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Design of Smart Pillow for Improvement in Sleep Quality

Robin Jaiswal[1], Kajal Kumari[2], Pramod Kumar[3]
UG Students, Department of Mechanical Engineering [1,2]
Associate Professor, Department of Mechanical Engineering[3]
Vivekananda Global University, Jaipur, India

Abstract: *The design of smart pillow is used for improve the sleep quality. For a human proper sleep is necessary. The pillow is design to detect and respond to snoring. The technology which is help us to development of the smart pillow. Smart pillow is connected with a sensor to track the temperature, stress level and sleeping posture. The pillow can consider non-physiological factors like sleeping hours, snoring range, sleeping posture. In this smart pillow, the memory foam is also used in it that helps to adjust the shape of our head and neck. The whole data will be accessed via mobile apps. The stress level is increase day by day. Smart pillow helps in peaceful and deep sleep.*

Keywords: Smart Pillow, Memory Foam, Sleep Quality, Sleeping Posture

I. INTRODUCTION

The smart pillow is indicated when the sleeper snores while sleeping. The pillow monitors the level of snoring during sleeping. The need of smart pillow is for good and healthy sleep. Smart pillow contributes for creating an optimal sleep environment factors like room temperature, better sleep quality and body health [1]. The design of the smart pillow detects the sound during sleeping and alert the sleeper. The smart pillow is automatically enabling when the sleeper puts his/her head on the pillow [2]. Snoring is an unfortunate condition because it create a sound which disturb the whole people who are sleeping around him. When a sleeper will change their sleeping position, they are more likely to settle into different position that will prevent snoring. The product is designed for those interested in improving their sleep quality. The smart pillow that is connected through a sensor, these sensors track your movements, sleep quality, sleeping duration and sleep patterns. Mental Stress is a big problem in this society which can affect the people and create the problem during sleeping time. Stress has become the main reason which causing the health issue. Stress is harmful which can cause long term harm diseases. Stress increases the risk of heart diseases, heart attack diseases and stroke. A little stress is necessary for us but too much stress is not good for human health. Sleep can be defining the naturally for a human maximum 8 hours is enough for sleeping. Improper sleep can cause the mental stress and health issue.

II. LITERATURE REVIEW AND METHODOLOGY

The concept of a design of electric smart pillow is an innovative idea approach to improve in sleep quality. The pillow is good for stress reduction and sleep quality improvement. The smart pillow can help in reduce stress level during sleep. This pillow can monitor physiological and non-physiological factor during sleep such as Temperature, snoring range, sleeping posture. The smart pillow is designed to provide proper and healthy sleep. The electric smart pillow can stop snoring and improve sleep quality. This pillow will design to detect and respond to snoring. When the person will snore during sleeping time then the pillow will put the neck toward in upward direction. The memory is made with soft memory foam it adjusts to the shape of your head and neck. This pillow is connected with the app and track their sleeping patterns. Designing a solar-powered car with artificial intelligence (AI) entails combining multiple technologies to maximize energy economy, safety, and overall performance. In this article, in this paper covers the main phases necessary in developing such a vehicle. Sleep is one of the main human needs. It is responsible for physical and energy restoration, memory processing, learning and brain development and so on. [2]. The IoT is an extensive open network of smart devices with ability to share resources, data, self-organize, to act and react to changes

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in the dynamic environment. It is a novel computing and telecommunications technology arose from Radio Frequency Identification (RFID) and Wireless Sensor Networking (WSN) meeting [3].The rapid growth of IoT allied with others technologies like Cloud Computation, Big Data and the reach of portable devices are changing the relationship between patients and health providers [4]. COVID-19 pandemic accelerated the needs for ubiquitous health, telemedicine, remote patient monitoring and wearable devices [5]..

III. MATERIAL AND METHODS

The materials and methods section for the "Design of Smart Pillow for Improved Sleep Quality" would detail the components and tools used in creating the smart pillow. The pillow made up with soft memory foam. The advantage of this foam is automatically come in original shape. The airbags are used for made the pillow [4]. The pillow which is used in our home is not a proper pillow. That pillow cannot the proper weight of our head. And the normal pillow is not designed with the size of your neck.This data is transmitted in a mobile app. This pillow is connected with a sensor which is reading through sensors like temperature sensor is also used in thus pillow then the sensor is recording the input then processing the data and show the result. The materials involve in this project are health science and electronics.

IV. ADVANTAGES AND CHALLENGES

The advantage of electric smart pillow is improvement for sleep quality

1. Stress Reduction: - Smart pillow can help reduce stress by analysing sleep pattern.
2. Sleep disorder management: - This pillow is best for effective people who snore during sleeping period.
3. Temperature: - Smart pillow can adjust the pillow surface and the room temperature.

There are some disadvantages of electric smart pillow.

1. Cost: - Smart pillow are more expensive as compare to normal pillow.
2. Dependence on Technology: - Smart pillow which is dependent on technology for monitoring the sleep quality.
3. Maintenance-smart pillow require more maintenance as compare to normal pillow.
4. Durability-In the smart pillow the electronic item which is required for this pillow are less durable over time.

V. CONCLUSION AND FUTURE SCOPE

The design of a Smart Pillow for improved sleep quality in India presents a promising solution to address sleep-related issues. Integrating innovative technologies tailored to the Indian context can potentially enhance users' overall sleep experience, contributing to better health and well-being. Further research and collaboration with sleep experts and local communities will be crucial for refining and implementing this concept effectively. As a result, it may be stated that everyone, from adults to children, is under extreme stress. Rising stress in today's man has resulted in the cause of various ailments such as high blood pressure, headaches, insomnia, and so on. Science and technology are progressing. We want to be able to evaluate people's stress levels and so protect them from hazardous diseases.

The future scope of electric smart pillow for improving in sleep quality. Smart pillow which is made memory foam for comfortable sleep. The features which design in this pillow are temperature control, snore detecting. They are design to monitor and analyse sleep patterns.

VI. ACKNOWLEDGMENT

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BIOGRAPHY

- Robin Jaiswal is currently pursuing BTech CSE at Vivekananda global university Jaipur, Rajasthan. Robin has a strong interest in software web development and information technology. He has joined a university's Coding club, where he collaborates on various projects and participates in coding hackathons.
- Kajal Kumari is currently pursuing BPT at Vivekananda global university Jaipur, Rajasthan. Kajal has joined the university's Arogyaclub and she actively participates in university clubs and seminars that enhance her understanding of physiotherapy program.
- Pramod Kumar is currently working as Associate Professor in Department of Mechanical Engineering at Vivekananda global university Jaipur, Rajasthan.