



**EXCESSIVE SCREEN TIME AND PHYSICAL INACTIVITY AMONG
SCHOOL STUDENTS IN THE PHILIPPINES**

By

PIORES VICTOR FELLO

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

February 2024

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DEDICATION

This thesis is dedicated to my family, to my ever supportive and loving wife, daughter, and son who stand as my inspiration and strength.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment
of the requirement for the degree of Doctor of Philosophy

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February 2024

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Sedentary behaviour among children has been a prominent global health concern. Previous literature showed that being inactive can impose various negative effects on individuals' health. This is further worsened by the excessive screen time brought about by rapid advancements in technology. Conversely, health experts and organisations continue to find ways to counter-measure the adverse impact of inactive lifestyle, with physical activity being propounded as a possible intervention.

The purpose of this study is to explore the relationship between non-academic sedentary screen time and physical inactivity among middle-school students. It also aims to design a framework for physical activity as an intervention against excessive non-academic sedentary screen time. This was achieved through a qualitative research design using the grounded theory approach. The data was collected via in-depth semi-structured interviews with 22 middle school students between the age of 11 to 13 years old and 20 parents/guardians. Thematic analysis was done to analyse the data through a multi-level approach (initial coding, focused coding, and theory building). The

results showed that the core category of bountiful hours of screen engagement and limited time on physical activity is due to installing Happy-place, in exchange for something and being last on the list. This entails the sequences and connections between participants' experiences. It was further revealed that these middle-school students perceive screen time as their happy place and that the presence of their friends greatly contributes towards physical activity engagement. Additionally, these students placed the least priority on physical activity as an option for daily activities.

These findings contribute to the body of knowledge by developing a framework pertaining to the non-academic sedentary excessive screen time and low physical activity engagement among school students. It also informs stakeholders and the community on how middle-school students interpret their experiences with gadgets and physical activity involvement.

Keywords: screen time, children, physical activity, grounded theory

SDG: GOAL 3: Good Health and Well - Being

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**MASA SKRIN YANG BERLEBIHAN DAN KETIDAKAKTIFAN FIZIKAL
DALAM KALANGAN PELAJAR DI FILIPINA**

Oleh

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Februari 2024

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Tingkah laku sedentari dalam kalangan kanak-kanak merupakan satu isu kesihatan yang ketara di peringkat global. Kajian terdahulu mendapati bahawa ketidakaktifan fizikal boleh menyebabkan pelbagai kesan negatif terhadap kesihatan individu. Ini diburukkan lagi dengan masa skrin yang berlebihan akibat kemajuan teknologi. Justeru, pelbagai pakar dan organisasi kesihatan telah mencari jalan penyelesaian untuk menangani gaya hidup tidak aktif, dimana aktiviti fizikal telah dicadangkan sebagai salah satu jalan penyelesaian.

Kajian ini bertujuan untuk meneroka hubungan antara masa skrin sedentari bukan akademik dan ketidakaktifan fizikal dalam kalangan murid sekolah rendah-atas. Ia juga bertujuan untuk mereka bentuk suatu rangka kerja aktiviti fizikal sebagai intervensi terhadap masa skrin sedentari bukan akademik yang berlebihan. Objektif ini dicapai melalui reka bentuk kajian kualitatif menggunakan pendekatan *Grounded Theory*. Data dikumpulkan melalui temu bual separa berstruktur melibatkan 22 murid sekolah rendah-atas yang berumur antara 11 hingga 13 tahun serta 20 ibu

bapa/penjaga. Analisis tematik dilakukan untuk menganalisis data melalui pendekatan pelbagai peringkat (pengekodan awal, pengekodan berfokus, dan pembinaan teori). Dapatan kajian menunjukkan bahawa “mewujudkan persekitaran yang gembira, sebagai pertukaran untuk sesuatu, dan menjadi yang pilihan terakhir dalam senarai” adalah kategori utama bagi penglibatan masa skrin yang berlebihan dan penglibatan aktiviti fizikal yang rendah. Ini melibatkan urutan dan perkaitan antara pengalaman peserta. Hasil kajian turut mendedahkan bahawa murid sekolah rendah-atas ini menganggap masa skrin sebagai persekitaran yang menggembirakan dan kehadiran rakan sebaya menyumbang kepada penglibatan dalam aktiviti fizikal. Selain itu, mereka meletakkan keutamaan pilihan yang paling rendah terhadap aktiviti fizikal sebagai pilihan untuk aktiviti harian.

