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PHYSICAL ACTIVITY IN SCHOOLS AS A MEANS TO COUNTER THE GLOBAL OBESITY PHENOMENON

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Obesity today is a worldwide epidemic which has reached all corners of the globe.¹ Obesity is a complex disorder and a major health risk factor linked to increased cardiovascular disease, stroke, cancer, hypertension, diabetes, and early death.² An obese person who has a stroke has a higher risk of mortality.³ Research shows that obese individuals have an incredible 104% increase in the risk of developing heart failure compared to non-overweight individuals.⁴ Those with abdominal obesity are at particularly high risk for cardiovascular disease, diabetes, and all-cause mortality.⁵

The American Heart Association reported that More than 35% of adults in the United States are obese.⁶ In 2013, no state in the U.S. had an obesity rate of less than 20%, 42 states had a prevalence equal to or greater than 25%, and 20 states had a prevalence equal to or greater than 30%. It is estimated that obesity rates for adults could reach or exceed 44% in every state by 2030.⁷ More than half a billion adults (10% of men and 14% of women) worldwide were estimated to be obese in 2008 compared with almost half the prevalence in 1980 when 5% of men and 8% of women were obese.⁸

Recent statistics by the World Health Organization (WHO) indicated that worldwide prevalence of obesity more than doubled between 1980 and 2014. These WHO global estimates show that in 2014, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 600 million were obese. It further states that in overall, about 13% of the world's adult population (11% of men and 15% of women) were obese in 2014. In 2014, 39% of adults aged 18 years and over (38% of men and 40% of women) were overweight. In 2013, 42 million children under the age of 5 were overweight or obese.

Childhood obesity, in particular, has become a major public health concern. According to estimates in 2004, 10% of school-age children worldwide were overweight and 2–3% were obese.⁹ In a study performed between 2011 to 2012, it was concluded that 17% (or 12.6 million) of children aged between 2 to 19 years are obese, and 31.8% are considered overweight or obese.¹⁰ Childhood obesity is associated with increased cardiovascular mortality and morbidity in adult life. Evidence suggests that non-physically active children or adolescents are more likely to become non-physically active adults, and encouraging the development of physical activity habits in children could help to establish patterns that remain into adulthood (Watts, Jones, Davis, & Green, 2005).

The relationship between childhood obesity and academic achievement is of interest.¹¹ Outside the US, of 10 studies¹² published between 1994 and 2012, five found an

inverse relationship between obesity and academic achievement,^{13,14,15} one found no significant relationship, and four found results which varied depending on sex and/or age/grade.^{11,16,17,18} Childhood and adolescent physical inactivity and obesity as well as certain lifestyle behaviors such as the use of tobacco and alcohol consumption, which are associated with high blood pressure, have increased among the young population.¹⁹ Teenagers who are in the period of change and growth in the physical, mental and social aspects may be predisposed to be overweight and obese along with other factors such as genetics, daily routine, metabolic and environmental factors.²⁰

Gender differences in the perception of body weight have been well documented worldwide. In general, males tend to underestimate their body weight, while females tend to overestimate their body weight.^{21,22} Amongst the US undergraduate population, there is substantial evidence that weight-related social pressures are associated with a variety of negative health and well-being outcomes, particularly for women.²³

In June 2013, in an effort to make the medical community and the US population more aware of the obesity epidemic, the American Medical Association (AMA) classified obesity as a new disease (Medical News Today, 2013). It has been projected that in the next decade, there will be a worldwide increase (15%) in death rates from cardiovascular diseases (CVDs): Africa will record over 20% increase.²⁴ This will make CVD the most common cause of death compared to communicable diseases and it is projected to affect the younger age population especially in most low and middle-income countries.²⁵ Most of these deaths will be attributed to high blood pressure.^{26,27}

A search for observational studies was carried out using several electronic databases from June 2004 to June 2008, to see whether there is any evidence on associations between objectively measured habitual physical activity and adiposity. Their review supports the hypothesis that higher levels of habitual physical activity are protective against child and adolescent obesity.²⁸

The Institute of Medicine in the US recommended using school-based measurements of body mass index (BMI) as a way to prevent childhood obesity, in that communities can use the surveillance of childhood obesity as a tool to inform the development of policies and programs to improve children's health.²⁹ BMI is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2). The WHO BMI data (WHO, 2014) is a cross-section of the world population as it was taken across all countries. BMI is classified as being underweight if it is less than 18.50, Normal if between 18.50 and 24.99, Overweight if greater than 25.00, and Obese if it is greater than or equal to 30.0. BMI Values are independent of age and it is similar for both males and females.

