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GUEST EDITORIAL

COVID-19 pandemic… what about the obesity and inactivity "pandemics"?

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With South Africa and the rest of the globe in lockdown for COVID-19, every citizen is finally grasping the meaning and extent of the word "pandemic". Yet, there are other "silent pandemics" that receive insufficient media attention, *viz.* the obesity "pandemic"[1] and the inactivity "pandemic", which were first described in 2012.[2] The prevalence of obesity is rising even amongst the youth[3] and even without the added factor of being confined indoors, global physical inactivity is rising.[4] However, has the economic impact of inactivity been considered? Global obesity and physical inactivity's contribution towards chronic diseases and premature death is estimated to have a cost of up to $145 billion annually, as estimated in 2013.[5] Furthermore, a quarter of the world's adults (1.4 billion) are susceptible to physical inactivity-related diseases.[4] Kohl et al. reported that up to 10% of global non-communicable diseases (NCDs) deaths result from physical inactivity, whereas the percentage increases to 30% for specific disease categories such as heart disease.[2] Millions of global deaths from NCDs could have been circumvented if people were passably physically active.[2]

An examination of the causal chain of NCDs starts with behavioural changes (including physical inactivity, poor nutrition, *inter altri*), which, unmanaged, lead to physiological changes that include obesity, blood pressure changes and raised blood glucose. A further progression results in NCDs including diabetes, hypertension, heart disease amongst others.[6] The latter, unchecked, ultimately results in end stage disease *viz.* kidney failure, heart failure, amputations among others. If the cost of end stage disease treatment were to be considered, the ultimate cost would be astronomical,[5] whereas the interventional cost is comparatively negligible in the behavioural stage.

Further consideration of the modifiable behavioural factors reveals that physical activity exhibits a dose response effect on obesity, independent of dietary changes.[7] This emphasises the importance of including exercise as part of the holistic management of obesity. A preliminary study by Thayer et al. found that even small bouts of exercise (five mins) can influence behaviour by reducing the craving for a sugary food or beverage, suggesting that it's not just the total volume of exercise, but the timing in relation to the craving, which is also important.[8] So, small sessions of exercise can divert the desire for the sugar "fix", but the question which needs further research, is, does increasing physical activity and/or increasing fitness, ultimately influence the desire to eat unhealthy food (including sugary beverages)?

Adult obesity is rising world-wide and so is obesity in the youth.[3] Considering the modifiable behavioural change in the form of nutrition and specifically sugary beverages, Tugendhaft et al. in 2016 used predictive modelling over a five-year period and calculated that, due to the combination of increased sugar-sweetened beverages, as well as population growth, there would be a 16% increase in obesity prevalence in South Africa.[9] In the case of diabetes, Oggioni et al. predicted that an annual 1% increase in inactivity will result in double the number of people diagnosed with diabetes over the next twenty years.[10] In addition, physical inactivity was found to be an independent risk factor for diabetes over and above diet.[10] A study in Burkina Faso found an urban cohort had higher sugar, fat and meat intake (which included sugary beverage consumption) and lower exercise levels than a rural cohort, yet both cohorts had equal prevalence of cardio-metabolic risk factors (CMRF) (abdominal obesity, hypertension, hyperglycaemia, dyslipidaemia prevalence).[11] CMRF among both cohorts could be explained by the higher carbohydrate intake by the rural cohort (despite higher physical activity levels).[11] However, by contrast, Gradidge and Kruger, in the current SAJCN issue, highlight the reverse urban/rural disparity where higher sugar-sweetened beverage intake and lower physical activity levels were found among rural participants as opposed to urban participants in South Africa.[12] Though, the Burkina Faso study also found that women, low income, low physical activity levels and rural cohorts were significant causal factors in the combined nutritional deficiencies and CMRF.[11] Possible reasons for the differences between the above-mentioned Burkina Faso and South African studies need to highlighted: The South African study urban cohort was comprised of students (18–30 years), which is not necessarily reflective of the broader urban population, whereas the Burkina Faso study included a randomised sample of individuals aged between 25–60 years.

Both studies included physical activity and anthropometric measures, but the South African study only investigated beverage consumption, whereas the Burkina Faso study considered the full dietary intake, which included soft drinks, alcoholic beverages and local sweetened juices.[11,12]

Gradidge and Kruger suggest an educational campaign on enhancing nutritional fact label reading and disease prevention measures.[12] Another consideration would be how to conduct this campaign again with the various stages of the COVID-19 lockdown in mind? Educational institutions are realising that rural South Africans may not have the internet connectivity taken for granted by urban dwellers. Perhaps, with mobile (e.g. WhatsApp) and social media (e.g. Facebook accessed via mobile devices), being the current preferred method of targeting the younger generation in a developing country,[13] a large portion of the population may be omitted in the dissemination of information via education campaigns. Therefore, a two-tiered approach may be needed for public education, which could be different in rural areas versus urban areas. In a study on the perceptions on the sugar content of fruit juice, a similar recommendation was made, namely education was recommended for lower sociodemographic regions of South Africa.[14]

Daily intake of one sugar-sweetened beverage "increases the likelihood of being overweight by 27% for adults and 55% for children."[15,16] The WHO is so concerned about sugar intake that it has released sugar intake guidelines; *viz*. "In both adults and children, WHO recommends reducing the intake of free sugars to less than 10% of total energy intake". They include beverages in their caution: "free sugars include monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates."[17]

While considering sugar, it cannot simply be claimed that all sugar is bad. Naturally occurring sugar in honey and fruit can be part of a healthy diet.[18] Those who get sufficient physical exercise, especially those who participate in endurance activities can safely incorporate natural sugar into their diets. In the road running fraternity of South Africa, soft drinks are provided on the roadside in races of longer than 10 km in distance. It would make no sense in this context to replace these beverages with sugar-free options.

It is known that the biggest impact on reducing NCDs and reducing treatment costs is by modifying behaviour. However, have we delved deep enough into what the motivating factors are for people to change their behaviour, that is, beyond financial incentives? As healthcare professionals, the incentive may be "health" above all, but does the individual (with the behavioural challenge) prize health above comfort? To what extent does personal belief impact motivation levels? In a study by Turnwald et al., perceived genetic predisposition to physiological fullness and satiety after eating, as well as physical endurance capacity influenced physiological findings. In other words, those who believed they had protective genes demonstrated a clear physiological response in the direction of the belief (longer endurance with less tiring, and production of hormones of satiety), independent of the actual genetic make-up. Stated differently, if one believes that a physical reality about oneself is true, then behaviour will manifest that belief.[19] However, the study was a randomised trial, so how does one get people to change their beliefs in a clinical setting without misleading them? Perhaps this too is a gap for research on both the nutrition and sports and exercise medicine fronts. Conversely, both Meisel et al. and Wang et al. found that people informed of greater genetic risk had a greater intention to change on follow-up, but without behavioural changes implemented; however, these studies did not investigate the physiological effects (e.g. hormones, weight and fitness).[20,21] On the other hand, Ahn et al. found that those who thought they were safe in terms of their genes made unhealthier food choices,[22] which begs the question what is the true motivating factor for change?

The final annual death toll from COVID-19 pandemic cannot yet be determined, nonetheless a national state of disaster has been declared and everyone is doing their part in stopping the spread of this pandemic. However, people with obesity and NCDs are known to be at a higher risk of dying from COVID-19. "Prevention and control of obesity and NCDs are crucial in preparedness for this and future public health threats".[23] The question has to be asked: is everyone willing to place as much effort in promoting physical activity in kerbing the obesity "pandemic"?

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