DETERMINANTS OF ADOPTION INTENTION OF WEARABLE HEALTHCARE DEVICES AMONG GENERATION Z IN MALAYSIA

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

TAM	Technology Acceptance Model
HBM	Health Belief Model
PU	Perceived Usefulness
PEOU	Perceived Ease of Use
HB	Health Belief

LIST OF APPENDICES

PREFACE

The Final Year Project is important and must be completed by every student of Bachelor of Business Administration (Honours) Healthcare Management. The title of this research is ‘‘Determinants of Adoption Intention of Wearable Healthcare Devices among Generation Z in Malaysia’’. This study seeks to identify and analyze the determinants influencing the adoption intention of wearable healthcare devices among Generation Z in Malaysia.

In an era where technology seamlessly integrates into daily life, wearable healthcare devices have emerged as a powerful tool for monitoring and improving health. Generation Z, known for their digital savviness and health consciousness, represents a critical demographic in the adoption of wearable healthcare devices. However, despite the potential benefits of these devices, understanding the factors that drive or hinder their adoption among this demographic remains crucial.

By exploring the variables such as perceived usefulness, perceived ease of use and health belief, this study aim to provide a comprehensive view of the factors shaping their adoption behavior. The insights gained from this research are expected to contribute valuable knowledge to the field of healthcare technology, providing a foundation for future studies and helping the industry stakeholders tailor their strategies to meet the needs of this emerging market segment. Furthermore, the research findings will also have implications for government, manufacturer and healthcare providers, who aim to promote the adoption of wearable healthcare devices, ultimately contributing to improve the health outcomes and well-being of Generation Z in Malaysia.

ABSTRACT

This study is aimed at investigating how the influencing factors which are perceived usefulness, perceived ease of use and health belief can affect the adoption intentions regarding wearable healthcare devices among Generation Z in Malaysia. By reading through the previous studies which have shown that the influencing factors on adoption intention of wearable healthcare devices, we found that there are insufficient relevant research which focuses on Generation Z in Malaysia. Our research purpose is to examine the relationship between the influencity of the perceived usefulness, perceived ease of use and health belief and willingness to use wearable healthcare devices among the young Malaysian. A quantitative approach was employed, using a non-probability sampling method to collect data from Generation Z respondents through social media platforms. A pilot study has been conducted with 30 respondents before the actual distribution of the questionnaire to examite the reliability of the questionnaire.There are total 391 valid responses obtained through all Malaysia's states and have been used to analyse the data. The respondents are requested to provide their demographic information as well as their perceivetion on the question. The SPSS software has been used to test the obtained data for reliability while the Multiple regression analysis was used to examine the influence of perceived usefulness, perceived ease of use, and health motivation on adoption intention. The findings reveal that all three factors significantly and positively influence the adoption intention of wearable healthcare devices, the results are in line with the previous studies which proposed these three independent variables as the affecting factors of the adoption intention. Not only that, this research contributes to the existing body of knowledge by focusing on Generation Z, it can offer insights into their healthcare technology adoption behaviors. Additionally, it provides a fresh theoretical perspective that could inform both academic research and industry practices in the context of wearable healthcare technology. Furthermore, the policy maker are also able to formulate relevant law and regulations to avoid any data abuse happening.

Keywords: Wearable healthcare devices, Generation Z, Malaysia, Perceived usefulness (PU), Perceived ease of use (PEOU), Health belief (HB), Adoption intention.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

The first chapter of this research will outline the aims of exploring the adoption intentions of wearable healthcare devices among Generation Z in Malaysia. Chapter 1 will be discussing the research background, problem statement, research objectives, research questions, and significance of the study.

1.1 Research background

Wearable healthcare devices refer to the electronic and computerized components that had combined into different type of accessories that allow the user to wear it without discomfort feelings (Wright & Keith, 2014), and it can be designed as wristbands, smartwatches and wearable mobile sensors (Hayat et al., 2022). Conrick (2021) defined wearable healthcare devices as specialized wearables that possess functions such as monitoring the user's vital signs and activity as well as more advanced functions based on the capabilities of the device. Wearable devices are equipped with integrated sensors to monitor body movements, offer biometric recognition, or aid in location tracking (Yasar & Wigmore, 2023).

The study by Canali et al. (2022) highlighted the core functions of wearable healthcare devices, including monitoring, screening, detection, and prediction. Monitoring serves as the major function of a wearable, it is a process of continuous data collection from a specific group of people or individuals. Since the wearable is designed as a comfortable accessory, it is the most ideal tool to continuously collect the data from the users (Canali et al., 2022). The research undertaken by Khakurel et al. (2017) has shown that the

majority of users use it for monitoring purposes. Screening involves the recognition or identification of specific conditions through the data collected during monitoring. Detection is the function related to screening, it typically involves identifying a specific condition of an individual or population and alerting the users when the condition is detected. The fourth function is prediction, which involves foreseeing future trends or events of an individual or population based on continuous monitoring (Canali et al., 2022).

To date, smartwatches are considered as the most common type of wearables (Yasar & Wigmore, 2023), it has utilized by the user to support health, wellness, and fitness. These devices typically offer the ability to sync with smartphone apps, store and manage information on the user's physical and mental status, monitor sleep patterns, track calories consumed and burned, and record distance traveled (S. M. Lee & Lee, 2020). In 2022, consumer-grade wearable healthcare devices such as smartwatch, held the largest portion of the wearable healthcare devices market compared to the clinical-grade wearable healthcare devices (MarketsandMarkets, 2024). According to the Global Wearable Sensors Market Size Industry Report (2018-2025), the expand of global market for health and fitness monitoring applications is driving the growth of the smartwatch market. The report also mentioned that sensors play a crucial role in wearable devices because users now are prioritizing tracking real-time motion-sensing activities (Zukri, 2020). In the US, most consumers purchase wearable devices primarily to monitor their daily activities (Statista, 2022).

Wearable healthcare devices have become a trend in Malaysia, with the number of wearable healthcare users reaching 1.6 million at the end of 2022. The Fitness-Tracker market in Malaysia is forecasted will reach a revenue of US$165.70m by 2024 (Statista, 2024). Among Malaysian consumers, 65% actively use wearable devices for both fitness and healthcare purposes (Hayat et al., 2023). According to the Asia-Pacific Health Priority Survey, Covid-19 outbreak had made 79% of Malaysian respondents more concerned on their health, and 75% of them were willing to raise their expenditures related to health and wellness (The Sun, 2023).

With the rising adoption of wearable healthcare devices and the growing health consciousness among Malaysians, it is essential to explore the determinants that can influence their intention to use such devices, particularly among the younger generations. In Malaysia, Generation Z comprises 25% of the overall population, they are the first generation to have been exposed to digital technology since their early childhood (Tjiptono et al., 2020). Generation Z refers to the people who were born between 1996 and 2012. Sometimes, they are also called I-generation, digital natives because they were born and grew in an era where access to the web, internet, technology, and digital media is readily available (Turner, 2015). Their lives are closely tied to social media and related products and services since they have grown up in a time when technology is rapidly developing (Tjiptono et al., 2020). However, in the Nor et al. (2022) study on coronary artery disease (CAD) among Malaysian youth, findings indicated that 43.7% of the participants was either obese or overweight, 70% of the participant possess at least one cardiovascular risk factor. By examining the factors affecting Generation Z's intention to adopt wearable healthcare devices, stakeholders can obtain valuable insights to design an effective strategy to promote the adoption of these technologies.

1.2 Problem statement

Among the generation of people who are grouped by young adults and teenagers, Generation Z is the youngest population who were born between 1996 and 2012 (McKinsey & Company, 2023). This generation grew up in a keep changing world and faced unexpected events such as a shifting financial landscape, and COVID-19. Their characteristics have been shaped by the external environment to various types, but most of them have the same characteristic which is familiar in modern technology. The Generation Z is considered as the first digital natives because they have grown and lived surrounded by digital technology such as social media, smart devices internet and so

on, the use of digital technology have become a part of their daily routines (Iivari et al., 2020). Tjiptono et al., (2020) contended that Generation Z is tech-savvy and quick to adapt to new developments in technology. Similarly, Tjiptono and Kowalska (2012) stated that the young generation was grown up in the digital era and greatly influenced by the advancement of technology throughout these years (Kowalska, 2012). As such, it is not surprising that Generation Z could be considered as having higher tolerance and acceptance in new technology as compared to the other generations.

