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Physical Activity and Its Technology in Patients with Chronic Disease

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ABSTRACT

Diseases (NCDs) have a high mortality rate. This disease is very closely related to an unhealthy lifestyle, including nutritional intake, physical activity, consumption of alcohol and cigarettes. Regular physical activity can increase the chances of living longer by lowering the risk of chronic disease. Pedometer is a technology that can be used to assess and motivate physical activity behavior.

1. Introduction

Non-communicable diseases (NCDs) are the main causes of death globally. WHO data show that 41 million people die annually, equivalent to 71% of all deaths globally due to NCDs, which is one of the most common, expensive, but preventable health problems of all health problems. NCDs are strongly associated with unhealthy lifestyle habits, including improper nutrition, lack of physical activity, smoking, alcohol consumption, consuming too much caffeine, and improper sleep habits. In addition to the elderly age group, risk factors that contribute to PTM are also commonly found in the younger population. A healthy lifestyle has many benefits, for example, by increasing productivity, psychological well-being, physical capacity, self-esteem, ability to cope with

stress and reduce the risk of premature death. One healthy lifestyle that has health benefits is to participate in regular physical activity. Physical activity will not only increase a person's chances of living longer, but can also help control weight, reduce the risk of cardiovascular disease, type 2 diabetes and metabolic syndrome. Regular exercise strengthens bones and muscles, prevents falls among older adults, improves mental health and mood, and increases the ability to perform daily activities. The highest level of physical activity is in young adults with a figure of 53% from the age of 18-24 years who are categorized as quite active. The level of physical activity tends to decrease with age, with the lowest value being 75 years and over, usually the average



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spent in physical activity is 20 minutes per day. Adequate level of physical activity is associated with various factors, namely socioeconomic, health status, smoking status, and activity. Individuals who have a high economic level are 1.5 times more likely to get enough physical activity compared to individuals who have a low socioeconomic status. bad health. Individuals who do not smoke compared to individuals who smoke have 1.2 times more physical activity than individuals who smoke.¹⁻³

Technologies in physical activity measurement

Pedometers are simple and inexpensive body motion sensors that are easy to use by researchers and health practitioners to assess and motivate physical activity behavior. Pedometers represent simple and affordable hardware but without software (e.g. guidelines, indexes/intersections/benchmarks, programs) their utility is limited. Tudor-Locke (2009) reported that the duration of physical activity monitoring using a pedometer ranged from three days to one year although the most frequently used was seven days. Three days is considered sufficient to determine the level of physical activity determined by the pedometer because it is defined as an average of seven days in a healthy adult population. Populations with chronic sedentary disease appear to need less time to obtain stable estimates of habitual physical activity. Accupedo, an example of a pedometer app, monitors daily walking steps and calculates physical activity levels. With over five million downloads and an overall score, it is one of the most popular apps in the health and fitness category. The accuracy of this application is based on a three-dimensional (3D) motion recognition algorithm that tracks walking patterns by filtering and rejecting non-walking activities. Usually the intelligent algorithm starts tracking after ten consecutive steps, then stops and restarts automatically as you walk, but the advantage of this app over other commercial sensor 2D pedometers is Accupedo's ability to count steps

regardless of where you put the phone, such as pocket, belt or bag. Apart from that, Accupedo App is a low cost and easy to use app with sufficient display modes like steps, distance, minutes and calories in lite and pro versions. Its flexibility provides a simple widget display on the home screen of the mobile device where the user can select different display modes. In-app settings allow customized personal settings such as sensitivity, gender, unit, height, weight, and more. The most important component for the accuracy of walking and walking is the stride and successive steps. The user has to calculate the average walking or running stride distance by taking 20 normal steps and measuring the distance between the start and end line then dividing the total distance by 20 steps.⁴⁻⁹

2. Conclusion

A total of 31% of the world's population does not meet the minimum recommendations for physical activity. The use of a pedometer was associated with a significant increase in physical activity (approximately 2000 steps per day) and a reduction in body mass and blood pressure. Predefined step goals (10 000 steps) and step records are the main motivating factors for increasing physical activity. Thus, this low-cost application can increase the level of physical activity in the population. In addition, people do not need to use additional devices such as commercial rangefinders because they usually carry cell phones with them at all times. Users also receive motivational messages and in that way they can prevent one of the biggest problems associated with physical activity such as lack of motivation to actively participate. Daily feedback and percent of archived goals can be additional motivating factors for changing one's lifestyle from active to active.

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