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Abstract

Seasonal variations in physical activity, sleep patterns, and depressive symptoms in older adults living alone in a rural area

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Physical Activity (PA) and human mental health seem to be influenced by seasons (Arnardottir et al., 2017; Martinez, 2018). However, little is known about how these parameters vary in elderlies living alone in rural areas, especially those in social isolation (SI). Moreover, it is still unclear how seasonality influences sleep patterns in this population. This study explores seasonal variations in PA, depressive symptoms, and sleep patterns among older adults living alone in a rural area. Fifty-nine participants (80.07±6.31 years) who lived alone in rural areas of Vila Real were included. Sociodemographic data and Lubben Social Network Scale-6 (LSNS-6), were assessed. PA and sleep patterns were measured using a GT9X accelerometer, and depressive symptoms were assessed through the Geriatric Depression Scale (GDS). Sleep parameters included the clock time of in-bed time and get-up time, total minutes spent in bed,

total sleep time (TST), wake after sleep onset (WASO), and total counts. Seasonal variations were analysed by considering weather factors, including average temperature, precipitation levels, daylight duration, sunset time, and sunrise time. In summer, participants engaged in significantly higher levels of light physical activity (t =-2.15, p=0.04), moderate-vigorous physical activity (t=4.17, p=0.00), and daily steps (t=2.78, p=0.00). In contrast, winter was associated with more sedentary behaviour (t=-2.56, p=0.01). Depressive symptoms were found to be lower during the summer (t=0.99, p=0.00), while a significant correlation was observed between depression symptoms and winter precipitation (rho=0.34). On the other hand, SI was lower in the summer, showing a correlation with the longer period of daylight (rho=-0.39), sunrise time (rho=-0.44), and sunset time (rho=0.39). The sleep patterns indicated that during winter, these older adults went to bed earlier (t=-6.49, p=0.00) and got up later (t=2.02, p=0.04), had more total minutes in bed (t=-6.69, p=0.00), and exhibited longer TST (t=-7.41, p=0.00). During winter, sleep increased (p=0.02), and the temperature was correlated with total minutes in bed (rho=0.32), TST (rho=0.30), and bedtime (rho=-0.33). However, during winter, sunrise and sunset time correlated with WASO (rho=-0.33, rho=0.33, respectively), and total counts (rho=-0.32, rho=0.32, respectively). In conclusion, this study highlights the influence of seasonal variations, including weather factors, on physical activity, depressive symptoms, and sleep patterns in older adults living alone in rural areas. The findings emphasise the importance of considering these seasonal dynamics in designing tailored interventions to promote physical activity, improve mental well-being, and enhance sleep quality in this vulnerable population.

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