Hasil kajian ini menyumbang kepada pengetahuan semasa dengan membangunkan suatu rangka kerja yang berkaitan dengan masa skrin sedentari bukan akademik yang berlebihan dan penglibatan aktiviti fizikal yang rendah dalam kalangan murid sekolah rendah-atas. Ia juga memberi maklumat kepada pihak berkepentingan serta masyarakat tentang bagaimana murid sekolah rendah-atas mentafsir pengalaman mereka dengan gajet dan juga penglibatan mereka dalam aktiviti fizikal.

Kata Kunci: masa skrin, murid sekolah rendah-atas, aktiviti fizikal, Grounded theory

SDG: MATLAMAT 3: Kesihatan yang Baik dan Sejahtera

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LIST OF ABBREVIATIONS

WHO	World Health Organization
AAP	American Academy of Pediatrics



CHAPTER 1

INTRODUCTION

1.1 Overview

This chapter provides an overview of physical activity among school students as well as their screen time engagement. It also highlights the current concerns related to the research topic, research objectives, and research questions. The significance of this study alongside its scope and limitations are also presented. Lastly, the definitions of key terms used throughout this thesis are discussed at the end of this section.

1.2 Background of the Study

Physical activity plays a significant role in children's development. Being active has a positive impact on individuals' physiological and psychological well-being (Biddle et al., 2021). It also helps to prevent or minimise the chance of acquiring negative health-related effects caused by inactivity. According to Archer (2014), being physically active has a positive effect on children in terms of non-communicable disease (NCD) prevention and mental health development. In addition, Guinhouya et al. (2013) stated that the chance of having non-transmissible chronic diseases is higher among children with sedentary lifestyle.

For the past decades, sedentary lifestyle among children has been considered a global issue. It was reported to have an adverse effect on physiological and mental capabilities while being a prominent factor for overweight, insufficient sleep, as well as psychological and behavioural issues (Domingues-Montanari, 2017). Past statistics showed that the majority of global population is inactive and that 81% of middle

school children are having sedentary lifestyle (World Health Organization [WHO], 2022). One of the activities prominently linked to inactive behaviour is screen time engagement.

Screen time is the engagement time of an individual to any “screen-based behaviours”, which can be inactive or dynamic (Tremblay et al., 2017). According to the report, a majority of time spent on screen by children was sedentary, such as using smartphones, tablets, laptops, and watching television. According to the American Academy of Pediatrics (2021), most kids are engaging in gadgets for almost seven hours a day. Screen time at present can be considered as part of daily activities or daily lives for various purposes, ranging from communication means, entertainment, and learning platforms. Conversely, screen time has been gaining its complex impression within the past several years along with massive technology improvement.

Technology advancement plays a significant role in people’s lives. However, its benefits and advantages also come with several negative effects. One particular issue that can be sought is excessive screen engagement. Too much screen time can cause gadget dependency disorder and this addictive behaviour has been meticulously linked to internet-based activities. Such condition describes a child’s constant dependency and extensive time spent on devices (Mata, 2018).

Excessive screen time refers to spending time on gadgets more than the daily recommended hours. According to the updated guidelines from the American Academy of Pediatrics (AAP) and World Health Organization (WHO) (2016), the recommended screen time for kids aged six to ten years old is between one to one and

a half hours per day and two hours per day for those between 11 to 13 years old. These organisations also endorse 60 minutes of physical activity per day among adolescents.

