



## Practice Parameters For The Use Of Actigraphy In Sleep Disorders: A Systemic Review

**Dr. KalaBarathi.S\*1, Aarthi.M, Abarna.M, Abinaya.M**

Principal, Department of Obstetrics and Gynecological Nursing, Saveetha College of Nursing,  
SIMATS, Chennai – 602105

B.Sc (Nursing) Final Year, Saveetha College of Nursing, SIMATS, Chennai – 602105

**\*Corresponding Author:**

**Dr. KalaBarathi. S**

Principal, Department of Obstetrics and Gynecological Nursing, Saveetha College of Nursing,  
SIMATS, Chennai – 602105

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

### Abstract

The outbreak of COVID - 19 in 2019 rapidly escalated into a worldwide pandemic affecting countries round the world, which imposed social isolation measures to prevent the spread of the disease. In this study, we aimed to determine the practice parameters for the use of actigraphy among people. We did a systematic review and network Meta - analysis from PubMed & Google scholar. We extracted data following a predefined hierarchy in these studies. We assessed practice parameters for the use of actigraphy in sleep disorders among people. According to the 10 studies we identified, involving 1000 population shows that a significant interaction indicated that the Actigraph had a more beneficial effect on those with more somatic symptoms at baseline but not those with more sleep problems. Athletes showed poorer markers of sleep quality than an age and sex matched non athletic control group. Out of the 108 studies reviewed for this project, 44 used sleep logs alone as a reference standard, 16 used Polysomnography alone, and 10 used both sleep logs and Polysomnography with which actigraphic ratings could be objectively compared. Thirty eight studies did not compare actigraphy to a reference standard. Default actigraphy methods are not the most accurate methods for Characterizing operational sleep patterns is a necessary first step in developing strategies to improve soldier readiness.

**Keywords:** NIL

### Introduction

The occurrence of COVID-19 in December 2019 speedily escalated into a worldwide pandemic moving countries around the world, that obligatory social isolation measures to stop the unfold of the disease[1]. Among the results of quarantine, there are acute stress disorders, anxiety, irritability, poor concentration and indecisiveness, deteriorating work performance, post-traumatic stress disorders, high psychological distress, depressive symptoms and insomnia [2]. Before the pandemic, discussions on the longer term of work-life were cloudy and infrequently questioned. COVID-19 implemented a call upon folks, and with the planet having to rework quickly, several businesses opted to undertake Work from home [3]. Increased social media revelation was

recognized as an attainable relies on worsening mood disorder symptoms [4]. The operating setting has been significantly modified with thousands of jobs lost and women wedged at higher rates than men. For those utilized in sections able to work remotely, in the main professional skilled employees, their homes have currently return to be geographical point, school, and place for relaxation. As economies begin to open up with start of some traditional activities, queries arise regarding the potential come to formal workplace environments and so the intimation for employees while COVID-19 remains active within the community[5].Sleep issues like nap length and sleep disorder are risk factors for psychological state issues and impaired psychological feature functioning. Moreover, the negative effects of sleep

issues are also worsen in bad occupations with magnified incidence of psychological state issues. One attainable due to improve sleep is through magnified awareness, and a way to boost awareness is through actigraphy. Wrist-worn actigraphy live movement acceleration from that sleep/wake temporal order and length are calculable. These devices are valid against polysomnography in each traditional sleepers and adults with insomnia[6] Actigraphy as a technology is used principally among the developed markets of North America and Europe. This ultimately relates to use of actigraph for clinical studies in North America at sixty three followed by Europe at twenty second. Asia remains fall back in terms of usage of such technology throughout a test conduct[7] Actigraphy may even be a way that records and mix the incidence and degree of limb movement activity over time. Actigraphic devices are typically commonly worn on the articulation plana, mortise joint or waist, comparatively restrained over an amount of days to weeks. For sleep applications, the devices are commonly worn on the articulation plana or mortise joint. Mathematical algorithms are then applied to that information to estimate wakefulness and sleep. Moreover, to providing a graphical outline of wakefulness and sleep patterns over time, actigraphy generates an approximate of sure sleep parameters that are ordinarily calculable by exploitation sleep logs, or measured directly by polysomnography (PSG), the gold level live of sleep [8]. Actigraphy is found on the watching of movements throughout sleep or activity for long periods of some time and, attributable to the employment of specific laptop algorithms, little devices can offer data relating to individual sleep patterns. several soft- ware applications are able to record, analyze and score physical activity and, in turn, infer sleep/wake characteristics which enable to diagnose and even forestall sleep-related disease[9]. The purpose of this guideline is to see clinical apply recommendations for the employment of actigraphy in adult and pediatric patients with suspected or diagnosed sleep disorders or time sleep-wake disorders. Based on it task force's report, the AASM Standards of apply Committee over that actigraphy wasn't indicated for routine diagnosing or for assessment of severity or management of sleep disorders, but may well be a helpful adjunct for diagnosis sleep disorder, biological time disorders or

excessive temporary state. Since that point, actigraph technology has improved, and plenty of a lot of studies are conducted. Many review papers have over that articulation plana actigraphy will usefully approximate sleep versus wake state throughout twenty four hours and have noted that actigraphy has been used for watching sleep disorder, unit of time sleep/wake disturbances, and periodic limb movement disorder [10]

## Methods

We did a systematic review and network meta-analysis. We searched PubMed, Google Scholar for accurate data. In this study we included all the descriptive studies, meta-analysis, experimental study and statistical analysis studies which deal with use of actigraphy in sleep disorders. We extracted data following a predefined hierarchy. In these studies, we assessed the practice parameters for the use of actigraphy in sleep disorders among people. Studies have involved adults and children. All included studies must have practice parameters for the use of actigraphy in sleep disorders. Data extracted were calculating the sensitivity, specificity, and predictive values, and by ROC curve analyses. To practice parameters for the use of actigraphy in sleep disorders among people. The scores from each assessor were cross-checked.