In spite of their high adoption of technology, Generation Z is not far ahead in the proportion of users of wearable healthcare devices in the market as expected. There was a report which investigated the ownership of wearable technology in Malaysia in 2022, the researcher have allocated the respondents into three parts which are the smartwatch users, the fitness or activity tracker user or both the smartwatch and fitness or activity tracker user (Statista, 2022). In accordance with the result, up to September 2022, among the three parts, most wearers of the wearable technology in Malaysia are between the ages of 25 to 44. The ages group between 25 to 44 can be separated into two generations which are Generation Z with current ages of 12 to 27 and millennials with current ages of 28 to 43. Based on the statistics, it has shown that most of the smartwatch wearers are falling into the millennials, not the Generation Z as expected.

There are some factors that influence the intentions of young people in adoption of wearable healthcare devices indicated by plenty relevant studies. By reading through the previous studies, the 3 factors that most rapidly be mentioned are perceived usefulness, perceived ease of use and health belief.

Perceived usefulness (PU) is known as the degree of a person feels that using a specific technology would be advantageous (Worthington, 2021). It can be interpreted as the definition of the word useful: “able to be effectively utilized” (Davis, 1989). When the PU of an individual toward wearable healthcare devices increases, it will rise the intention to utilize the wearable healthcare devices. In compliance with the research of Zhang et al., (2017), the finding has shown that the PU has positive influence on the intention in adopting wearable healthcare devices. Agreed with that, Dutot et al. (2019) found that adoption of smartwatches is largely dependent on the users’ PU. Consumers

view smartwatches as fashnology, which combines fashion and/or technology, so the smartwatch is very attractive and useful for them. Moreover, Cheung et al. (2019) has also found that there is a significant impact of PU on consumer's adoption to wearable healthcare devices. The further study by them in 2020 also proved that the PU significantly improves Gen-Z consumers' AI for wearable healthcare devices (Cheung et al., 2020).

Perceived ease of use (PEOU) refers to the degree of a person thinks using a specific system or item for specific purpose would require less or no work at all (Davis, 1989). In some previous studies, the perceived convenient (PC) was considered to have the same meaning as PEOU. Chau et al., (2019) stated that the PC is similar to PEOU, and they chose PC as one of the independent variables of adoption intention of wearable healthcare devices. Cheung et al., (2019) stated that the wearable healthcare devices will assist them improving their health-related behaviour as well as provide tailored exercise plan after evaluating their performance in exercises if the consumers provide their health status related information. In short, wearable healthcare devices are easy and convenient for the consumer to maintain their health status, it looks like the combination of PEOU and PC. However, in the further study of them in 2020, they found that the influence of PEOU on adoption intention of wearable healthcare devices is quiet less than the other independent variables applied in the research which are perceived usefulness and perceived credibility.

Health belief (HB) is originating from the Health Belief Model (HBM), which refers to consumers' personal beliefs about the efficacy of specific behaviours in enhancing their health status are referred to as health beliefs (Cheung et al., 2019). The researchers have examined the HB as the influence of consumer's intention to accept wearable healthcare devices, them they found there was a positive relation between them (Chau et al., 2019). This finding can be explained as when the consumers are actively seeking methods to improve their health due to the stronger belief in health, they perception of wearable healthcare devices is reinforced and make them more likely to have deep understanding on the wearable healthcare devices. Cheung et al. (2019) has also found that there is a notable impact of HB on consumer's adoption to wearable healthcare devices.

Although Generation Z has been called digital natives, there remains a gap in studies concerning their adoption intentions towards wearable healthcare devices. A similar study was conducted in Malaysia, however, the research by Hayat et al. (2022) did not concentrate on a specific demographic and only included a partial representation of Generation Z. Afternatively, there was much research conducted in other countries, such as India, Hong Kong, and Nigeria (Nayak et al., 2021; Cheung et al. 2020; Ezurike, 2023). In short, there were inadequate studies that focus on the reasons influence intention in using the wearable healthcare devices among the Generation Z in Malaysia. Hence, this study aims to address the limitations and fill the gaps identified in previous research within this field by investigating the factors that affect the adoption intention of wearable healthcare devices among Generation Z in Malaysia.

1.3 Research objective

1.3.1 General objective

The main goal of this study is to examine the adoption intentions regarding wearable healthcare devices among Generation Z in Malaysia.

1.3.2 Specific objective

1. To examine the relationship between perceived usefulness and adoption intention of wearable healthcare devices.

2. To evaluate the relationship between perceived ease of use and adoption intention of wearable healthcare devices.

3. To determine the relationship between health belief and adoption intention of wearable healthcare devices.

1.4 Research Questions

The research tries to answer the following questions:

- Does perceived usefulness relate to the adoption intention of wearable healthcare devices?
- Does perceived ease of use relate to the adoption intention of wearable healthcare devices?
- Does health belief relate to the adoption intention of wearable healthcare devices?

1.5 Significance of the Study

1.5.1 Theoretical Contribution

To date, there remains a significant gap in the literature regarding the reasons for the lack of information on the use of wearable healthcare devices among young people, particularly in Malaysia. The focus of many existing studies on users of wearable healthcare devices tends to be primarily on the elderly population, as demonstrated by research conducted by Li et al. (2019), Zhang and Shahriar (2020), and Ahmad et al. (2020). Moreover, studies on wearable healthcare devices are still relatively new in the literature (Cheung et al., 2020).

Moreover, according to Tjiptono et al. (2020), Generation Z consists of 25% of the total population, representing the largest age group in Malaysia. As such understanding the determinants of their purchasing intention is essential and this would be able to provide some valuable addition to the existing consumer behaviour and healthcare-related literature. Therefore, it is crucial to investigate why Generation Z is less engaged with wearable healthcare devices in Malaysia. This study seeks to address this gap by investigating these factors comprehensively. Thus, it will provide a deeper understanding of the issues faced by Generation Z when it comes to adopting wearable healthcare devices. Next, by delving into this research gap, we contribute to the existing literature by providing a comprehensive analysis of the factors influencing the adoption of wearable healthcare devices among Generation Z in Malaysia. The findings of this study have the potential to improve interventions and initiatives targeted at expanding the usage of wearable healthcare devices among Generation Z, thereby advancing knowledge in the field of wearable healthcare devices and encouraging better lifestyle choices.

1.5.2 Practical Contribution

This study also holds significant practical contributions for various stakeholders, including manufacturers and marketers of wearable healthcare devices, policymakers, and individual consumers. Therefore, our investigation into the factors influencing adoption intention among Generation Z contributes to a broader understanding of technology adoption decision-making processes.

First, this research will provide **manufacturers and marketers** with crucial insights into the preferences and concerns of the target consumer population, especially Generation Z. By recognizing the key variables of adoption intention, marketers can effectively tailor their product offerings and marketing

strategies to satisfy the needs and preferences of young consumers. For example, the manufacturers might prioritize features that improve perceived ease of use and usefulness, thereby increasing the likelihood of adoption among Generation Z.

Additionally, **policymakers** can benefit from the insight generated by this research in formulating policies and initiatives aimed at promoting the adoption of wearable healthcare devices among the younger population. By understanding the underlying factors influencing adoption intentions, policymakers can design targeted interventions to address barriers and facilitate increasing adoption of these devices, ultimately fostering public health and well-being.

Moreover, **individual consumers** stand to benefit from this study as well. Understanding the factors that influence their personal adoption and usage behavior allows them to make better decisions about whether and how they should integrate wearable healthcare devices into their daily lives. Next, consumers may evaluate the compatibility of these devices with their lifestyle, preferences, and health goals, thereby making more informed choices regarding their adoption. This research also enables individuals to take control of their health and well-being, potentially leading to positive behavior changes and improved health outcomes over time.