Consequently, the community's compliance with the recommended screen time remains a great concern. Most parents claim that hectic schedule is the main reason for screen time exposure and lesser physical activity engagement among children (Joseph et al., 2019). Allowing children to play with gadgets, such as mobile phones and tablets, is one of the ways for parents to keep their kids busy. Past literature denotes that excessive screen time for children should never be taken for granted by parents, with school principals and classroom teachers also showing concern for students spending too much time on gadgets (He et al., 2009). Previous studies unveiled several negative effects of excessive screen time, such as insufficient sleep as well as physical and behavioural problems (Ashton & Beattie, 2019). Prolonged use of mobile screens can also impact a child's brain (Andrews, 2017).

Excessive screen exposure, particularly among children, has become a significant area of concern due to its negative effects on physiological, psychological, and developmental health. According to Dahlgren et al. (2021), gadget exposure poses adverse effects towards physical and psychological health and well-being. As a result, children experiencing excessive screen exposure are prone to face issues like overweight, lack of sleep, developmental delays, anxiety, slow cognitive development, and decreased academic performance (Jones et al., 2021b).

Previous research has found an association between screen time and physical activity. For instance, Hrafnkelsdottir et al. (2018) reported a link between screen time,

physical activity, and well-being; Felix et al. (2020) revealed a relationship between prolonged screen time and lack of physical activity; and Ashton et al. (2019) stated that the negative effect of extended screen time is associated with non-compliance to factors like being physically active. Several researchers also acknowledge physical activity as a key activity to countermeasure the negative effects of excessive screen time (Kim Dang et al., 2018). Among the benefits include decreasing the possibility of being overweight and other chronic illnesses associated with obesity (Dahlgren et al., 2021) and promoting brain function development, psychological well-being, and overall physiological development (Contardo Ayala et al., 2024). This highlights the crucial necessity of managing and balancing screen and physical activity involvement among children (Figure 1).



Figure 1 : Balancing Screen Time with Physical Activity for Healthy Childhood Development

According to Chan et al. (2018), physical activity engagement lessens mood problems as it stimulates mood-regulating hormones in the brain. However, such notion was denied by García-Hermoso et al. (2020) who reported no association between physical activity and desirable mood or emotion. Other studies also reported that physical

activity engagement does not have a positive impact towards managing sedentary lifestyle, specifically in reducing screen time engagement. According to Hardman et al. (2014), interventions that involve active play showed no significant association in decreasing gadget exposure. Similarly, physical activity was reported as ineffective in reducing screen time (Vieira et al., 2018). Conversely, exercise was reported to have a significant effect on fitness level but not on screen exposure reduction (Tremblay et al., 2017). Outdoor recreation also offers no alternative to gadget use (Biddle & Asare, 2011). These findings agree with Dahlgren et al. (2021) who propounded that gadget use reduction is not directly associated with increased physical activity involvement.

Subsequently, these mixed results make screen time and physical activity a complex concept. Both screen time and physical activity were found to influence one another in several aspects, depending on the context and individual characteristics. Having a thorough understanding of this topic will help health professionals, experts, and the community to create programs or activities that can help to reach compliance with global movement guidelines and recommendations, thus serving as a countermeasure to the negative health-related effects associated with excessive screen time. Additionally, physical activity has been acknowledged to mitigate the negative impact of excessive screen time. Therefore, understanding physical activity and screen time engagement, particularly among children, can help to promote a more active and balanced lifestyle in the society.

