

Research Paper

Influence of Chronotype on Subjective Well-Being among High School Minority Students of Seemanchal Region of Bihar

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ABSTRACT

Subjective well-being (SWB) is important for students to improve their academic performance, resilience, and overall development. Subjective well-being represents individuals' cognitive evaluation of life satisfaction and their experience of positive and negative emotions. Chronotype, or biological rhythm preference, has emerged as a crucial determinant of emotional functioning during adolescence—a developmental period manifest by significant biological and psychosocial changes. The present study examines the relationship and predictive role of chronotype in shaping life satisfaction, positive affect, and negative affect among high school minority students. The findings reveal that chronotype is significantly associated with all dimensions of subjective well-being. More adaptive chronotype patterns are linked with high level of life satisfaction and positive affect, as well as low level of negative affect. Regression analyses further demonstrate that chronotype significantly predicts each component of subjective well-being, with a particularly strong influence on emotional experiences. These results highlight chronotype as an important contributor to adolescent well-being in educational contexts.

Keywords: *Subjective Well-being, chronotype, life satisfaction, positive affect*

Students enrolled in secondary and senior secondary schools are typically in the stage of adolescence, which is often described as a transitional phase of development. During this period, subjective well-being plays a crucial role, as it is a significant predictor of future happiness, physical health, interpersonal relationships, and academic success. Positive levels of subjective well-being contribute to the foundation of healthy adulthood by strengthening psychological resilience, lowering the risk of substance use, and enhancing overall life satisfaction (Wu & Lee, 2022; Xu et al., 2025).

Subjective well-being (SWB) is widely understood as a multidimensional construct encompassing both cognitive evaluations of life satisfaction and the balance between positive and negative emotional experiences (Diener, 1984; Diener et al., 1999). Adolescence is marked by rapid biological changes, increasing academic pressures, and evolving social relationships, all of which interact to shape emotional and psychological health (Crowley et al., 2007). For students from minority groups, these developmental

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challenges may be further intensified by additional social, cultural, and environmental stressors.

Chronotype states to individual differences in preferred sleep–wake timing and daily activity patterns (Adan et al., 2012). Empirical evidence suggests that circadian preferences significantly influence emotional regulation, alertness, and psychological adjustment, particularly during adolescence (Wittmann et al., 2006). Traditional Indian knowledge systems also highlight the importance of sleep for maintaining mental and physical balance. In Ayurvedic philosophy, *Nidra* (sleep) is regarded as one of the three fundamental pillars of life and is considered essential for emotional stability and cognitive efficiency (Prajapati & Paliwal, 2019). Classical Ayurvedic texts emphasize early sleeping and waking habits for students, linking regular sleep–wake cycles with improved concentration, intellectual functioning, and overall well-being.

From a biological perspective, adolescence involves a natural shift toward later sleep–wake rhythms, which often conflicts with early school schedules. This mismatch leads to circadian misalignment, commonly referred to as “social jetlag” (Wittmann et al., 2006). Such mismatch has been correlated with mood disturbances, emotional dysregulation, and reduced subjective well-being (Crowley et al., 2007). Therefore, examining the role of chronotype in subjective well-being is essential for promoting mental health and adaptive functioning among adolescents within school settings.

Objectives

1. To ascertain the relationship between chronotype and dimensions of subjective well-being among high school minority students.
2. To assess the predictive effect of chronotype on life satisfaction, positive affect, and negative affect.

METHODS

Sample

This study was undertaken on 324 secondary and senior school students of minority class studying in Purnea town. Their mean age was 16.44 ranging between 14 to 22 years. Sample comprising of 108 boys and 216 girls’ students.

Measures

1. **Life Satisfaction Scale:** The life satisfaction scale was advanced by Diener et al. (1985) to measure the level of life satisfaction. The present scale is a short version of a life satisfaction scale which comprises 5 items. The main objective of this scale is to measure universal cognitive aspects of life satisfaction.
2. **Positive and Negative Affect Scale (PANAS):** The “Positive and Negative Affect scale” was developed by Diener et al. (2010). The positive and negative experience scale is also known as SPANE. It is a 12-item scale measure six positive feelings and six negative feelings.
3. **Morning-evening Chronotype Scale:** The Morning-Evening Scale is an important chronotype scale which is globally accepted. This scale was advanced by Adan et al. (2012) consists of 5 items only. High scores on this scale are indicative of a morning-type of person and on the other hand, a low score is telling of an evening-type of personality.

