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Relationship between Physical Activity, Objective Sleep Parameters and Circadian Rhythm in Patients with Head and Neck Cancer receiving Chemoradiotherapy- A Longitudinal Study

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Objectives- This study was developed to assess the relationship between physical activity, sleep and circadian rhythm using accelerometer and urine melatonin levels in patients with Head and Neck Cancer (HNC). Also, this study evaluated the changes in physical activity, sleep and circadian rhythm during the seven-week course of chemoradiotherapy. Methods- This Longitudinal study recruited 27 participants diagnosed with HNC who were planned to undergo chemoradiotherapy. Accelerometers worn for 3 days during the first, third and seventh week of chemoradiotherapy were used to assess physical activity levels (step count and METs) and sleep quality (total sleep time (TST), sleep onset latency (SOL) and sleep efficiency (SE)). Urine melatonin analysis was conducted using the morning void urine sample on first, third and seventh week. The change of variables during the seven weeks and the correlation between them were analyzed. Results- During the seven weeks, trends of reduction in variables of physical activity, sleep and circadian rhythm were observed with significant decrease in step count, TST and melatonin levels. SE was found to have strong negative correlation with physical activity. TST was found to have moderate correlation with SE and step count. The variables of physical activity also showed moderate correlation between them. Conclusion- This study concludes that higher physical activity is associated with poor SE due to increased night-time activity. There was a significant reduction in physical activity and sleep observed during seven weeks with moderate association between them. The significant circadian rhythm deregulation however showed poor association with the other variables