Several intervention programs have been created globally to deal with sedentary lifestyle issues; however, the percentage of inactivity among the worldwide population is still on the rise. Content and context are valuable to have an effective intervention

(Johansson et al., 2022 ; Jones et al., 2021 ; Manini et al., 2015). Aside from engaging, the level of involvement in physical activity is also a factor that can be looked into in terms of intervention. It is also important to understand the factors related to sedentary behaviour and tailor them with health promotion programs aimed at decreasing screen time and improving the engagement level in physical activities (Fitzpatrick et al., 2019). Zhu et al. (2018) suggested that engagement in physical activities is among the prominent factors to consider in reducing screen time. The inclusion of physical activity into intervention programs can have a significant effect in reducing children's screen time and increasing their physical activity engagement; however, positive results may differ based on the intervention design, target population, and a number of specific components (Jones et al., 2021a).

In the worldwide strategy to improve the level of physical activity engagement, the World Health Organization (2019) stated that approaches must be designed according to the needs of the community. Therefore, this study is undertaken to explore potential frameworks that can be used in devising intervention programs or activities to address the complex relationship between excessive screen time and physical activity engagement.

1.3 Statement of the Research Problem

Active lifestyle is generally recognised to have positive effects on one's physiological and psychological well-being (Biddle et al., 2021). Nonetheless, the level of engagement and compliance in physical activity remains a major global issue. Statistics from the World Health Organization denoted that 81% of middle school-age children are having sedentary lifestyle (WHO, 2022). Inactive lifestyle is also

negatively linked to extended screen time among adolescents. According to Ashton et al. (2019), spending too much time on screen has an adverse effect on individuals' physiological and psychological health development. This is particularly evident in the Philippines where inactivity and gadget exposure are considered national issues. According to Purnell (2023), Filipinos are global top users of mobile phones as they spend almost one-third (32.53%) of the day in front of mobile screens. Consequently, 84.6% of children in the Philippines are deemed inactive due to their non-compliance with the recommended screen time and physical activity engagement (Cagas et al., 2022). Additionally, the World Health Organization ranked the Philippines as second globally for sedentary lifestyle, with 93.4% of the total population being inactive (Baclig, 2022),

Excessive screen time among school students has been gaining prominent attention and concern as it goes along with technology advancement. Several studies found that there are effects associated with excessive screen time, such as emotional disturbance (Hrafnkelsdottir et al., 2018), overweight, and obesity (Domingues-Montanari, 2017). Furthermore, previous studies unveiled that prolonged screen time can impact a child's brain (Andrews, 2017) and cause issues like mental health problems (Devi & Sigh, 2023; Wu et al., 2015), sleep problems, physical and behavioural problems (Ashton & Beattie, 2019), psychological health issues, and other social development interruptions (García-Hermoso et al., 2020; Muppalla et al., 2023). Therefore, several researchers have called for educators, experts, and professionals in related fields to design activities and programs that consider physical activity as an intervention for individuals experiencing screen time-related concerns (Kim Dang et al., 2018).

Subsequently, both content and context are valuable aspects to consider in order to make physical activity as an effective intervention (Johansson et al., 2022; Jones et al., 2021a; Manini et al., 2015). Nonetheless, standard strategies for physical activity promotion among school students do not exist (Schirmer et al., 2023). Therefore, exploring and understanding the screen time and physical activity engagement process among children is significant to provide a framework that can help in designing a flexible physical activity program as an intervention.

The majority of existing interventions aim to identify the significant effects of physical activity on excessive screen time. These interventions are based on the current participation guidelines provided by health professionals and health organizations. Even though physical activities are generally accepted to offer positive effects towards physical and mental health (Biddle et al., 2021), sedentary behaviour is still an issue across the globe. Several studies claimed that inactivity or sedentary lifestyle is adversely associated with extended gadget use. However, Hardman et al. (2014) and Vieira et al. (2018) cited that active play involvement has no positive effect in reducing screen time. Similarly, physical activity was reported to have a significant effect on fitness level but not on decreasing screen time exposure (Tremblay et al., 2017). Outdoor recreation and increased physical activity engagement do not provide an alternative to gadget use (Biddle & Asare, 2011; Dahlgren et al., 2021). In connection to excessive screen time, existing physical activity engagement interventions provided mixed results. Therefore, it poses a notion that screen time and active play involvement have a complex association and require further exploration. According to Pappas (2020), it is important to understand the factors impacting the young population's interpretation of their experiences during gadget use for managing and

