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Autor(es): Chia, Michael

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1 • INVITED STATEMENT

**SEATED LIVING- AN INDULGENCE AT
PERIL TO HEALTH: HOW BIOLOGY AND
BEHAVIOUR CONSPIRE TO ENTRENCH
SEDENTARY LIFESTYLES**

Michael Chia¹

Corresponding author: dean.ofa@nie.edu.sg

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ABSTRACT

Far more people are engaged in prolonged sitting as a matter of habit for work, transport and for leisure and it appears that both 'nature and nurture' contribute to this entrenched behaviour of choice. The health risks associated with prolonged sitting are higher than those for smoking. This exposes large segments of sedentary populations to shortened lifespans. More research and holistic intervention approaches in getting people to 'sit less and move more' are required to reverse-engineer sedentary behaviours in all segments and contexts of society.

KEY WORDS: Inactivity physiology, sitting is the new smoking, new intervention approaches

¹ National Institute of Education, Nanyang Technological University, SINGAPORE.

INTRODUCTION

There is now compelling evidence on the life-long demerits of being sedentary for long periods of time on a daily basis- shortened lifespan, poor quality of life and higher risks of diseases like type II diabetes, obesity, stroke, heart ailments, and come cancer forms (Chia, 2012). This is in spite of the advances made in terms of medical science and curative medicine. Yet knowledge and research about the dangers of entrenched physical inactivity are lacking. For instance, an online search of the terms inactivity physiology and exercise physiology, respectively, yielded 424 thousand versus 6.26 million articles at the time this editorial was written. A knowledge gap of the harm physical inactivity affects humankind concomitantly, is the consequence.

Populations at risk

In many developed economies, far more people in the population are exposed to the risks of physical inactivity than the people who smoke, yet far more research, resources and amelioration are funneled to curbing and discouraging smoking than physical inactivity. This imbalance needs urgent redress. Some data suggest that in the USA, at least more people will die in 2015 because of physical inactivity-associated ailments than smoking-associated deaths (Lee et al, 2012). At a more basic level, smoking one cigarette is projected to shorten lifespan by 11 minutes (Shaw et al, 2000) while sitting for one hour, shortens lifespan by 22 minutes (Veerman et al, 2012). Data show that among sedentary male adults, those who sat for more than 4 hours daily were more susceptible to lifestyle chronic diseases than those who sat for less than 4 hours daily (George et al, 2013). Other data show that prolonged sitting still harms even when people met the guidelines of 150 minutes of moderate-to-vigorous exercise per week (Biswas et al, 2015) but remained sedentary outside of the exercise time. However it appears that this ascendant finding is still not well publicized and many people are ignorant of the disproportionate dangers of 'seated living' for transport, for work and for leisure- it is not inconceivable that large segments of society in modern economies spend 50-70% of non- sleeping hours, predominantly sitting (Chia, 2014). Despite decades of warning from many respected world organizations (e.g. World Health Organization) and national associations of health (e.g. Ministries of Health), obesity and physical inactivity among developed economies continue to creep upwards and in some countries, they have spiraled out of control. For example, sources show that while obesity and overweight rates

in the USA, though leading the developed world, developing and newly developed countries in Asia, Malaysia, Thailand, South Korea and Singapore, Philippines, China, Japan, Indonesia, India and Vietnam, in that order are dealing with increasing rates (IHME, 2014). For instance, Malaysia has the highest obesity rates in South East Asia at 14% and also prevalence of Type II diabetes of 14.9% above age 30 and this compares with a world-wide prevalence of 2.6%. Singapore on the other hand, has lower rates of adult obesity at around 10% but have some of the youngest diabetes patients in Asia with 3 in 10 patients diagnosed with the disease below the age of 40 (Yeung et al, 2014). Adult Singaporeans also work the longest hours in the world, presumably with much of the time spent seated (Chia et al, 2015) but they do this at peril to health- three in ten people work between 51 to 60 hours a week, while 11 percent work more than 50 hours a week; working longer hours beyond 40 hours per week increased the risk of stroke by up to 33%.

The modern environment is obesogenic

It should be acknowledged that many useful things are accomplished when seated for transport, study, work and play and the language vocabulary is rife with phrases that describe this utility such as 'sitting for examinations' or 'parliament sitting' and although there are 'standing committees' and interest groups that 'take a stand', many of these activities are accomplished whilst seated. It appears that sitting behaviours are entrenched- in an inter- connected world and in an Internet space, it is possible to conduct activities like banking, shopping, business, meetings, play virtual games, watch sport, and dine at convenience without leaving your seat. Evermore youths and adults are drawn to the concept of 'seated living' or 'living-in-a-chair'. Moreover it appears that our biology (nature) conspires with our environment (nurture) to ensure that we expend the least energy as possible, even when running or walking (Salinger et al, 2015)

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Game-changing sustainable solutions are warranted

There is compelling need to re-engineer physical activity into the lives of children, youths and adults in the context of the conditions of home, school, worksites, transport and the community, interwoven into the fabric of the context and culture of the country. It is important for people to be given choices to be less sedentary throughout their lifespan across multiple contexts to be more physically active and to combat well-intentioned at-

tempts to 'socialize' generations of children and youth for occupations that predominantly require prolonged sitting (administration, finance, analyst, human resource, consulting, accounting, etc.). There is a need to challenge and act on altering the status quo across multiple contexts- for example, modify classrooms and lecture theatres to allow for students and participants who wish to stand and stretch at the back, cater to 'stand and sit' examinations, the use of 'just-in-time' prompts, through the day to remind people to get up and move about after a period of sitting, the use of personalized apps in smart devices to do the same, to name a few. These 'just-in-time' prompts should be pervasive in the environment- in school, at work, in restaurants and cafes and everywhere else where people congregate. Additionally, it is important for people in the forefront of healthcare- the ministries for education, health community development, and aging, national and international health organizations- to lead the way by adopting evidence-based practices in schools, workplaces and the community- that the merits of interrupting prolonged sitting in the context of home, work and the community (productivity, engagement, vitality, reduced risks of diseases), far outweigh the inertia and inconvenience of change. A lot more research is needed to establish what works and what does not to reduce prolonged sitting across different contexts and this work needs to continue for some time to come (Chia et al, 2015).

SUMMARY

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The ascendant view- prolonged sitting across multiple contexts continues to be entrenched and both 'biology and behaviours' of humans conspire to make this so. Many are still ignorant of the deleterious effects of sedentary lifestyles on human, health, longevity, vitality and productivity. Game-changing and sustainable solutions are required in terms of reverse-engineering, in making 'living in a seat' less desirable and 'sitting less and moving more' outside of regular exercising a 'new normal' in the future of mankind.

Author note: This editorial was conceived and written in the absence of prolonged sitting.

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