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# **Pedometer intervention and weight loss journey in obese and overweight people**

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**Abstract**--Obesity is one of the world's most critical increasing medical concerns. It is a state in which excess body fat gathers to such an extent that it adversely affects one's health. Obesity provokes a variety of additional illnesses, namely diabetes, heart disease, high blood pressure, lung disease, and many more, and it has cost countless lives worldwide. It is common for people in sedentary occupations to become overweight, due to the workday usually taking up roughly half of one's waking hours. As a result, there is little time for physical activity when compared with other types of work. However, there are several ways to motivate an individual to be physically active and lose weight. A pedometer, which tracks every step you take, may be a major motivator, assisting a person to meet their fitness objectives by displaying how much an individual moves daily. It only offers a person good feedback, such as the more steps you walk, which is a wonderful incentive. Wearing a pedometer is a simple, non-invasive technique for an individual to enhance awareness of daily activity, which leads to greater physical activity. As a result of using a step monitoring gadget, the chances of acquiring extra weight are reduced.

**Keywords**--BMI, health, obesity, pedometer, sedentary.

**Introduction**

These days we are very familiar with the word obesity and overweight among us. All the credit goes to the new lifestyle we have adopted. Obesity is one of the world's most critical increasing pharmaceutical concerns. It is a situation in which excess body fat gathers to such an extent that it negatively affects one's

health. Excess weight can have a variety of negative health consequences, such as diabetes, heart disease, high blood pressure, lung disease, and many more, and it has cost countless lives worldwide (Rai & Yoga , 2021). People with body fat levels that are at or near the extremities of the body fat are more likely to have major health issues that lower their life expectancy and endanger their standard of living (Marinarai., & Y.P, 2019; Das & Yoga, 2019; Alaguraja & Yoga, 2017). Obesity is defined by excessive lipid storage. Obesity definitions vary, but the most frequently recognized corresponds to the WHO BMI (kg/m<sup>2</sup>) criterion. Obesity is defined as a BMI of  $\geq 30$  kg/m<sup>2</sup>. Obesity is classified into three classes: class 1 (30.0-34.9 kg/m<sup>2</sup>), class 2 (35.0-39.9 kg/m<sup>2</sup>), and class 3 ( $\geq 40$  kg/m<sup>2</sup>) (WHO, 2019).

Obesity is typically caused by overeating and sedentary lifestyles. This disease is not an overnight disease; it is a process that evolves over time as a result of poor lifestyle choices and unhealthy eating. These days, almost everyone works in a job that requires them to sit at their desk most of the day. Besides this, people have become so lazy that they often drive their cars and scooter instead of walking or cycling. So it is common for people in sedentary occupations to become overweight, due to the workday usually taking up roughly half of one's waking hours. As a result, there is little time for physical activity when compared with other types of work (Chan et al., 2004). The current obesogenic environment, however, makes it difficult for obese people to lose even a small amount of weight (Ross & Bradshaw, 2009).

A broad range of studies have shown that physical activity (PA) is highly beneficial for people of all ages, and such practices should be developed early to gain greater benefits and improve one's overall health (Carson et al., 2016). Some research has revealed that regular exercise and physical activity can increase cardiovascular fitness, body composition, blood lipid profile, and the retention of critical muscle mass (King & Senn, 1996). Many public health standards suggest that individuals should engage in 30 minutes of moderate-intensity physical exercise on most days of the week. In order to maintain a healthy lifestyle, experts recommend 10,000 steps per day, which equates to 150 calories per day for most adults (Rooney et al., 2005).

There are several ways to motivate an individual to be physically active and lose weight. The pedometer is one of the most important innovations. A pedometer, often known as a step counter, is a portable electronic or electromechanical gadget that records each step a person takes by sensing the movement of the person's hands or hips. It can measure walking, running, and sports activities that include all walking/running events. We can sum this up by saying that this device is used to determine how active an individual is. However, one should keep in mind that it does not measure certain types of physical activity such as swimming, cycling, and lifting a weight. Wearing a pedometer around an individual belt or wrist makes them more accountable for their fitness regimen and teaches them how to incorporate physical activity into their daily routine. People typically use these gadgets to motivate themselves to stroll more regularly or to measure the distance traveled while going about their daily routines. A pedometer, which tracks every step taken, may be a major motivator, assisting a person to meet their fitness objectives by displaying how much a person has

moved on a daily basis. Daily walkers may struggle to determine if their walks to the building or park have had any effect on their weight. So, one should consider using a pedometer to assess whether hitting the streets is paying off or not. At the moment, a high-quality pedometer is compact, affordable, and simple to use.

Among the best activities for decreasing a sedentary lifestyle and improving health is walking, particularly for obese people. Walking is a low-impact exercise that carries a low risk of injury and promoted weight loss. It has been found that walking uses 90% of all muscle fibers (including those of the lower and upper extremities), strengthens those fibers, and increases the strength and stability of the upper spine segment (Hagner-Derengowska et al., 2015). Thus, walking especially when accompanied by a pedometer can be an efficient approach to boosting the physical activity levels of a person. Several reports support that pedometers can help an individual lose weight, decrease body mass index, body fat percentage, and waist circumference measurement (Cayir et al., 2015).