1.6 Chapter Summary

In conclusion, this chapter provides a complete explanation of our research objective. The purpose of our study is to investigate the adoption intentions regarding wearable healthcare devices among the generation Z in Malaysia. The chapter provided a comprehensive overview of the study, including the background and objectives. The identified factors impacting adoption of generation Z in Malaysia to wearable

healthcare devices have been discussed in this chapter. Subsequently, Chapter 2 will present a detailed literature review related to our research topic.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

In this chapter, the theoretical models relevant to this study will be discussed in the first part. Second part of chapter two will discuss the literature review of the dependent variable and independent variable. The third part will be the proposed conceptual framework and the fourth part explains the hypotheses. The last part will summarize the content in this chapter.

2.1 Underlying theories

2.1.1 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is introduced by Davis (1989), is the most widely recognized research model for forecasting the utilization and acceptance of information systems and technology among individual users (Surendran, 2012). Based on the study of Nur and Panggabean (2021), TAM was derived from the Theory of Reasoned Action (TRA) by Davis, and it is better in explaining individual's intention to use certain technologies than TRA or Theory of Planned Behavior (TPB). TAM employs Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as the explanatory variables to explain a user's willingness to adopt and intention to persist in using a certain technology (Ahmad et al., 2020).

PU defined as “the extent to which an individual believes that utilizing a specific technology would improve their job performance”. In contrast, PEOU refers to “the extent to which an individual believes that utilizing a specific technology would involve minimal effort” (Davis, 1989). Cheung et.al (2021) suggest that both PEOU and PU significantly influence consumers' intention to adopt technology products. According to TAM, if the user finds the technology or service is simple to use, they will develop a perception that the technology is useful. Hence, their attitude towards adopting technology becomes positive (Kalantari, 2017). The study conducted by AlQudah et al. (2021) revealed constructs of TAM were widely employed in understanding the acceptance of technology in healthcare. Empirical research utilizes the TAM to examine consumers’ adoption intention across different contexts, such as internet acceptance, digitalized banking, and adoption of e-books (Han & Ji, 2021; Suhartanto et al., 2019; Mizher & Alwreikat, 2023).

However, TAM has the problem of reliably quantifying behaviour in an observed investigation. Measuring actual behaviour is difficult due to various subjective factors such as values, norms, individual traits, etc (Malatji et al., 2020). As the TAM overlooks the impact of social factors on an individual's decision to adopt technology, this model may only be suitable for application within organizational or workplace settings (Taherdoost, 2018). Therefore, our study will modify TAM model with other variables to understand the adoption intention of wearable healthcare devices among Generation Z in Malaysia.

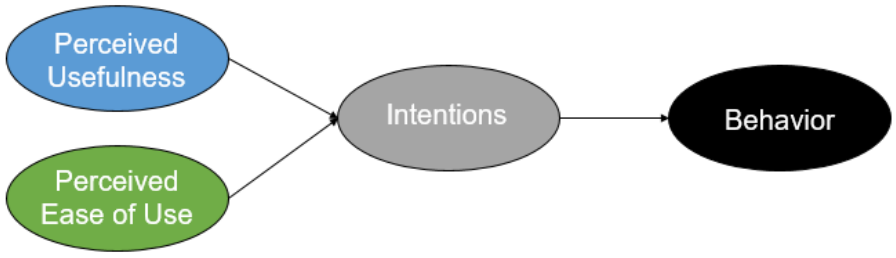

Figure 2.1.1. Technology Acceptance model. Adapted from Worthington, A. K. (2021, May 30). *Technology Acceptance model*. Pressbooks.

https://ua.pressbooks.pub/persuasiontheoryinaction/chapter/technology-acceptance-model/

2.1.2 Health Belief Model (HBM)

The Health Belief Model (HBM) is a theoretical framework that specially developed to explain and forecast health-related behaviors (Rosenstock, 1974) . HBM was established by social psychologists from the US Public Health Service, originally created to understand why people lack participation in preventative and early detection initiatives (Rosenstock, 1974). Next, the HBM underscores that an individual's beliefs have a significant impact on influencing their health-related behavioral pattern (Ross et al., 2010, as cited in Chau et al., 2019).

As mentioned by Chau et al. (2019), the HBM consists of four primary structures which include perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. These constructs have the potential to shape individuals' intents and motivations about health (Lee & Lee, 2020). First, the concept of perceived susceptibility relates to an individual's assessment of their risk or possibility of developing a specific health condition or illness (Skinner et al., 2015). For example, individuals who believe themselves are susceptible to a health issue are more likely to engage in behaviors targeted at preventing or managing the condition. Second is perceived severity, which is refers to an individual's viewpoint of the severity of a health problem and its potential consequences (Zhang et al., 2017). People are more inclined to treat a health condition than they perceive is more serious.

Third, perceived benefits mean an individual's perception in the effectiveness of a specific health-related practice or behavior in lowering the likelihood of sickness (Skinner et al., 2015). For instance, if a person believes that a particular action may lower their vulnerability to or severity of a health concern, they are

more likely to engage in that behavior. The fourth element is perceived barriers, which refer to the expenses associated with a given health-related behavior (Zhang et al., 2017). Barriers can include practical reasons like time, money, or inconvenience, as well as psychological concerns like fear or self-efficacy (Skinner et al., 2015). As a result, the presence of perceived barriers might hinder behavior change.

In the realm of wearable healthcare devices, individuals who recognize that their improper health practices are harmful to their well-being are motivated to adopt wearable healthcare devices to better manage their health activities (Cheung et al., 2019). In agreement with Zhang et al. (2017), we integrated the Health Belief Model (HBM) with the Technology Acceptance Model (TAM) in this research to develop a new construct, which is health belief. This variable was identified as a significant factor in consumers' adoption of wearable healthcare devices.

In short, the HBM provides a comprehensive framework for understanding the factors influencing their decision-making process in exploring the adoption intentions of wearable healthcare devices among Generation Z in Malaysia. This understanding is crucial for healthcare providers, policymakers, and technology makers seeking to improve the health and well-being of this demographic. As a result, this insight facilitates the development of targeted interventions and strategies aimed at fostering their acceptance and adoption.

2.2 Review of variables

2.2.1 Dependent Variable: Adoption Intention of Wearable Healthcare devices

Adoption is the process of becoming a product's user, the consumers can find out whether a product is practical and useful for them so they will keep on using it for an extended period of time (What Is Product Adoption? 2023). Intention means the tendency of a person to pay for and use the product or service (Bagozzi, R. P., & Burnkrant, R. E.,1979).

Adoption intention is known as the degree to which customers use and accept the new products or technologies before other members of the same social system (Rogers, 1962). Rogers (1962) has created the Innovation Diffusion Theory (IDT) which stated that adoption is the action of choosing fully utilizing technological innovation as the best available option. However, the adoption intention of new products or technologies were influenced by few elements of the innovation. Among these elements, the relative advantage plays a vital role for adoption (Rogers, 1962). Relative advantage indicates that which an innovation is thought to be superior to the previous concept it replaces (Scott et al., 2008). Agree with that, Greenhalgh et al. (2004) declared that an innovation will not be adopted if the user cannot see any relative benefits from using it. In short, the more obvious benefit of using the innovation compared to old strategy, the more readily adopted and implemented it. Moreover, complexity also play crucial role in for adoption (Rogers, 1962). Complexity indicates the level of difficulty in understanding and adopting the new technology (Scott et al., 2008). The lower degree of complexity, the easier adoption of the new technology.

Not only that, in order to achieve adoption, the adopter must view the concept, action, or product be viewed as new or innovative (Granić, 2023). Before the consumers purchase the new products or technologies, they must have tried it and accept it. Granić (2023) stated that the acceptance to technology is the primary step of adoption of technology, a person's attitude toward technology determines whether they will adopt it or not. In a word, the higher degree of acceptance, the higher adoption intention of the new products or technologies.

In the present study, the adoption intention of wearable healthcare devices refers to the intention of consumers to understand the benefits of wearable

healthcare devices and use it to make life easier. The understanding of the adoption intention of consumers is very important to create a satisfying product as well as increase the use of the product in the market.

