



Faculty of Cognitive Sciences and Human Development

**A STUDY ON THE EFFECT OF DIFFERENT TYPE OF EXERCISE
AND FORMS OF RECOVERY ON STUDENTS' SELECTIVE
ATTENTION PERFORMANCE**

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Final Year Project Report

Masters

PhD

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**A STUDY ON THE EFFECT OF DIFFERENT TYPE OF EXERCISE AND FORMS
OF RECOVERY ON STUDENTS' SELECTIVE ATTENTION PERFORMANCE**

ANIS NATASHA BINTI KATIS

This project is submitted
in partial fulfilment of the requirements for a
Bachelor of Psychology with Honours

Faculty of Cognitive Sciences and Human Development
UNIVERSITI MALAYSIA SARAWAK
(2022)

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ABSTRACT

This study aimed to discover the effect of different type of exercise and forms of recovery on selective attention performance among UNIMAS students whose age level is similar. The research on young adults is neglected when research on attention is primarily focused on children with ADHD even though some research suggests that some components of cognitive function; attention, may begin to deteriorate in early adulthood. Physical inactivity also has been considered a global pandemic that causes multiple diseases besides Malaysia has the highest prevalence of obesity among adults in South East Asia. Hence, this thesis focuses only on young adults regarding their selective attention based on the different types of exercise and forms of recovery. The quantitative approach with a 2×2 factorial between-subject design was done at the Fitness Gym, UNIMAS which included 40 participants and takes 4 days in total. The experiment of the Stroop task for selective attention was implemented and presented online using the PsyToolkit platform and the total reaction time was referred to as the measurement. By using the two-way ANOVA, it indicates that the interaction of those independent variables described that it depends on the exercise that someone wanted to do; which means different exercises required different recovery to maximize or increase the efficiency of selective attention performance. It is hoped that this finding can educate people on a better understanding of how certain exercise benefits cognition besides valuable for the sports and health department to develop policies and programs that focus on improving students' health and physical status.

Keywords: Type of Exercise, Forms of Recovery, Young Adult, Selective Attention, Stroop Task

ABSTRAK

Kajian ini bertujuan untuk mengkaji kesan perbezaan jenis senaman dan bentuk pemulihan terhadap prestasi perhatian terpilih dalam kalangan pelajar UNIMAS yang serupa daripada segi umur. Penyelidikan terhadap remaja dewasa telah diabaikan apabila penyelidikan banyak tertumpu pada kanak-kanak ADHD walaupun beberapa penyelidikan berpendapat bahawa komponen fungsi kognitif; perhatian boleh mula berkurang seawal dewasa. Ketidakaktifan fizikal juga dianggap sebagai pandemik global yang menyebabkan pelbagai penyakit selain Malaysia mempunyai kelaziman obesiti tertinggi dalam kalangan orang dewasa di Asia Tenggara. Oleh itu, tesis ini hanya memberi tumpuan terhadap remaja dewasa berkenaan perhatian terpilih mereka berdasarkan perbezaan jenis senaman dan bentuk pemulihan. Kaedah kuantitatif 2x2 faktorial antara subjek telah dilakukan di Fitness Gym, UNIMAS dengan 40 bilangan peserta dan mengambil masa selama 4 hari secara keseluruhan. Eksperimen Tugas Stroop untuk perhatian terpilih telah digunakan secara maya dengan menggunakan platform PsyToolkit dan jumlah reaksi masa dirujuk sebagai pengukur. Dengan menggunakan ANOVA dua hala, keputusan menunjukkan interaksi antara pemboleh ubah bergantung kepada senaman yang ingin dilakukan, bermaksud lain senaman memerlukan lain pemulihan untuk meningkatkan kecekapan prestasi perhatian terpilih. Hasil kajian ini dapat mendidik pelajar terhadap pemahaman yang lebih baik tentang bagaimana sesetengah senaman memberi manfaat terhadap kognitif di samping membantu bahagian sukan dan kesihatan dalam membina polisi dan program yang tertumpu pada penambahbaikan kesihatan pelajar dan status fizikal mereka.

Kata kunci: Jenis senaman, Bentuk pemulihan, Remaja dewasa, Perhatian terpilih, Tugas Stroop

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter is about the introduction on what the researcher will study for the project. This chapter includes the background of the study, problem statement, conceptual framework, the research objective, research question, research hypotheses, the significant of the study as well as the definition of terms used.