### **Need of the study**

Obesity rates have risen dramatically over the last several decades, with devastating effects on public health and the economy. According to the measurements produced in the Healthy People 2010 initiative, the prevalence of obesity is alarmingly high in all social and economic classes, both genders, as well as all age groups (McKinnon et al., 2009). As per the WHO, worldwide obesity has nearly quadrupled since 1975. In 2016, approximately 1.9 billion individuals aged 18 and above were overweight. Over 650 million of these people were obese (WHO, 2019). Obesity raises the risk of illness and death and lowers the quality of life regardless of age, gender, or race. This disease is considered the mother of all diseases because obesity leads to many other deadly diseases. Weight loss is recommended as the main treatment option for obesity reduction by leading health authorities—weight loss objectives vary from 5% to 10% of starting body weight. There has been extensive research linking obesity to increased mortality and morbidity due to hypertension, dyslipidemia, diabetes mellitus, coronary artery disease, congestive heart failure, stroke, gallstones, osteoarthritis, sleep apnea, certain types of cancer (colon, breast, endometrial, gall bladder), menstrual abnormalities, impaired fertility, and increased risk during pregnancy.

There are adverse effects of obesity that go beyond medical consequences, as well as negative attitudes toward obesity within society at large and in the health care profession. These views manifest as actual disadvantages in a variety of typical undertakings, including admission to college, renting a home, and marrying. Obesity also has a significant economic impact. It is linked to greater healthcare costs as well as lower incomes. The entire cost of obesity in the United States is estimated to be approximately \$100 billion per year, including direct (health care) and indirect (lost productivity) expenditures (Devlin et al., 2000). However, it is observed that conscious weight loss causes a reduction in obesity-related health problems. A study has found that weight loss dropped diastolic blood pressure by 0.92 mm Hg/kilogram (Neter et al., 2003), improved asthma control (Dias-Júnior et al., 2014), cardiovascular risk factor (Ades et al., 2011), sleep apnoea, and hip/knee osteoarthritis was noted to be reduced (Haase et al., 2021).

### **Why choose pedometer**

- This device is a wonderful incentive that provides positive feedback to the user, such as the motivation to take more steps.
- Nowadays we can get these types of gadgets in the form of a smart watch or a band at a very reasonable price with several other functions. Furthermore, it is possible to install a free pedometer application on the individual cell phone if people do not wish to invest in a band or clip-on device.
- A pedometer might help an individual to realize how passive one's behavior is. Some of us are unaware of how little we move until we begin to measure it. Calculating how many more strides one can fit in over the day may be an enjoyable exercise (Shivaram, 2019).

### **Review literature**

Several studies support that wearing a pedometer may increase physical activity or steps (De Cocker et al., 2008). In a retrospective analysis conducted by Painter et al., (2017), 2113 participants were evaluated to determine how self-monitoring contributed to weight loss following a 6-month retrofit weight-loss program and to identify the factors that were implicated in weight loss outcomes. Individuals in the Retrofit Program lost a mean of -5.58 percent (SE 0.12) of their baseline weight, with 51.87% losing at least 5% of their baseline weight (Painter et al., 2017). According to previous research, increasing physical activity by pedometer walking combined with individual motivational interviewing may be an effective approach for reducing body weight and BMI in Thai schizophrenia patients who are obese or overweight (Methapatara & Srisurapanont, 2011). According to studies, using pedometers regularly is related to considerable improvements in physical activity (Bravata et al., 2007). The pilot study has shown that using a pedometer significantly increased their steps/day, by 36%.

Furthermore, the pedometer group had a substantial drop in systolic blood pressure ( $112.8 \pm 2.44$  mm Hg) compared to the control group ( $117.3 \pm 2.03$  mm Hg) (Pal et al., 2009). Rooney et al., (2003) investigated if wearing a pedometer might significantly increase physical activity awareness and quantity among female staff in a big health care environment. Establishing daily step targets, maintaining a diary of steps walked, and always wearing a pedometer were the indications most likely to predict substantial changes in the level of awareness and amount of physical activity, self-efficacy, and other physical benefits. The majority of participants (71%) indicated that they would continue to wear the pedometer after the study ended (Rooney et al., (2003). Similarly, Cai et al., (2016) conducted a meta-analysis on 1258 individuals to determine if pedometer intervention increases weight loss. Pedometer intervention resulted in considerably lower BMI (0.29 to 0.02) and weight (1.12 to 0.17 kg) (Cai et al., 2016). Other reasons exist for the reported decreases in BMI and weight as a result of pedometer intervention in overweight and obese persons with Type 2 diabetes. It is established that persons with Type 2 diabetes who got pedometer instruction became more vigorous than those who did not (Qiu et al., 2014). Shenoy et al., (2010) investigated the impact of an aerobic walking programme utilizing a heart rate monitor and a pedometer on diabetes management parameters in Asian Indians with type 2 diabetes. With the use of heart rate

monitors and pedometers, an exercise program was effective at decreasing hemoglobin A1c, fasting blood sugar, and BMI levels, as well as improving general well-being (Shenoy et al., 2010).

### **Conclusion**

Obesity prevalence has grown significantly in several countries in recent years, generating interest in the health and economic consequences of this pandemic. Thus, a pedometer is a promising device for supporting weight loss in overweight and obese persons, as well as normal people, by gently decreasing BMI and weight while enabling them to live a normal life. Because the more physical activity and exercise we undertake, the better our health will be.

### **Conflict of interest**

The authors declare that there are no conflicts of interest.

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