2.2.2 1st Independent Variable: Perceived Usefulness

According to Davis (1989), perceived usefulness (PU) refers to "the degree to which a person believes that using a specific technology will improve performance". Furthermore, Adams et al. (1992) defined PU as "how much a person believes using a specific system will enhance their job performance". In an organizational setting, a system considered high perceived usefulness is one where the users hold the belief that adopting and utilizing the system will result in favourable outcomes that enhance their job performance and productivity (Yusoff et al., 2009). In this research, PU will be identified as the degree to which an individual believes using a wearable healthcare device would either maintain or improve their health status.

People perceive a technology as useful if it helps them to save time and reduce effort required to operate (Yang et al., 2022). PU recognized as a key factor in determining individual's intentions to use information technology (Chuah et al., 2016). The research conducted by Lee et al. (2013) also highlighted that PU has been established as a factor that shapes user attitudes towards technology, while also directly influencing an individual's intention to persist in using information systems over an extended period. When the users believe that the use of information technology devices will provide advantages and enhancement to various aspect of their live, those anticipated benefit become a motivate their desire the information technology devices (Cheung et al., 2019). The study conducted by Dhingra and Mudgal (2019) revealed that PU exerts a positive and significant influence on the adoption of internet banking services,

concludes that enhancing the PU of internet banking offerings can lead to an increase in the number of users embracing and utilizing such services.

Similarly, individuals who recognize the advantage of using wearable devices for healthcare are more inclined to adopt wearable healthcare devices (Bianchi et al., 2022). Cheung et al. (2020) reveals PU significantly influences the adoption of AI wearable healthcare devices among Generation Z consumers. Huarng et al. (2022) conducted PU emerged as a predictor of technology acceptance across various research domains.

2.2.3 2nd Independent Variable: Perceived ease of use

According to the Cambridge Dictionary (2024), perceived means an individual observe something that is clear or possess a conviction regarding something. Perceived ease of use (PEOU) is generally described as "the degree of an individual thinks that a specific system would require no work at all" (Davis, 1989). It was pointed out in the Technology Acceptance Model (TAM) which stated that individual's intention to use the technology can be predicted by some determinants, PEOU is one of the determinants. In short, the PEOU in TAM can be defined as the degree of believing the technology is easy to use.

In the past studies, there were many researchers have proved that the PEOU has significantly impact on the acceptance and intention to adopt the technology products. A study from Hokroh and Green (2019) has investigated the online video games adoption among the Saudi users and the result has shown that the attitude toward using video online games was significantly influenced by PEOU and perceived usefulness (PU). Not only that, Ge et al. (2020) have examined the factors affected the learning persistence in massive open online courses (MOOCs), which is an online learning platform. They found that the PEOU is

one of the factors that directly and positively affected the learning persistence in MOOCs among the users.

Zhang et al. (2022) have conducted research on the impact of national culture on adoption intention in wearable healthcare devices by using meta-analysis. They found that the PEOU has strong relationships with adoption intention of wearable healthcare devices among the respondents. They stated that the PEOU has direct correlation with the PU because the PEOU may facilitate the realization of the devices' functions such as measuring vital signs. In the research of Chau et al., (2019), they stated that the perceived convenient (PC) is similar with PEOU and they chose PC as one of the independent variables of adoption intention of wearable healthcare devices. These researchers obtained similar results which showed that that the PC has positive relationship with the adoption intention but not the strongest variable compared with others.

Similarly, most of the researchers have suggested the manufacturers of wearable healthcare devices to continuously enhance the technical features which is PU, PEOU and so on. Zhang et al. (2017) recommended that the manufacturers have to improve their hardware and software systems to enhance the technological advantages as well as increase the PC to the users.

2.2.4 3rd Independent Variable: Health Belief

The definition of health beliefs encompasses individuals' perceptions of their own health, their understanding of what defines good health, their awareness of the underlying causes of their illnesses, and their strategies for overcoming them (Misra & Kaster, 2012). Health beliefs play an important role in shaping consumers' intentions to adopt wearable healthcare devices, as highlighted by numerous studies (Cheung et al., 2019; Zhang et al., 2017; Chau et al., 2019). These studies underscore the significance of health beliefs in determining

adoption intention. Cheung et al. (2019) emphasize that health belief, as derived from the Health Belief Model (HBM), reflects consumers' personal ideas about the efficacy of specific actions in improving health. According to the HBM, an individual's belief in their susceptibility to a particular health problem determines their willingness to use preventative measures or technology (Skinner et al., 2015). In terms of wearable healthcare devices, individuals who perceive themselves as more susceptible to chronic conditions or those seeking to maintain their overall health may be more likely to embrace wearable devices for continuous monitoring and early identification of health issues.

Furthermore, health belief is also closely linked with the perceived benefit of wearable healthcare devices, along with the increase of self-health awareness which will increase the technology wearables being produced to address healthcare needs (Edward et al., 2020). Perceived benefit is one of the key elements within HBM that is related to the person's beliefs according to the degree of helpfulness in reducing the disease threat will influence the behavior change (Champion & Skinner, 2008). According to Chau et al. (2019), wearable healthcare devices such as smartwatches and wristbands serve various functions, including providing users with health data to monitor their health status or health progress and make informed workout plans. As a result, empirical studies typically use health beliefs as a variable in determining the customers' adoption of wearable healthcare devices.

In addition, as stated by Zhang et al. (2017), individuals' propensity to engage in health-related behaviors, such as the adoption of wearable healthcare devices, can be forecasted based on their beliefs regarding personal risks and the efficacy of proposed actions, as outlined in the Health Belief Model. Therefore, stronger health beliefs are associated with a stronger perception of the usefulness of wearable healthcare devices in enhancing health outcomes. Moreover, the study conducted by Lee and Lee (2020) delves into the interplay among health beliefs, attitudes, and behaviors concerning the adoption and continuing use of wearable healthcare devices. They state that people's desire to live a healthy

lifestyle will positively change their perceptions towards health-related devices, consequently increasing their willingness to embrace and utilize such devices.

Besides that, health beliefs are also influenced by the individual's surroundings, the norms, and the culture of adaptability and acceptance towards the technology itself. According to Lunney et al. (2016), complementary technology has been widely used such as wearable fitness trackers (WFTs) alongside with the adoption of smartphones. In other words, the introduction of WFTs as the byproduct of smartphones has enhanced the perceived usefulness and the health beliefs of individuals. The reasoning behind this is due to the function of WFTs such as calories burned or workout intensity that will motivate the individual in their exercise or to pursue their goals and progress. Therefore, these benefits of exercise that are exhibited by wearable healthcare devices will affect the probability of an individual adopting it as more benefits will attract extra willingness to exercise (Wu et al., 2020).

2.3 Conceptual Framework

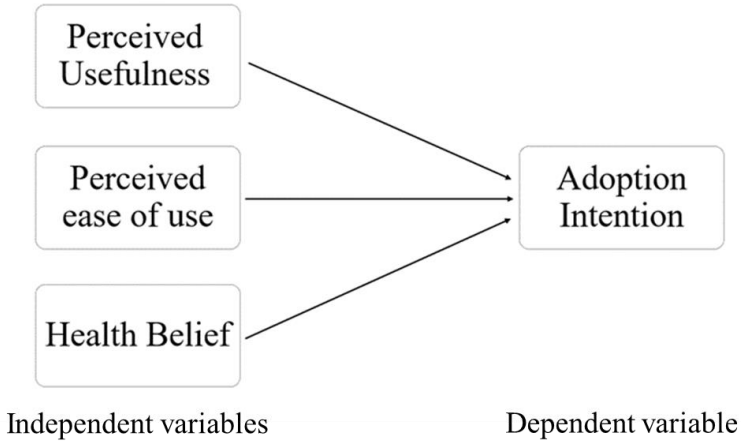

Figure 2.3.1. Proposed Conceptual Framework

Figure 2.3.1 displays the factors that will influence the adoption intention of wearable healthcare devices. The dependent variable is adoption intention, while the independent variables are perceived usefulness, perceived ease of use and health belief.