## Results

In this meta-analysis, according to 10 studies involving 1000 individuals, this is the systematic review on practice parameters for the use of actigraphy in sleep disorders among people. All studies recorded more than one outcome measure at baseline and after intervention. A range of outcome measures were used to sensitivity, specificity, and predictive values, and by ROC curve analyses.

According to **Juan Piantino, Madison luther (2021)** conducted an Emfit bed sensor activity that shows strong agreement with wrist actigraphy for the assessment of sleep in home setting: this study conducted a cross sectional. Sleep data was captured for 14 days. Based on previous work on the agreement between actigraphy and sleep diaries, the purpose of this study compared sleep- wake measurements between this sensor and a validated actigraphy. The study was conducted on thirty healthy subjects (6 to 54 years) underwent

simultaneous monitoring with both devices for 14 days and filled out a daily sleep diary. The study concluded that the inter class correlations coefficients revealed an excellent agreement for all sleep parameters except for WASO sensitivity, specificity, and accuracy, respectively. The correlation analysis revealed a moderate correlation between the two devices. This review provided moderate evidence to support the fact that virtual reality training. Further research is required to investigate the optimum training intensity and frequency to achieve the desired outcome.

According to **Jacopo A. Vitale, Francesco Negrini (2019)** conducted a study on actigraphy based sleep parameters and rest activity circadian rhythm in a young scoliotic patient: a systemic review and Meta – analysis. In this study is a case study with a prospective observational design. Aimed to investigate the existence of RAR and to study actigraphy based sleep behaviours in a 14 years old male patient affected by severe idiopathic scoliosis and treated with a rigid brace 23 hours per day. The sleep parameters were studied through actigraphy for seven consecutive days in July 2018. The study concluded that the conservative treatment of scoliosis did not negatively affect the RAR and sleep and behaviours of the patient. This study suggests that the actigraphy based sleep parameters to assess sleep.

### Conclusion

The study concludes that this review provided moderate evidence in the usage of actigraphy in sleep disorders. Actigraphy was used only by minimum number of people as per the literature review. The tool actigraphy gives accurate findings in assessing sleep disorders.

### Acknowledgments

We would like to extend our gratitude to the authorities of Saveetha College of Nursing and Saveetha Medical College Hospital for this study.

### Reference:

1. Yuksel, D., McKee, G. B., Perrin, P. B., Alzueta, E., Caffarra, S., Ramos-Usuga, D., Arango-Lasprilla, J. C., & Baker, F. C. (2021). Sleeping when the world locks down: Correlates of sleep health during the COVID-19 pandemic across 59 countries. *Sleep health*, 7(2), 134–142. <https://doi.org/10.1016/j.sleh.2020.12.008>
2. Gualano, M. R., Lo Moro, G., Voglino, G., Bert, F., & Siliquini, R. (2020). Effects of Covid-19 Lockdown on Mental Health and Sleep Disturbances in Italy. *International journal of environmental research and public health*, 17(13), 4779. <https://doi.org/10.3390/ijerph17134779>
3. Lina Vyas & Nantapong Butakhieo (2021) The impact of working from home during COVID-19 on work and life domains: an exploratory study on Hong Kong, *Policy Design and Practice*, 4:1, 59-76, DOI: 10.1080/25741292.2020.1863560
4. Conroy DA, Hadler NL, Cho E, et al. The effects of COVID-19 stay-at-home order on sleep, health, and working patterns: a survey study of US health workers. *J Clin Sleep Med*. 2021;17(2):185–191.
5. Adler, A. B., Gunia, B. C., Bliese, P. D., Kim, P. Y., & LoPresti, M. L. (2017). Using actigraphy feedback to improve sleep in soldiers: an exploratory trial. *Sleep Health*, 3(2), 126-131.
6. Bellone, G. J., Plano, S. A., Cardinali, D. P., Chada, D. P., Vigo, D. E., & Golombek, D. A. (2016). Comparative analysis of actigraphy performance in healthy young subjects. *Sleep science (Sao Paulo, Brazil)*, 9(4), 272–279. <https://doi.org/10.1016/j.slsci.2016.05.004>
7. Smith, M. T., McCrae, C. S., Cheung, J., Martin, J. L., Harrod, C. G., Heald, J. L., & Carden, K. A. (2018). Use of actigraphy for the evaluation of sleep disorders and circadian rhythm sleep-wake disorders: an American Academy of Sleep Medicine clinical practice guideline. *Journal of Clinical Sleep Medicine*, 14(7), 1231-1237.
8. Ancoli-Israel S, Cole R, Alessi C et al. The role of actigraphy in the study of sleep and circadian rhythms. *American Academy of Sleep Medicine. Review Paper. SLEEP* 2003;26(3):342-92
9. Ilancheran, M., & Zammit, G. K. (2016). Impact of actigraphy in clinical research []. *Applied Clinical Trials*.
10. Oakman, J., Kinsman, N., Stuckey, R., Graham, M., & Weale, V. (2020). A rapid review of mental and physical health effects of working at home: how do we optimise health? *BMC Public Health*, 20(1), 1-13.

