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kHealth Bariatrics: A Multisensory approach to monitoring Patient's Postsurgical Behavior

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ABSTRACT

The rate of obesity is on the rise reaching epidemic proportions. According to American Society for Metabolic and Bariatric Surgery (ASMBS), 500 million people all over the world are obese. The data from Centers for Disease Control and Prevention(CDC) shows that more than 36% of adults in the United States have obesity. According to World Health Organization (WHO), 65% of the world's population lives in countries where the occurrence of death due to overweight and obesity is higher than being underweight. It is well established that weight loss surgery can play a significant role in reducing, or even eliminating medical problems associated with obesity. Weight recidivism is one of the biggest challenges following bariatric surgery. As many as 50% of patients may regain a small amount of weight two years or more following their bariatric surgery. A lifetime commitment to diet and behavior modifications after surgery are essential for success after undergoing surgery.

In this project, computer scientists working at Kno.e.sis, an Ohio Center of Excellence in BioHealth Innovation, are collaborating with a bariatric surgeon and a psychologist to bolster weight loss surgery patients for appropriate postsurgical progress. In our mobile personalized digital health solution, we use an Android application coupled with sensors to monitor patient's compliance with post-surgery progress and motivate patients to have proper follow-ups. The sensors include a wireless weighing machine that automatically sends data to the cloud, activity and sleep monitoring wristband which also measures heart rate, water bottle sensor and pill bottle sensor which prompts the patient for proper intake of water and vitamin pills. Additionally, the android app with its simple questionnaire helps in monitoring the patient's diet and emotional well-being.

One of the key challenges for the surgeon is to continuously monitor the patient to identify the deviations from recommended postsurgical guidelines. We aid bariatric surgeons to identify noncompliance with direction by providing aggregated data of all the primary parameters to be monitored. We also monitor patient's mental health, following diet and sleep cycle. Thus, a joint effort with the surgeon and psychologist to track patient's postsurgical behavior differentiates our approach from others and contributes to improved outcomes for bariatric surgery patients.

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