2.4 Hypotheses Development

2.4.1 Perceive Usefulness and Adoption Intention

PU has been widely investigated and applied in multiple studies to evaluate the acceptance of various technologies in the healthcare sector (AlQudah et al., 2021). Lee et al. (2013) observed that PU has been recognized as a factor influencing user attitudes and directly affecting the intention to persist in using information systems. According to Chau et al. (2019), if user perceive wearable healthcare devices, such as healthcare applications, smart glasses, and smartwatches, is helpful in enhancing their health status, their positive anticipation of such usefulness boosts their willingness and intent to adopt and utilize these wearable healthcare devices. Previous study has explored that PU positively influence intentions to adopt wearable devices, particularly in the context of sports, fitness, and healthcare (Chau et al., 2019; Kim & Chiu, 2019; Yang et al., 2022;). The research of Bianchi et al. (2022) and Cheung et al. (2020) have proposed perceive usefulness is a strong driver of wearable adoption in healthcare. Therefore, it is anticipated that the element influencing adoption intention of wearable healthcare devices is PU.

H1: Perceived usefulness has a positive relationship with the adoption intention of wearable healthcare devices.

2.4.2 Perceived Ease of Use and Adoption Intention

According to Chau et al., (2019), the perceived ease of use (PEOU) was examined that having strong and directly relationship with the intention of adopting wearable healthcare devices. However, Cheung et al., (2020) found that PEOU has less impact than the other independent variables in their research which are perceived credibility and perceived usefulness. Due to this, this study envisages that there is a direct relationship between perceived ease of use and the adoption intention of wearable healthcare devices.

H2: Perceived ease of use has a positive relationship with the adoption intention of wearable healthcare devices.

2.4.3 Health Belief and Adoption Intention

According to the study conducted by Zhang et al. (2017), wearable healthcare devices aim to facilitate health behavior change and enhance individuals' overall health status, stronger health beliefs are likely to influence consumers' perceptions of the usefulness of wearable healthcare devices in improving their health outcomes. Furthermore, wearable healthcare devices provide users with real-time data regarding their health metrics, allowing them to effectively monitor and track their progress toward health-related goals (Chau et al., 2019). Moreover, according to Zhu et al. (2022), when individuals perceive a higher risk of chronic disease or believe the potential harm from such diseases is significant, they are more likely to adopt health devices to mitigate the threat. Meanwhile, research by Cheung et al. (2019) and Lee and Lee (2020) found that health beliefs have a positive impact on the intention to embrace wearable

healthcare devices. Consequently, it suggested a positive impact between health beliefs and the adoption intention of healthcare wearable technology. Therefore, the following hypothesis is proposed:

H3: Health beliefs have a positive relationship with the adoption intention of wearable healthcare devices.

2.5 Chapter Summary

In short, TAM and HBM are applied in this research. Perceive Usefulness, Perceive Ease of Use and Health Belief might have influenced Generation Z to adopt to wearable healthcare devices. The research methods will be discussed in the next chapter.

CHAPTER 3: METHODLOGY

3.0 Introduction

Chapter 3 outlines the research approach used to collect data and address the research issue. Initially, the research design will determine whether the question-answering method will be qualitative or quantitative. Following that, data collection methods, sampling design, research instruments, construct measurement, data processing, and analysis will be discussed. Lastly, a chapter summary will be provided.

3.1 Research Design

Research design has been suggested for gathering, evaluating, and interpreting data in order to provide the necessary data more effectively, efficiently, and systematically (Zikmund,2013). This study has utilized a quantitative research approach to evaluate the determinants of the adoption intention of wearable healthcare devices. A quantitative research technique is characterized by using numerical or statistical methods in the design of a study (Watson, 2015). Subsequently, this study employed a systematic approach to gather numerical data through a questionnaire to evaluate the relationship between the independent variables (perceived usefulness, perceived ease of use, and health belief) and the dependent variable (adoption intention) towards wearable healthcare devices. Besides, the present study is a cross-sectional study which refers to gathering data from a selected population or subgroup at a specific point in time to investigate relationships between variables of interest (Olsen et al., 2004). In this study, data would be collected at a single point in time to examine the relationships

between perceived usefulness, perceived ease of use, health belief, and the intention to adopt wearable healthcare devices among Generation Z in Malaysia.

3.2 Sampling Design

Sampling design refers to the process of choosing individuals from a larger population for the purpose of inclusion in research (Turner, 2020). Therefore, it is used to select a subset of target population to acquire data for accurate measurement. A population can be identified based on the selection of sample (Datta, 2018).

3.2.1 Target Population

According to Willie (2022), target population refers to the entire group of people, objects, or events that the researcher intends to investigate. The target population of this research is Generation Z, which refers to the people who were born between 1996 and 2006. This is because Generation Z is technology savvy, they can access the internet, social networks, and similar digital technologies from a young age. Also, new technologies have become an integral part of their everyday lives, they are showing a high level of willingness to learn and utilize it (Dolot, 2018). Therefore, this group has become the ideal target population for the research, because they possess a high level of digital literacy.

3.3.2 Sampling Frame

The sampling frame refers to a list displaying individuals selected from the desired population and considered appropriate for the research (Turner, 2003). In this study, the target population is Generation Z in Malaysia, because they currently represent the biggest age demographic in Malaysia, which accounting for 25% of the total population. According to Tjiptono et al. (2022), they are considered tech-savvy and have the ability to easily adapt to new technological innovations. Nevertheless, sampling frame is not available.

3.2.3 Sampling Elements and Sampling Procedure

Sampling elements refer to identifying the potential respondents who are appropriate for research purposes. In this study, any individual belonging to Generation Z with aged between 18 to 28 years old is eligible to participate by completing the questionnaire. Two prerequisite questions are designed at the beginning of the questionnaire, asking respondents about their current age range and nationality. This is intended to filter out the individuals who are not Generation Z and Malaysian. Therefore, only individuals aged between 18 and 28 years old and currently residing in Malaysia are qualified to complete the survey. The attention to those above 18 years but meet the criteria of Generation Z mainly to ensure there are no issues with the legal consent for participation in surveys. Those below 18 years old are considered as minors and are excluded from participating in this survey to comply with Malaysian law regarding minors and contracts (Viggnes, 2024). Besides, the respondents should be a Malaysia citizen. An additional filter question was designed to ascertain whether the respondents meet this criterion as well. An online survey will be used for data collection whereby a survey link will be shared with the respondents through social media channels, such as Facebook, WhatsApp,

Instagram, and more. The respondents can be from any state and Federal Territory of Malaysia and meet the criteria that have been specified earlier.

3.2.4 Sampling Techniques

Probability sampling and non-probability sampling are the two majot type of sampling techniques. Probability sampling refers to random sampling which indicates that each person in the population has a known and non-zero chance of being selected because of the randomization is used in place of deliberate choice in this type of sample selection. On the other hand, the non-probability sample is being used when the researcher specifically selects items or respondents for the sample according to non-random criteria like affordability, accessibility, or convenience (Sampling Methods: Types, Techniques & Best Practices, 2024).

Non-probability techniques are used in this study. Among the non-probability techniques, the purposive sampling technique will be used. Purposive sampling s a technique used to choose a particular group of people or units for analysis which relies on the judgement of the researchers (Dovetail Editorial Team, 2023). In other words, the participants will be chosen on purpose based on specific criteria or characteristics that are set by the researchers. This sampling technique concentrate on specific traits of an interest within a population while enabling the researchers obtain the best and related response of the research questions. Not only that, the researchers can also save time and money by using this sampling technique when selecting samples in compliance with the determined characteristics (Moss, 2020). As the stated general objective of this research, the target audiences are from the younger population, which is the Generation Z, so the participants will be selected by the age of them.

3.2.5 Sampling Size

Table 3.2.5.1:

Krejcie and Morgan Table (1970)

Table for Determining Sample Size from a Given Population

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.

According to Department of Statistic Malaysia, the total population in Malaysia is 34.3million, while Generation Z is 8.5 million (Tjiptono et al., 2020). The sample size in this study is determined based on Krejcie and Morgan Table (1970). Referring to this table, when the population is above 1 million, the sample size would be 384. Hence, for a population group of 8.5 million, the ideal sample size to be used in the study will be 384 respondents.

