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Sex-based variations in physical characteristics and their association with morningness–eveningness patterns

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Abstract: The study aimed to examine sex differences in anthropometric variables and their relation with chronotype among twenty-one students of Zoology of Raghunathpur College using the Morningness–Eveningness Questionnaire (MEQ). The majority of participants (10) were classified as moderately morning type, while nine were neither type and only one participant each belonged to definitely morning and moderately evening types. Two-tailed Welch's t-tests indicated significant sex-based differences in height, weight and body mass index (BMI), with males showed higher mean values than females ($p < 0.05$). There was no significant difference between MEQ scores of males and females ($p = 0.9479$), suggesting that chronotype distributions were alike. Tukey post-hoc analyses confirm these results. The analysis of covariance (ANCOVA) analysis showed that BMI and age are not predictor of MEQ score in both sexes. Principal Component Analysis (PCA) indicated that the first principal component was associated predominantly with body size variables (weight, BMI and height), whereas the second principal component reflected an inverse association between age and chronotype. The results point out evident sex differences in physical characteristics, but indicate that chronotype does not depend on anthropometric variables.

Key-words: Body mass index (BMI), Chronotype, Morningness–Eveningness Questionnaire (MEQ), Principal Component Analysis

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1. Introduction

Circadian rhythm is a natural cycle of 24 hours at the level of cell, organ, or organism that governs many normal physiology, behavior and psychology in humans. It regulates sleep–wake cycles, hormone release,