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RESULTS

Correlation analysis showed that chronotype is associated with all dimensions of subjective well-being. Chronotype has a positive relationship with life satisfaction. Students with more adaptive biological rhythms think more positively about their lives. This finding suggests that circadian alignment affects how adolescents judge their quality of life. Chronotype also demonstrates a moderate but significant positive correlation with positive affect. It indicates that students whose daily rhythms are better synchronized experience higher levels of pleasant emotions such as enthusiasm, happiness, and energy. This result highlights the emotional benefits of circadian harmony during adolescence.

In contrast, chronotype exhibits a significant negative association with negative affect. It revealed that students with healthier rhythm patterns experience fewer unpleasant emotions such as anxiety, sadness, and irritability. These findings are consistent with earlier evidence linking circadian alignment with better emotional regulation and psychological adjustment (Wittmann et al., 2006).

Table-1 Correlation between Chronotype and Dimensions of Subjective Well-being of High School Minority Students

	Life Satisfaction	Positive Affect	Negative Affect	Chronotype
Life Satisfaction	1	.666**	-.756**	.188**
Positive Affect	.666**	1	-.744**	.346**
Negative Affect	-.756**	-.744**	1	-.367**

Predictive Effect of Chronotype on Subjective Well-Being

Regression analyses establish chronotype as a substantial predictor of subjective well-being. Chronotype significantly predicts life satisfaction, indicating that biological rhythm preference contributes to adolescents' cognitive evaluations of their lives (Diener, 1984). The strongest predictive effect is observed for positive affect, suggesting circadian alignment plays a central role in enhancing positive emotional experiences (Adan et al., 2012).

Moreover, chronotype significantly predicts negative affect in an inverse direction. It demonstrates that favourable chronotype orientations help reduce emotional distress. This protective role of chronotype aligns with previous findings on the adverse emotional consequences of circadian misalignment during adolescence (Crowley et al., 2007; Wittmann et al., 2006).

Table-2 Predicting the Effect of the Chronotype on the Dimensions of Subjective Well-being of High School Minority Students

Predictor	Dep. Variable	R	R Square	F	B	T	Sig.
Chronotype	Life Satisfaction	.188	.035	11.828, P<.001	.153	.045	.001
	Positive Affect	.346	.119	43.686, p<.000	.385	6.610	.000
	Negative Affect	.367	.135	50.154, p<.000	-.263	7.082	.000

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The strongest predictive effect of chronotype is observed for positive affect. It suggests that circadian alignment plays a particularly important role in enhancing adolescents' positive emotional experiences. Students with favourable chronotype patterns report higher levels of positive emotions, reflecting better emotional vitality and engagement.

Chronotype also significantly predicts negative affect in an inverse direction, demonstrating that adaptive biological rhythms help reduce emotional distress. This finding suggests that chronotype not only enhances positive emotional states but also serves a protective function by minimizing negative emotional experiences. Results clearly demonstrate that chronotype is not only correlated with subjective well-being but actively contributes to both its cognitive and emotional dimensions.

DISCUSSION

The findings of the current study emphasize chronotype as a significant determinant of subjective well-being among high school minority students. Students with more adaptive circadian preferences consistently report higher life satisfaction and greater positive affect, along with lower negative affect (Kumar & Kumari, 2023).

For minority students, who may already experience heightened academic and social pressures, misalignment between biological rhythms and school schedules may further exacerbate emotional strain. Conversely, better alignment appears to support emotional balance and resilience. These results are consistent with earlier research highlighting the adverse effects of circadian disruption and social jetlag during adolescence. The results support existing chronobiological research emphasizing the role of circadian alignment in emotional health and well-being (Adan et al., 2012; Wittmann et al., 2006).

CONCLUSION

The present study provides compelling evidence that chronotype plays a significant role in shaping subjective well-being among high school minority students. Chronotype positively predicts life satisfaction and positive affect while significantly reducing negative affect. These findings throw light on the importance of incorporating biological rhythm considerations into educational planning and mental health interventions aimed at promoting adolescent well-being.

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Conflict of Interest

The author(s) declared no conflict of interest.

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