3.3 Data Collection Methods

Data collection refers to a range of methods and techniques employed to obtain information on specific study variables (Taherdoost, 2021). These techniques play a crucial role during the data analysis stage, assisting in the achievement of desired study outcomes, addressing research questions, and testing hypotheses. Furthermore, data collecting is an important phase in research since it improves the quality of study findings by reducing the possibility of errors that may occur throughout the project. Therefore, this study employs a primary data collection approach.

3.3.1 Primary Data

According to Ajayi (2017), primary data refers to the information gathered directly by the researcher through various types of methods such as investigations, questionnaires, research studies, surveys, and interviews. In this study, we utilize online self-administrative questionnaires. Respondents are asked to select the most appropriate answers from a list of choices. The questionnaire will be distributed to Generation Z individuals in Malaysia through Google Forms. The survey is voluntary and anonymous, the participants are free to select the answers that they think are most relevant to their situation.

Besides, the participants are free to discontinue the online survey and the incomplete questionnaires were regarded as invalid. The advantages of online survey are cost-efficiency, time-saving, and ability to reach a broader number of respondents. Ethical clearance will be obtained from the university's scientific review committee before the data collection process.

The actual investigation started on 27 May 2024 and ended on 7 July 2024, while the data collection took 41 days to complete. A total of 396 responses were collected, however 5 of them were discarded due to missing data. Thus ,the final valid responses obtained were 391.

3.4 Research Instrument

The questionnaires consist of fixed-alternative questions to ensure that the questions and the answer choices are specific enough. The questionnaire contains with four sections, Section A focuses on demographic profile (8 questions); Section B explores the factors influencing the adoption intention of wearable healthcare devices (15 questions), and Section C related to their adoption intention (3 questions).

In Section A, respondents will provide their demographic information such as current age, nationality, gender, race, age group, residing state or federal territory, work status, and whether they were familiar with wearable healthcare devices. Section B examined factors affecting the adoption intention of wearable healthcare devices and consisted of three independent variables. Section C focused on adoption intention, addressing the dependent variables.

3.5 Pilot Study

According to Trakulmaykee et al. (2013), pilot study refers to a form of pretest in which a small number of questionnaires are sent out to assess the questionnaire's accuracy, consistency, and reliability. Before the actual study is conducted, we have invited 30 participants who are the Generation Z through social media platforms. This pilot study will assist us in identifying and correcting any potential issues before the actual

investigation (Dikkow, 2016). Following, this study has utilized the SPSS software to input and test the obtained data for reliability, as interpreted in Table 3.5.1. The actual investigation started on the 27 May 2024 and end on 7 July 2024, the data collection has taken 41 days to complete. There are total 396 responses collected, however 5 of them are discarded due to missing data, so the final valid responses obtained is 391.

Table 3.5.1:

Pilot Test

	Variables	**Cronbach's Alpha**	**No. of items**	**Internal Consistency**
Dependent Variable (DV)	Adoption intention	0.88	3	Very Good
Independent Variable (IV)	Perceived usefulness	0.93	5	Excellent
	Perceived ease of use	0.882	6	Very Good
	Health belief	0.795	4	Good

Source: Data from SPSS

3.5.1 Construct Measurement

Table 3.5.1.1, shows the origins of constructs used in this study. Each construct has been derived from previous published studies and the sources of the adopted constructs are also listed.

Table 3.5.1.1:

Origin of Construct

Variables	Items	Sample of Items	Source
Independent: Perceived usefulness	Section B Q1 – Q5	I think that wearing a wearable healthcare device would be useful in my daily life.	Adopted from Bianchi et al., (2022)
Independent: Perceived ease of use	Section B Q6 – Q11	My interaction with the wearable healthcare device would be clear and understandable.	Adopted from Chau et al., (2019)
Independent: Health Belief	Section B Q12 – Q15	I realize that bad living habits will cause harm to my health.	Adopted from Zhang et al., (2017)
Dependent: Adoption Intention of Wearable Health Devices	Section C Q1 – Q3	I am interested in using the wearable healthcare device.	Adopted from Chau et al., (2019)

3.5.2 Scale of Measurement

The scale measurement serves as a categorization system employed to classify and identify various types of variables based on their characteristics. In this

research, Section A was measured using the nominal and ordinal scales while the interval scale was applied in Sections B and C.

In this questionnaire, Section A will have 7 **nominal scale** questions, which are questions 1, 2, 3, 4, 6, 7, and 8. Besides that, question 5 in Section A utilizes an **ordinal scale**. The questions (age groups) are ranked from the lowest to the highest age groups (18 to 28 years old). In Sections B and C, this study have employed the **interval scale**, which utilizes the measurement of the Five-Point Likert scale. This approach enables respondents to rate their level of agreement according to a scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Sample of Items

Nominal Scale

3. Gender
   - □ Male
   - □ Female

Figure 3.5.2.1. Demographic (Nominal Scale)

Ordinal Scale

5. Age Group
   - □ 18-20 years old
   - □ 21-23 years old
   - □ 24-26 years old
   - □ 27-28 years old

Figure 3.5.2.2. Demographic (Ordinal Scale)

Interval Scale

Perceived usefulness

No.	Description	SD	D	N	A	SA
1.	I think that wearing a wearable healthcare device would be useful in my daily life.	1	2	3	4	5
2.	I think that wearing a wearable healthcare device would be helpful to monitor my health.	1	2	3	4	5

Figure 3.5.2.3. Perceive Usefulness (Interval Scale)

3.6 Data Analysis Tool

3.6.1 Descriptive Analysis

Descriptive analysis refers to a type of statistics focus on organizing and presenting the data in a clear and efficient approach (Simplilearn, 2023). Descriptive analysis focuses on assessing and summarizing the main features of a dataset without concluding a broader population.

Descriptive analysis is aimed at giving a brief and understandable summary of the sample and data measures to make researchers or analysts gain ideas on the current patterns, trends, and distributions within the dataset (Simplilearn, 2023). In order to make the viewers or the users understand the data in shorter time, the data can be represented in tables, graphs and charts that can help with information interpretation and visualization. The common graphical techniques include the bar charts, pie charts, histograms and so on.

Descriptive analysis is very important because it enables the researchers to recognise the patterns and relationships within the data through the overview of a dataset by succinctly summarizing and describing its key characteristics.

3.6.2 Reliability Analysis

Reliability analysis is a way to test the degree of consistency after measuring something in repeated numerous times by using the same method (Statistics Solutions, 2024). Reliability analysis is used to compute several scale

reliability metrics as well as provides information on the relationships between the several scale's individual items. A scale is considered reliable if it produces consistent results and has a high association in reliability analysis (Statistics Solutions, 2024). Reliability analysis is important in the research to verify the accuracy of the questionnaire by checking the consistency of the responses given by the respondents.

Cronbach's Alpha is used to examine the reliability by comparing the degree of covariance among the items that comprise an instrument to the total variance (Collins, 2007). If the variance is reliable, there should be a high degree of covariance among the items relative to the variance, which is within the range of 0.6 to 1.0. The closer gap to 1.0, the better and more reliable of the result.

Table 3.6.2.1:

Rules of Thumb Cronbach's Alpha Coefficient Size

Cronbach's Alpha	**Internal Consistency**
<0.6	Poor
0.6 to < 0.7	Moderate
0.7 to < 0.8	Good
0.8 to < 0.9	Very Good
0.9	Excellent

Source: Shamsuddin et al., (2015).

Accordance with the rules of Thumb Cronbach's Alpha coefficient size, the variable value below 0.6 is considered as having poor reliability. The value between 0.6 to 0.69 is considered moderate, value between 25 0.7 to 0.79 is considered good, value between 0.8 to 0.89 is considered very good and value at 0.9 and above is considered as excellent.

3.6.3 Inferential Analysis

Inferential analysis is a subfield of statistics which uses a variety of analytical techniques to extrapolate conclusions about population data from sample data (Inferential Statistics - Definition, Types, Examples, Formulas, n.d.). In this analysis, the measurements from the experiment's sample of subjects are used to compare variables differences and draw conclusions about the study's larger subject population (Kalish & Thevenow-Harrison, 2014).