1.1 Background of Study

It is almost 2 years since COVID19 invaded the whole world. This invisible enemies of human, coronavirus is killing us when virus is transmitted through droplets or come directly into contact with the eyes, nose, or mouth and primarily affects those who are in close proximity to one another. Hence, World Health Organization declared a pandemic on 11 March 2020 meanwhile federal government of Malaysia imposed a lockdown known as Movement Control Order on 18 March 2020. During this pandemic, all sectors has been closed except for the essential services and workers need to work from home. Not only working adults has affected from this pandemic but more than 94% of the world's student population also have impacted since the closures of schools, institutions and other learning spaces (Pokhrel & Chhetri, 2021). In this case, students have to go back home or being quarantine at college until next semester break. Unfortunately, wherever the students are during those pandemic situation, there will be no physical classes until further notice but their daily routine remain the same way. Students still need to go through learning unit with lecturers, attend curriculum activities or any seminar from faculty, and updating individual or work assignment as well as communicate with friends through Internet only. When there is no physical classes, hence leads to decrease in the need

for exercise or outdoor activities because of the indoor environmental dominate due to home restriction that contribute to the recent research that the COVID-19 pandemic quarantine had varied degrees of impact on most students' academic performance (Mahdy, 2020).

According to Robinson (2021), Many studies have shown that physical activity has an impact on people's daily lives and mental health. As a result, physical education studies or fitness events such as marathons, sports days, or sports talks are held all over the world, from preschool to kindergarten to colleges, in order to promote student health and learning efficiency. Unfortunately, finding techniques to enhance health and study or work efficiency is difficult: researchers must consider a number of potentially interrelated aspects, including sex, age, environment, and living conditions, as well as evaluate historical data and investigate useful technology. People are gradually paying more attention to their own health and personal growth in order to realize their full potential and improve their efficiency in terms of job and learning, as a new illness has spread unexpectedly and destroyed human quality of life. In addition, the advancement of mobile devices has had an impact on people's lives. This is because healthy lifestyle can be monitored using a high-tech wearables watch that come with sensors which reliably collect data such as heart rate, ECG reading as well as hours of sleep and are now extensively used with a variety of functions depending on the brand. As a result, it is now possible to examine human activities more readily and accurately. People have become closer as a result of the development of mobile technologies that use the Internet. The world is narrowing, and practically everyone can now communicate via a mobile phone or a smart watch. As a result, for both objective and subjective causes, people have become more sedentary.

The help of emerging technology such as smart watch that have sensors to collect and record information about daily activity, it would be easy to do physical exercise such as cycling, walking, swimming and others. This is because physical activity plays an important part

especially during young adulthood as it is one of the most fundamental human needs to maintain our body health which later can contribute to healthy mind. Encouraging healthy habits in children and teenagers is crucial for their development while growing up. Childhood lifestyles are more likely to be carried over into adulthood besides some modifications may be more difficult to implement as a person matures. Gordon Larsen et al (2007) stated that there is solid evidence that physical activity benefits children and teenagers by improving their health through metabolic and cardiovascular health biomarkers, bone health, cardio respiratory and muscular fitness as well as cardio respiratory and muscular fitness.

Inject the thrilling of different protocols of exercise such as the type of exercise; aerobic, flexibility, strength, balancing, hours of exercise as well as post-exercise recovery among young adult who still study in bachelor degree because it is crucial for them to take physical exercise as a daily or weekly routine in order to improve attention performance especially in selective attention which they need to process the directing consciousness towards related stimuli while avoiding unrelated ones in the environment for prolonged use and it is significantly reduce the risk of developing attention disorder in later adulthood. Undergraduate students really needs to aware the importance of exercise because it relates to their central organ in nervous system, brain. A young adulthood stage is a developmental stage that everyone experiences which generally defined as when a person is at his or her 18 to 25 years old. This is a critical phase where many psychological and biological changes in life occur. According to Elizabeth Millard (2020), those who exercised consistently during young adults functioned much better on endurance and strength than those who choose to ignore doing exercise throughout adolescence stage.

In young adulthood which a person has more energy to do heavy exercise such as walking in moderate to high intensity for 30 minutes, it shows that it will generate new hormones such as dopamine, serotonin, endorphins that play vital roles in emotions, thinking, attention, concentration, block out distractions and focus on the task at hand (Abu Bakar, 2018). The release of hormones provide an environment for the growth of brain cells and expansion of the brain's network of blood vessels. According to Woon and Zakaria (2019), the prevalence of adult Attention Deficit Hyperactive Disorder was 15.8% and the persistence rate was 63% in Malaysian forensic mental hospital. For the selective attention, distraction has surpassed drunk driving as the leading contributory factor in Malaysia. A split-second break in focus while reading a text or answering a phone call can end in a fatal crash. (New Straits Time, 2016). Any age group can face this kind of situation however those who consistently do exercise may reduce the effects of less concentration besides aging because the activation of the machinery necessary for DNA repair contrary with a person who physical inactive will lead causes of cardiovascular diseases, diabetes, obesity (Seegert, 2021).

