

## Documents

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**The prediction of sleep quality using wearable-assisted smart health monitoring systems based on statistical data (2023)** *Journal of King Saud University - Science*, 35 (9), art. no. 102927, .

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### Abstract

The technology, which plays a significant role in our lives, has made it possible for many of the appliances and gadgets we use on a daily basis to be monitored and controlled remotely. Health and fitness data is collected by wearable devices attached to patients' bodies. A number of parties could benefit from this technology, including doctors, insurers, and health providers. This technology, including smartwatches, smart ring, smart cloth wristbands, and GPS shoes, is frequently used for fitness and wellness since it allows users to track their day-to-day health. Devices that compute the sleep characteristics by storing sleep movements fall within the category of wearables worn on the wrist. In order to lead a healthy lifestyle, sleep is crucial. Inadequate sleep can harm one's physical, mental, and emotional well-being and increase the risk of developing a number of ailments, including stress, heart disease, high blood pressure, insulin resistance, and other conditions. Deep learning (DL) models have recently been used to forecast sleep-quality based on wearables information from the awake hours. Deep learning has been demonstrated to be capable of predicting sleep efficiency based on wearable data obtained during awake periods. In this regard, this study creates a novel deep learning model for wearables-enabled smart health monitoring system (DLM-WESHMS) for the prediction of sleep quality. The wearables are initially able to collect data linked to sleep-activity using the described DLM-WESHMS approach. The data is then put through pre-processing to create a standard format. Using the DLM-WESHMS, sleep quality is predicted using the deep belief network (DBN) model. The DBN model uses the auto-encoders algorithm (AEA) to predict popularity, which improves the accuracy of its predictions of sleep quality. The experimental outcomes of the DLM-WESHMS approach are investigated using several metrics. The DLM-WESHMS model performs significantly better than other models, according to a thorough comparison analysis. © 2023 The Author(s)

### Author Keywords

Deep learning; Healthcare; Sleep-quality prediction; Wearables

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