The Multiple Regression Analysis is the statistical technique that used in our study. Multiple Regression Analysis is used to identify the relationship between a single dependent variable and several independent variables. In this research, the relationship between a single dependent variable which is adoption intention and several independent variables which are perceived usefulness, perceived ease of use and health belief is tested by using multiple regression analysis. The three independent variables can significantly explain the covariance in adoption intention of wearable healthcare devices among the Generation Z in Malaysia.

The formula of Multiple Regression Analysis is $Y = a+ b1x1 + b2x2 + \dots + bnxn$. The Y represents the dependent variable, “a” represents the constant or intercept, “b” represents the partial regression coefficients and “x” represents the independent variables.

The multiple regression equation in this research is:

$CL = a + b1CS + b2I$

3.7 Chapter Summary

In conclusion, Chapter 3 has provided the summary of the data collection methods and process. The sampling design, research instrument and constructs measurement have

been discussed and optimised to propose a comprehensive and easy understanding questionnaire. Furthermore, the preparation processes and data analysis were recorded into table for easy viewing and comparison.

CHAPTER 4 DATA ANALYSIS

4.0 INTRODUCTION

In this chapter, the focuses will be on the analysis of data. The primary objective is to evaluate and interpret the data in relation to the research questions and hypotheses established in previous chapters. We have collected 392 surveys and analyse it by using SPSS 27.0. The beginning of this chapter will discuss the respondent demographic profile, followed by the scale measurement, central tendencies and multicollinearity test. The findings providing insights into how they support or refute the hypotheses.

4.1 Respondent Demographic Profile

The information presented below pertains to the gender, race, age group, residing state or federal territories, work status and awareness of wearable healthcare devices.

4.1.1 Gender

Table 4.1.1.1:

Respondents' gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	117	29.9	29.9	29.9
	Female	274	70.1	70.1	100.0
	Total	391	100.0	100.0	

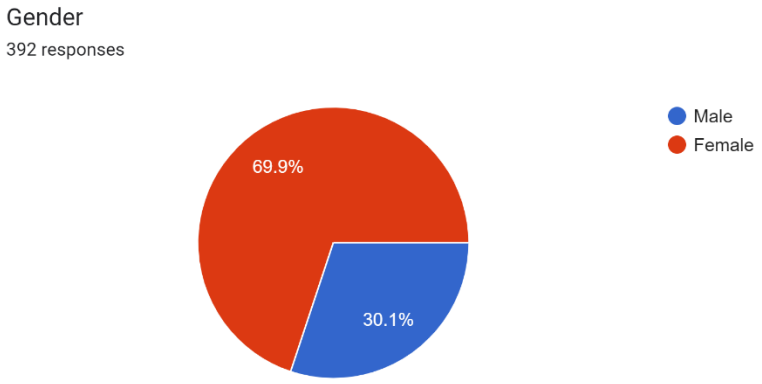

Figure 4.1.1.1. Respondents' gender

Table 4.1.1.1 and Figure 4.1.1.1showed that the gender in descriptive analysis. Out of the 392 respondents, female respondent occupied 274 (69.9%), while male respondents represent 118 (30.1%).

4.1.2 Race

Table 4.1.2.1:

Respondents' race

Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chinese	320	81.8	81.8	81.8
	Malay	33	8.4	8.4	90.3
	Indian	38	9.7	9.7	100.0
	Total	391	100.0	100.0	

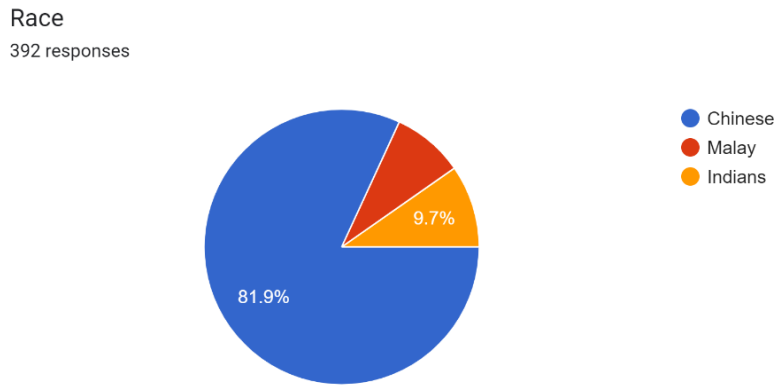

Figure 4.1.2.1. Respondents' race

According to Table 4.1.2.1 and Figure 4.1.2.1, it showed the race of the respondents. Majority of the respondents are Chinese, accounting for 320 (81.8%), 33 respondents (8.4%) are Malay and 38 respondents (9.7%) is Indian.

4.1.3 Age group

Table 4.1.3.1:

Respondents' age

Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-20 years old	61	15.6	15.6	15.6
	21-23 years old	242	61.9	61.9	77.5
	24-26 years old	62	15.9	15.9	93.4
	27-28 years old	26	6.6	6.6	100.0
	Total	391	100.0	100.0	

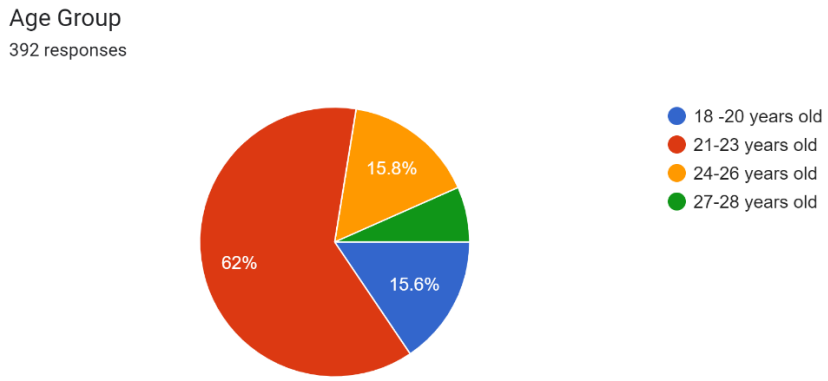

Figure 4.1.3.1. Respondents' age

Table 4.1.3.1 and Figure 4.1.3.1 showed the age of respondents, which classified into four age groups. There are 61 respondents (15.6%) under 18-20 years old, 242 respondents (61.9%) under 21-23 years old, 62 respondents (15.9%) under 24-26 years old while 26 respondents (6.6%) under 27-28 years old.

4.1.4 Residing State/ Federal Territories

Table 4.1.4.1:

Respondents' residing state/ federal territories

Residing State/ Federal Territories

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Selangor	71	18.2	18.2	18.2
	Kuala Lumpur	46	11.8	11.8	29.9
	Putrajaya	4	1.0	1.0	30.9
	Perak	82	21.0	21.0	51.9
	Johor	60	15.3	15.3	67.3
	Pahang	4	1.0	1.0	68.3
	Penang	31	7.9	7.9	76.2
	Melaka	7	1.8	1.8	78.0
	Negeri Sembilan	11	2.8	2.8	80.8
	Kedah	14	3.6	3.6	84.4
	Perlis	6	1.5	1.5	85.9
	Kelantan	5	1.3	1.3	87.2
	Terengganu	2	.5	.5	87.7
	Sarawak	16	4.1	4.1	91.8
	Sabah	32	8.2	8.2	100.0
	Total	391	100.0	100.0	