Malaysia has the highest rate of adult obesity in South East Asia, with 50.1 percent of our adult population being overweight, 30.4% or obese 19.7% in 2019 findings ("Obesity in Malaysia", 2021). This statement showed that Malaysian people especially adults loves to eat yet did not focusing on living a healthy lifestyle or exercise to burn out the calories. If there is so, human's attention may slowly reduce and have an impact towards lives because there is a report stated that physical exercise has beneficial effects on cognition and attention as well. Therefore, this study will focus on the effect of different type of exercise and form of recovery on students' selective attention performance.

1.2 Problem Statement

The coronavirus disease 2019 (COVID-19) pandemic had a significant negative influence on global economic and social life. It is indeed had a negative impact on people's overall health and quality of life. Physical inactivity has been considered a global pandemic since 2012, having 28 percent of the worldwide people, or 1.4 billion people, being physically inactive (Kohl., 2012). Physical inactivity is one of the primary causes of cardiovascular disease, diabetes, obesity, and early mortality around the world, therefore this scenario is quite concerning (Guthold, Stevens, Riley & Bull, 2018; Moker, Bateman & Kraus, 2018; Siordia, 2020). As Malaysia has the highest prevalence of obesity among adults in South East Asia, this could happen because people are lacking of knowledge as well as awareness about the benefits of physical activity or exercise towards a healthy lifestyle. As a consequence, if the population's physical activity levels begin to deteriorate throughout this period of physical barriers, public health departments will face an even harder task, as this condition could significantly affect the pandemic scenario even further, as diabetes, obesity, hypertension, and other comorbidities related to physical inactivity can deteriorate the COVID-19 prognosis (Siordia, 2020). Existing exercise knowledge taught in high school during Pendidikan Jasmani dan Kesehatan or course mates who active in sports may help students to improve their exercise habits and influence their attitudes towards better and healthy mind. Moreover, undergraduate student really need to sharpen their knowledge for the effect of exercise on cognition or in this study, selective attention since there is very rare and only little to see sports course as an elective course in university.

For decades, researchers have been interested in the association between physical activity and cognition (Kallo & Rassovsky, 2017). Despite the fact that there is a significant association between aerobic exercise and cognition in children aged 7 to 16, no research on the relationship between aerobic exercise and cognitive performance in university students has been published (Palmer et al., 2013). This shows that it is significantly less study research has been considered the effects of different type of exercise and form of recovery on young adults' selective attention performance compared with plentiful publications on exercise intensity level for cognitive performance.

One of the difficulties that students face in both physical and online lectures is sustaining their attention on the subject. The online learning environment hosts both synchronous and asynchronous sessions. Synchronous meetings are held in online classrooms provided by most universities using tools like Zoom or Microsoft Teams. Professors may need a video broadcast so that students can provide feedback on the study tool's shortcomings, as well as any arguments or questions they may have. (Deng & Wu, 2018b). Nevertheless, this statement would not change anything to the students attention performance if there is no action taken. According to several studies, exercise and fitness can increase cognitive function such as attention in children, young adults and older adults (Budde et al., 2012). But in spite of that, there are limited studies on physical activity or exercise topics especially in Asia, specifically in Malaysia.

According to the Centers for Disease Control and Prevention (2016), 6.1 million (9.4%) children have been diagnosed with ADHD at some point in their lives. There are no more latest numbers available, but they are likely to be higher. The data is actually astounding, despite the fact that it is six years old. Apparently children are being over diagnosed with ADHD when, in truth, they are not getting enough physical activity (Steeves, 2014). However, research on

young adult is neglected when research on attention is mostly focus on children with ADHD even though some research suggests that some components of cognitive function, such as attention, may begin to deteriorate in early adulthood (Loprinzi & Kane, 2015). Consequently, the lack of research on different type of exercise and forms of recovery on selective attention among young adult in the country lead to this research study. The findings will be explained further in chapter 4.

1.3 Research Objectives

1.3.1 General Objective

The main objective of this study are (a) to investigate the difference in selective attention performance of different type of exercise, (b) to examine the difference in selective attention performance of different forms of post-exercise recovery, c) to test whether different exercise and post-exercise recovery type have an interaction effect on selective attention performance.

1.3.2 Specific Objectives

1. To investigate a significant difference in selective attention performance of aerobic and strength exercise
2. To determine a significant difference in selective attention performance of active and passive post-exercise recovery
3. To investigate the interaction effect between aerobic-strength exercise and active-passive post-exercise recovery on selective attention performance

1.4 Research Questions

1. Are there any significant differences in selective attention performance of aerobic and strength exercise?

2. Are there any significant differences in selective attention performance of active and passive post-exercise recovery?
3. Are there an interaction effect between aerobic-strength exercise and active-passive post-exercise recovery on selective attention performance?