balancing screen and physical activity engagement. Similarly, there is a need to further understand the psychological and behavioural processes through which active play engagement might reduce screen time (Fan et al., 2022; Hahn & Katzentein, 2024). Furthermore, there is a gap in past research that focuses on age-specific interventions, as young populations differ in screen time habits and developmental needs, therefore suggesting age-specific exploration between screen time and physical activity involvement among children (Christensen, 2021). Lastly, Yang et al. (2023) and Almaqhawi and Albarqi (2022) stated that there is limited exploration of culture as a variable that influences the effectiveness of physical activity involvement in intervening excessive screen time. Following this evidence, further exploration using the grounded theory approach is needed to gather new insights and generate a more in-depth understanding. The psychology of physical activity is also lacking involving the depth coverage of the fundamentals of exercise psychology, from mental health to theories of motivation and adherence to the design of successful intervention for increasing participation based on the theory that can be generated in individuals' experiences.

1.4 Purpose of the Study

This study focuses on middle school-age students' experiences in non-academic sedentary extended screen time and physical activity engagement. The purpose of this research is to propose a framework for physical activity as a possible intervention. Specifically, the objectives are:

- a. To explore the perceptions and experiences of middle school-age students concerning excessive non-academic sedentary screen time.

- b. To explore and analyse the factors influencing excessive non-academic sedentary screen time among middle school-age students.
- c. To explore the underlying factors for middle school-age students' preference for excessive non-academic sedentary screen activities over physical activities.
- d. To design a grounded theory-based framework for physical activity as an intervention to excessive non-academic sedentary screen time.

1.5 Research Questions

This study addresses the following questions:

- a. How do middle school-age students describe their experiences associated with excessive non-academic sedentary screen time?
- b. What are the factors influencing excessive non-academic sedentary screen time among middle school-age students?
- c. Why do middle school-age students choose excessive non-academic sedentary screen time over physical activities?
- d. What are the underlying contextual factors for physical activity as an intervention strategy to excessive non-academic sedentary screen time among middle school-age students?

1.6 Significance of the Study

The literature has provided the links and associations between sedentary behaviour including excessive screen time and physical activity, which is significant for community awareness. Previous literature reported that screen time and physical activity provide a complex association and identified the need to explore the influence of these two behaviours through the participants' context and characteristics. This

study evaluates and generates the process of screen time and physical activity among middle school students. Additionally, interconnections between phases and stages were identified and clearly defined. It provides knowledge and serves as a basis for designing intervention activities to solve the issues concerning this phenomenon. Furthermore, this study offers insights and contributes to the growing body of knowledge in the field of sedentary lifestyle, physical activity, and its possible interventions. This research is important for several reasons, including policy, practical, academic aspects, contextual insights and informing interventions.

1.6.1 Policy

The result of this study provides awareness to the community regarding non-academic sedentary excessive screen time and physical activity engagement. It also serves as a reference for leaders in crafting health programs and policies in their respective communities. The findings can also be used as a basis for planning and designing facilities that can promote active lifestyle.

1.6.2 Practical

This study provides a deeper understanding of screen-related and physical activity concerns for parents with children experiencing the same phenomenon. The findings can help individuals experiencing non-academic sedentary screen time to understand their current situation.

1.6.3 Academic

This research makes a considerable contribution to the body of knowledge pertaining to sedentary behaviour, specifically excessive screen time and its association with physical activity. The concepts and frameworks grounded to the data are limited in this field of interest. This study provides a framework that can serve as a basis for health professionals and exercise/movement specialists in designing a flexible intervention program in counter-measuring the negative health-related effects of extended screen time and its causes as well. Educational leaders and teachers can also benefit from the study by considering it as a reference for possible integration of intervention activities into curriculum and instructions.