Himes (2009) and Lopez-Jimenez and Miranda (2010), have competently demonstrated that the current use of BMI scales to determine the prevalence of obesity in the various populations is clinically adequate and appropriate.^{30,31} Furthermore Ogden, Carroll, and Flegal (2008), and Himes (2009), stressed that BMI ratios due to their simplicity are relevant and important as an overweight and obesity indicator especially in the study of children and adolescents.^{30,32} Persons with a BMI of >30 have a reduced life expectancy of 2–4 years compared to healthy weight adults; adults with severe obesity (BMI >40) lose 8–10 years of life expectancy, comparable to the effects of smoking.³³ Physically active adolescents are at a lower

risk of developing other conditions such as type II diabetes in future.³⁴ Hence BMI and Physical activity are notable factors that relate with Blood Pressure, and so prevention should begin early in life.^{35,36}

At the 65th session of the WHO Regional Committee for Europe, Dr Zsuzsanna Jakab, the regional director for Europe said that the number of people suffering from non communicable diseases by increasing physical activity levels and reducing sedentary behavior can be drastically reduced. Overweight and obesity, as well as their related non communicable diseases, are largely preventable. Supportive environments and communities are fundamental in shaping people's choices, making the healthier choice of foods and regular physical activity the easiest choice (accessible, available and affordable), and therefore preventing obesity.³⁷

Physical activity is generally seen as a broad term used to describe all forms of large muscle movements including sports, dance, game, work, lifestyle activities and exercise for fitness.³⁸ It is also defined as any body movement carried out by skeletal muscles which require energy production.³⁹ Exercise is a planned physical activity which should be performed repetitively to develop or maintain fitness. Regular physical exercise is also regarded as an important healthy lifestyle in which a large number of people can participate in order to impact significantly on their health status.^{38,39}

Appropriate participation in some form of physical activity assists young people to develop healthy musculoskeletal tissues (bones, muscles and joints), a healthy cardiovascular system (heart and lungs) and neuromuscular awareness (coordination and movement control). It also assists in maintaining a healthy bodyweight and has been shown to have psychological benefits such as an improvement in control over anxiety and depression.⁴⁰ Childhood and adolescent physical activity has an effect on adult obesity and blood pressure. Physical activity reduces risk of obesity, which once established in adolescent and youthful age is hard to reverse.⁴¹

Despite the numerous benefits of physical activities, physical activity levels are reported to be decreasing among young people in countries around the world, especially in poor, urban areas where it is estimated that less than one-third of young people are adequately engaged in physical activities. This decline is believed to be largely due to increasingly common sedentary lifestyles, lack of emphasis on the importance of physical education and reduction in other school-based physical activities. The downward trend in the physical activity pattern found in adolescents could also be attributed to the fact that the pre-adolescence adolescence stage of life marks the beginning of a critical development transitional stage during which many youths have a tendency to become sedentary.⁴² More people are living sedentary lives like sitting all day at work, watching television, spending leisure time in front of a computer and using a car instead of walking or cycling. Combined with a diet high in fat, salt and sugar, this has contributed significantly to the number of deaths and disability from cardiovascular disease in the European Region.⁴³

To conquer detrimental physiological and psychological outcomes associated with obesity, a number of novel encouraging interventions using social media tools to promote behavioral change are being introduced to influence students to be more active and to pay closer attention to their dietary intake.^{44,45} The influence of overweight and obesity in some urban areas, has led agencies like the WHO "to advocate using community (re)design as a tool to curb obesity" in some developed countries. Some of these advocated interventions include

improvement of geographic availability of supermarkets in underserved areas, access to outdoor recreational areas and enhanced infrastructure to support walking.⁴⁶ The United States Congress recognized the potential role that schools can play in promoting student health, combating problems associated with poor nutrition and physical inactivity, and ultimately preventing childhood obesity.⁴⁷

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