



COVID-19: a one-way ticket to a global childhood obesity crisis?

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Abstract

Obesity is a global epidemic based on three major pillars of (i) genetic (ii) behavioural and (iii) environmental determinants. The latter two pillars have been challenged during the course of the COVID-19 pandemic across all population age groups including children. The closure of schools resulted in decreased organised physical activity, increase in sedentary lifestyle and screen time with the possibility of stress-induced indulgence in high calorie dense and sugary foods, resulting in higher susceptibility to weight gain. The uncertainty faced by many Northern Hemisphere governments as the new scholastic year looms closer whether to open schools again or not further enhances the stress on the children and their family. Re-opening of schools is beneficial for children's mental and physical health, and general wellbeing including the 'combating' of the childhood obesity epidemic. The family unit has also been challenged during this pandemic especially if the parent/s suffered redundancy. There have been attempts at seeing a silver lining as some families have embraced lockdowns as a means to strengthen their family bonds, increase homemade meals apart from the various virtual opportunities that were streamed on social media to encourage children to perform physical activity at home or in safe environments. However, curbing the viral spread while protecting population health will remain top priority until an effective COVID-19 vaccine is available. It is imperative to address other co-existing problems such as childhood obesity, which if uncontrolled may have a long-term profound health and economic consequence of higher eminence than the actual COVID-19 infection. The prevention and management of childhood obesity should be set as a priority at an individual, community and population level during this pandemic.

Keywords Childhood obesity · Coronavirus · Prevention · Population health

Introduction

Obesity is a global epidemic with an estimated 158 million children-adolescents (5 to 19 years) expected to be obese by the year 2020 [1]. Obesity is a complex heterogenous disease based on three major pillars: (i) genetic determinants (ii) behavioural determinants and (iii) environmental determinants [2]. During the unprecedented times of the COVID-19 pandemic, the latter two modifiable pillars may have potentially

been affected [3]. Many governments across the world instituted a number of protective and containment measures including the closure of schools and lockdowns during the first wave of COVID-19 [4]. At the time of writing (September 2020), the Northern Hemisphere governments are being faced by a difficult decision whether to re-open schools for the new scholastic year or not [5]. The aim is to discuss the potential impact that the COVID-19 pandemic might have on the children and the associated risk of a global obesity crisis.

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COVID-19 impact on childhood obesity

Effect on dietary habits

The 2019–2020 scholastic year was abruptly halted. Physical classroom learning was abolished, forcing children to stay at home and shift their learning to virtual means. Some countries went into complete lockdowns that restricted the family unit to their home, with only allowance to go out for essential

shopping and for restricted physical activity. This led to a number of families panic shopping and storing long shelf-life foods that are typically ultra-processed and calorie-dense in order to minimize their trips to the supermarket [6]. Lockdowns are stressful periods, even for children, with a potential impact on their behavioural attitude. As a consequence, stress-eating of readily available high calorie dense food and sugary beverages ensues [7]. Such actions enhanced the susceptibility to weight gain especially if the amount of daily physical activity was reduced due the restrictions implemented [8]. However, not every household under lockdown experienced such a change in behavioural attitude or food habits as some families considered these unprecedented times as the perfect opportunity to cook homemade food and opted to buy fresher food more than before [8]. Such a positive experience might have a long term effect on children's food intake and preference for fruit and vegetables [9]. Of note, unfortunately a number of jobs were lost during the pandemic leading to financial constrains with a consequential change in grocery shopping to less expensive shelf-stable food. Such a socioeconomic change might have a negative effect on children's dietary habits [10].

Effect on physical activity

Closures of schools resulted in the absence of organised physical activity sessions leading to a higher risk of prolonged sedentary periods and increased weight gain among children [11]. Children residing in urban areas and/or within small apartments are faced with greater challenges due to limited space or opportunities for physical activity and hence they are more susceptible to weight gain [6]. Furthermore, during the first wave of COVID-19, leisure centres including playgrounds were closed off, with an advocacy to stay at home [4]. Some countries, such as New Zealand, issued a guideline on "Play, active recreation and sport" depending on the local COVID-19 situation. This enabled families to identify which activity was permissible and safe to follow and which was not [12]. Other countries, such as the small European Island of Malta, broadcasted a daily physical activity programme on national television for children and adults alike, to follow while at home [4].