1.6.4 Contextual Insights

This study provides profound and contextual insights about the interpretations of middle school-age students to their experiences in gadget exposure and active play engagement. Such exploration identified the underlying perceptions, interpretations, reasons, and context behind middle school-age students' behaviour, which contributes to a better understanding of the phenomenon. Additionally, identifying the connections between generated concepts based on empirical evidence strengthens contextual insights as well.

1.6.5 Informing Interventions

The concepts and insights identified in this study serve as a reference for designing interventions that can balance screen time and physical activity engagement among middle school students and improve their physiological and psychological well-being.

Awareness on the factors influencing gadget use and active play involvement plays a significant role in tailoring the interventions based on the participants' needs.

1.7 Scope of the Study

This study aims to explore non-academic sedentary excessive screen time and physical activity engagement among middle school students in the Philippines. According to Statista Research Department (2021), 73% of the country's population has access to the internet. They also spend an average of 10.27 hours per day engaging the internet on various devices (DataReportal, 2021). Confining the context of this research can help the goal attainment of this study. Schwarzfischer et al. (2019) explored the experiences of middle school-age students (11 to 13 years old) regarding excessive screen time and physical activity engagement and found that the highest decline in physical activity started at the age of 11. Therefore, the present study used the qualitative grounded theory approach to identify concepts and theories that can form a basis for the development of physical activity programs as an intervention for excessive screen time among school students.

1.8 Definitions of Terms

Physical Activity – any movement of the body that requires energy expenditure (World Health Organization, 2018). In this study, physical activity refers to middle school-age students' involvement in organised and unorganised sports and recreational activities.

Screen time – the time spent on screen-based behaviour, such as televisions, computers, smartphones, tablets, and video game consoles (Muppalla et al., 2023;

Tremblay et al., 2017). In this study, this term particularly encompasses the activities done by middle school students in front of gadgets, such as playing video/online games, using social media, surfing the internet, and watching online videos.

Non-academic sedentary screen time – prolonged exposure to screen gadget activities unrelated to any school activity purposes. This behaviour is linked to several health concerns, such as physical, psychological, and well-being issues among middle school-age students (Almaqhawi & Albarqi, 2022; Devi & Sigh, 2023; Manohar et al., 2019; Oliveira, 2019). In this study, non-academic sedentary screen time pertains to recreational and inactive screen use that is not intended for educational or school purposes.

Middle school-age students – students within the range of 10 to 14 years old that are considered as a transition phase from childhood to adolescence (Delgado et al., 2015). In this study, middle school-age students refer to Grade 5 to Grade 8 students within the age range of 11-13 years old.

Grounded theory – a qualitative research method that focuses on the inductive analysis of data grounded from the participants' experiences to generate a theory or model (de la Espriella & Gómez Restrepo, 2020). This study used the grounded theory as a research approach to explore the intended objectives.

Sedentary behaviour - any waking behaviour characterised by an energy expenditure ≤ 1.5 metabolic equivalents (METs) while being in a sitting, reclining, or lying posture (Tremblay et al., 2017). In this study, sedentary behaviour pertains to screen time

engagement among middle school-age students, such as playing online games, social media interactions, and watching videos for entertainment.

1.9 Chapter Summary

This chapter began with a discussion about the background of the study pertaining to physical activity and screen time engagement among the general society. It later presented the current situation of the Philippines being ranked second globally in terms of being inactive (Baclig, 2022) and reviewed the problems anchored to screen time and physical activity involvement among middle school-age students alongside its negative health impact on young populations. This section also justifies the significance of the study by stating its impact on aspects like policy, practical, academic, contextual insights, and informing interventions. Additionally, the scope of the research as well as the research gaps were discussed in this section, highlighting the need for further exploration that considers age-specific to generate in-depth understanding of middle school-age students' screen time and physical activity engagement behaviour (Christensen, 2021).

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