particularly among low achievers in various educational settings rather quietly. Students having evening chronotypes face considerable disadvantage owing largely to mismatch between peak biological performance times and rigid early morning schedules. Circadian misalignment dubbed social jetlag precipitates woeful sleep quality and diminished morning alertness alongside crippled cognitive function particularly in tasks demanding keen attention and memory.<sup>12-14</sup>

Low academic achievers frequently flounder with motivation and subpar learning strategies underneath adverse circumstances somehow. Challenges escalate significantly for folks sporting evening chronotypes. Morning chronotypes revel in a sweet spot where cognitive peak and exam timing converge naturally enabling stellar academic performance.<sup>3,5,6</sup>

MBBS students often suffer mental fatigue and poor academic outcomes due largely to irregular sleep patterns and lack of sleep. Studies reveal a mere sixty minutes of desynchrony between internal biological clocks and school timetables significantly impairs cognition in mentally demanding disciplines.<sup>11,13,15</sup> Chronotype is not just some innate biological trait but a potentially modifiable risk factor for underachieving students struggling academically.

## CONCLUSION

Morning chronotypes identified by high MEQ scores perform markedly better in examinations than evening chronotypes among low achievers in MBBS Phase 1. Better synchronization between biological rhythm and academic demands alongside superior sleep quality fosters enhanced morning cognitive readiness remarkably well

nowadays. Chronotype-based academic interventions seem warranted given findings that highlight a pressing need for tailored educational strategies. Educators oughta think about giving students with knack for staying up late flexible timetables and sleep hygiene seminars and bespoke scholastic backing. Institutions can promote markedly better outcomes especially for academically struggling students by leveraging insights gleaned from chronobiology in educational settings.

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