COVID-19 and screen time

Prior to the COVID-19 pandemic it was reported that online platforms were extensively used by the young generation to communicate with others, to play video games and to access social media [13]. The pandemic brought with it a higher screen time for children as schools shifted to virtual learning. Although this was beneficial for educational purposes and social communication between children, their friends and their educators while social distancing, the increase in screen time

can further exacerbate sedentary habits as well as increase the risks for anxiety, depression and inattention [14]. Indeed, it was reported that screen time increased by approximately five hours per day when compared to the pre-COVID-19 period [7]. A link has been established between increased body mass index (BMI) and body fat percentage as screen time increased [15]. Furthermore, screen time is also associated with increase in snacking and a consequent increase in weight [16]. It is imperative therefore to establish a balance between screen time and active time. This is a challenge during these unprecedented times. However virtual platforms have been used by some schools to organise physical activity classes for children to easily follow at home [4]. Such initiatives should continue and be more readily implemented during these COVID-19 times.

Effect of closure of schools on obesity rate

Pre-COVID-19 studies reported that children had higher tendencies to experience weight gain during the summer holidays. Such weight gain is difficult to shed and actually accumulates from one summer to another [17, 18]. Hence, if one considers the COVID-19 lockdown period as an 'early onset-summer holiday', it could be anticipated that the childhood obesity rate will rise proportionately to the number of months the schools remain closed. Indeed, in the US it was hypothesised that should schools remain closed till December 2020, an upsurge of 1.27 million new obesity cases among children will be recorded [19].

COVID-19 impact on environmental determinates of obesity

Irrelevant whether living under the COVID-19 pandemic or not, the family environment has an important impact on every child's behavioural characteristics [20]. If the family follows a sedentary lifestyle, it is almost inevitable that the child will follow such a habit. It is also important to remember that the foetal environment plays an important role in the unborn child's life course. Indeed, the presence of obesity during pregnancy has been linked with childhood obesity as well as diabetes and cardiovascular disease [21]. At the onset of the COVID-19 pandemic, pregnant women were considered as forming part of the vulnerable group and were even mandated to stay at home by some governments [4, 22]. However, as part of the containment measures to curb the viral spread, most of the routine hospital visits were temporarily cancelled or postponed including the antenatal routine check-ups [4]. Hence, this put extra pressure and stress on the pregnant women as they needed to pay extra attention to their health while maintaining a good weight during these unprecedented times. Such stress might have led to pregnant women to indulge in

easily accessible food while following a sedentary lifestyle with potential weight gain and deterrent effects on the unborn child. As restrictions were slowly lifted, pregnant women had to make the difficult decision whether accessing antenatal care was more important than the risk of exposure to COVID-19, further increasing stress upon the pregnant women [23]. It is important to note that remote antenatal care was available in some places [23].

Not all COVID-19 pandemic related measures brought about nasty outcomes as these unprecedented times may have brought families closer together. Parents that shifted to telework had more time with their children. Needless to say, these faced new challenges in trying to balance taking care of their children, home-schooling them while at the same time tele-working. Nonetheless stronger family bonds are expected to have been developed as more family events under one roof had to be catered for.

Imminent and post-COVID recommendations

As Summer 2020 comes to an end, countries are faced with a number of challenges as the new scholastic year approaches. Children's education, social and emotional skills are hanging by a thread following the abrupt termination of physical learning. It is adamant that children are re-introduced to an educational routine and facilitate physical activity [24]. This will not only be beneficial for their behavioural health but also forms part of the 'fight' against childhood obesity. However, safety measures and threshold indicators for the identification of local COVID-19 risk transmission within schools is crucial [5].

Curbing the viral spread while protecting population health will remain a top priority until an effective COVID-19 vaccine is available. However, it is imperative to address other co-existing problems such as childhood obesity, which if uncontrolled may have a long-term profound health and economic consequence of higher eminence than the actual COVID-19 infection [10]. Healthcare and educational systems should engage in an adequate supporting and managing system to deal with childhood obesity. Educating the parents on food availability, convenience and how to choose food wisely even if on a budget, is an issue that needs to be tackled. Advocacy for physical activity while maintaining social distancing is a must. Special attention should also be given to pregnant women with obesity to protect and prevent obesity developing within the life course of the unborn child. The prevention and management of childhood obesity should therefore be set as a priority at an individual, community and population levels during this pandemic.

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Compliance with ethical standards

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