1.5 Research Hypotheses

The null hypotheses for the research questions are:

H0 question 1: There is no significant difference in selective attention performance of aerobic and strength exercise

H0 question 2: There is no significant differences in selective attention performance of active and passive post-exercise recovery

H0 question 3: The effect of exercise type on selective attention performance does not depend on the effect of the post exercise recovery type, hence no interaction effect

1.6 Conceptual Framework

The goal of attaining an understanding of the effect of different type of exercise and forms of recovery has been achieved through a development of this conceptual framework that guided the study until does not deviate from the original. For this research, there are two independent variables with two levels each. The first independent variable is type of exercise, that contains aerobic and strength exercise while second independent variable is forms of recovery that is made up of active and passive recovery. The dependent variable for this study is selective attention performance have on pre-university and undergraduate students of University Malaysia Sarawak.

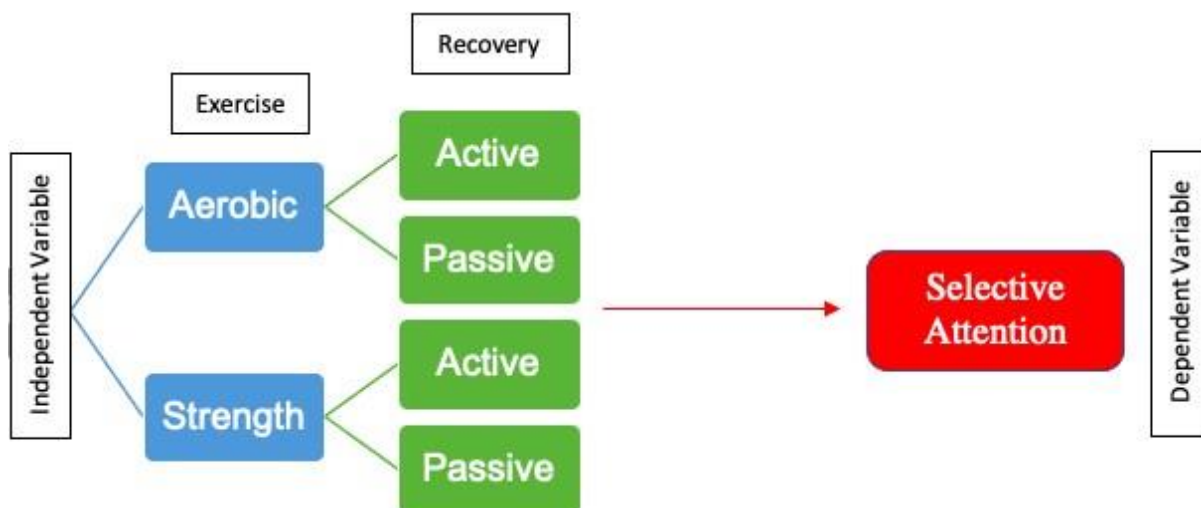


Figure 1: Conceptual Framework

1.7 Significance of Study

Given the limited studies and research in this area in Malaysia, and due to the highest prevalence of obesity among adults in South East Asia, more research is required in this area. By exploring various type of exercise together with the right match of recovery type, it will enhances awareness of its seriousness as well as interest in sports at university, especially among young adult students. They also will be able to grasp better understanding on how certain exercise benefits to cognition after completing this study which will make them spend more time on physical activity than online digital such as games, lives on social media and so on. The data gathered from those participants, young adult students in UNIMAS will add a knowledge with empirical evidence to existing knowledge of the current state of exercise to the researcher. Besides, the results will be valuable for sports and health department to develop policies and programs that focus on improving students' health and physical status. Malaysian or outsider practitioners would benefit from this study as well because they can use as a reference for future studies.

1.8 Definition of Terms

1.8.1 Exercise

Conceptual Definition: Exercise is the training of the body to improve its function by increasing the heart rate beyond resting levels and enhance its fitness which it is an important part of preserving physical and mental health (Blair, 2021). There are 4 main types of exercise; aerobic, strength, balancing and flexibility

Operational Definition:

Aerobic exercise: Row for 30 minutes using a rowing machine that has been program to “10” setting which allows the most airflow to get the highest resistance which indicate moderate intensity level.

Strength exercise: A set of five exercises for 9 minutes total time of exercise with 1 minute intervals in between.

1.8.2 Post-exercise recovery

Conceptual Definition: It is an actions carried out immediately after exercise and encompasses a series of post-exercise steps that are necessary for any exercise programme, regardless level of fitness, sort of physical activity, or intensity of exercise. Stretching, warming up, consuming certain drinks or foods, as well as therapeutic acts, are all examples of recovery

Operational Definition:

Active recovery:

Aerobic exercise – Row for 30 minutes using a rowing machine that has been program to “5” setting which permits little airflow and minimizes resistance which indicate low intensity level.

Strength exercise – One lap around a track