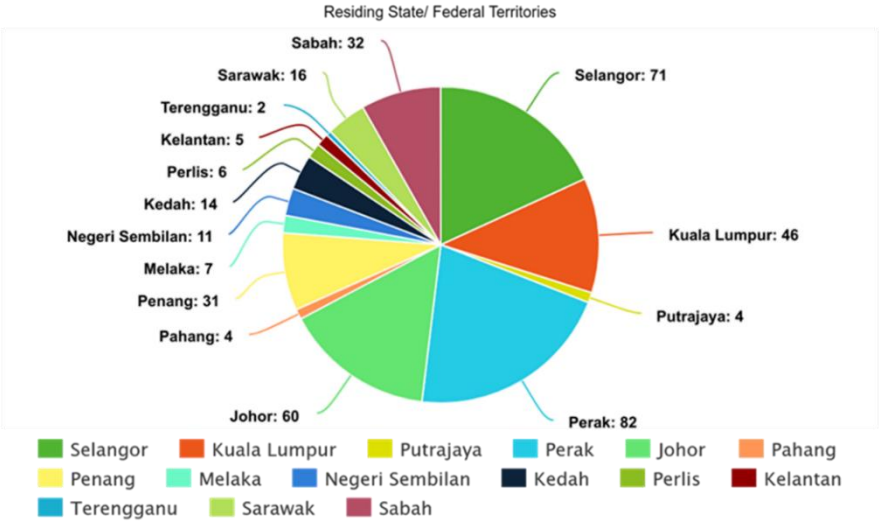

Figure 4.1.4.1. Respondents' residing state/ federal territories

Table 4.1.4.1 and Figure 4.1.4.1 showed the residing state or federal territories of respondents. There are 71 respondents (18.2%) from Selangor, 46 respondents (11.8%) from Kuala Lumpur, 4 respondents (1.0%) from Putrajaya, 82 respondents (21%) from Perak. 60 respondents (15.3%) from Johor, 4 respondents (1.0%) from Pahang, 31 respondents (7.9%) from Penang, 7 respondents (1.8%) from Melaka, 11 respondents (2.8%) from Negeri Sembilan,

14 respondents (3.6%) from Kedah, 6 respondents (1.5%) from Perlis, 5 respondents (1.3%) from Kelantan, 2 respondents (0.5%) from Terengganu, 16 respondents (4.1%) from Sarawak and 32 respondents (8.2%) from Sabah.

4.1.5 Work Status

Table 4.1.5.1:

Respondents' work status

Work Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full-time employee	56	14.3	14.3	14.3
	Part-time employee	28	7.2	7.2	21.5
	Student	300	76.7	76.7	98.2
	Unemployed	7	1.8	1.8	100.0
	Total	391	100.0	100.0	

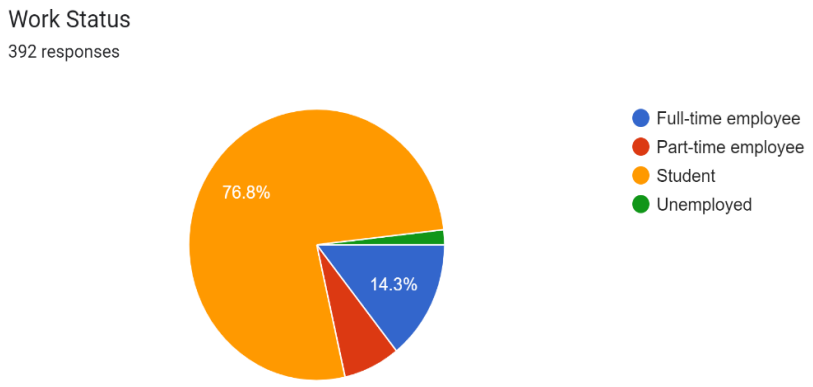

Figure 4.1.5.1. Respondents' work status

Table 4.1.5.1 and Figure 4.1.5.1 showed the work status of respondents. There are 56 respondents (14.3%) are full-time employee, 28 respondents (7.2%) are part-time employee, 300 respondents (76.7%) are students, and 7 respondents (1.8%) are unemployed.

4.1.6 Awareness of Wearable Healthcare Devices

Table 4.1.6.1:

Awareness of wearable healthcare devices

Awareness of wearable healthcare devices

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	336	85.9	85.9	85.9
	No	55	14.1	14.1	100.0
	Total	391	100.0	100.0	

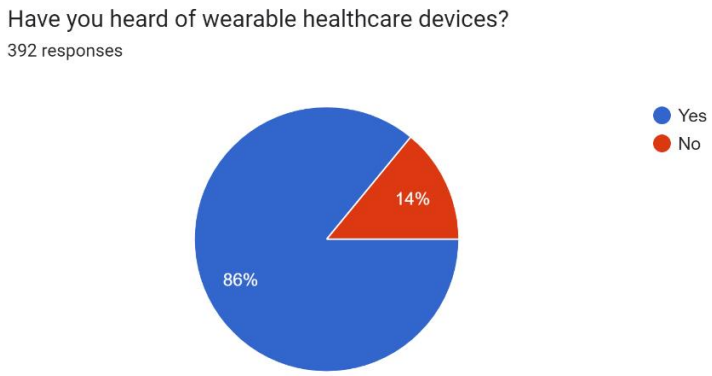

Figure 4.1.6.1. Awareness of wearable healthcare devices

Table 4.1.6.1 and Figure 4.1.6.1 indicate the awareness of respondents towards wearable healthcare devices. There are 336 respondents (85.9%) heard of wearable healthcare devices, while 55 respondents (14.1%) never heard of wearable healthcare devices.

4.2 Scale Measurement

Table 4.2.1:

Rules of Thumb Cronbach's Alpha Coefficient Size

Cronbach's Alpha	Internal Consistency
<0.6	Poor
0.6 to < 0.7	Moderate
0.7 to < 0.8	Good
0.8 to < 0.9	Very Good
0.9	Excellent

Source: Shamsuddin et al., (2015)

Table 4.2.2:

Reliability test on perceived usefulness

Alpha value (α)	No of items
0.825	5

Based on table 4.2.2, the results of the reliability test show that the Cronbach's Alpha for perceived usefulness is 0.825. This Cronbach's Alpha (0.825) is within the range of 0.8 to < 0.9, indicating that the 5 items measuring perceived usefulness have very good reliability.

Table 4.2.3:

Reliability test on perceived ease of use

Alpha value (α)	No of items
0.820	6

Based on the table 4.2.3, the results of the reliability test indicate that the Cronbach's Alpha for perceived ease of use is 0.820. The Cronbach's Alpha (0.820) is within the range of 0.8 to < 0.9, meaning that the 6 items evaluating perceived ease of use have very good reliability.

Table 4.2.4:

Reliability test on health belief

Alpha value (α)	**No of items**
0.718	4

Based on the table 4.2.4, the results of the reliability test show that the Cronbach's Alpha for health belief is 0.718. The Cronbach's Alpha (0.718) is within the range of 0.7 to < 0.8, meaning that the 4 items measuring health belief have good reliability.

Table 4.2.5:

Reliability test on adoption intention of wearable healthcare devices

Alpha value (α)	**No of items**
0.811	3

Based on the table 4.2.5, the results of the reliability test indicate that the Cronbach's Alpha for adoption intention of wearable healthcare devices is 0.811. The Cronbach's Alpha (0.811) is within the range of 0.8 to < 0.9, meaning that the 3 items evaluating adoption intention of wearable healthcare devices have very good reliability.

Table 4.2.6:

Reliability test results

	Variables	**Alpha value (α)**	**No of items**	**Reliability**
Independent Variable (IV)	Perceived usefulness	0.825	5	Very Good
	Perceived ease of use	0.820	6	Very Good
	Health belief	0.718	4	Good
Dependent Variable (DV)	Adoption intention	0.811	3	Very Good

According to the table 4.2.6, it has demonstrated that the Cronbach's Alpha value of all variables which includes independent variables (perceived usefulness, perceived usefulness, health belief) and dependent variable (adoption intention) are above 0.60. The findings indicate that all items in the variables are satisfactory reliability. Hence, the survey does not require re-tests because none of the items have low Cronbach's Alpha value.

4.3 Central Tendencies

Table 4.3:

Central Tendencies

Variables	Mean	Standard Deviations
Perceived usefulness	4.3	0.60
Perceived ease of use	4.2	0.64
Health belief	4.4	0.53
Adoption intention	4.2	0.76

The table show the mean score and standard deviation for four key variables assessed in the study. Perceived usefulness has a mean score of 4.3 and a standard deviation of 0.60. Perceived ease of use has an average score of 4.2 and a standard deviation of 0.64. The mean score of health belief is 4.4 and standard deviation is 0.53. finally, average score of adoption intention is 4.2 and standard deviation is 0.76.

4.4 Multicollinearity Test

Accordance with Hayes (2024), the multicollinearity is known as a statistical concept which describes the correlation between multiple independent variables in a model. It happens when multiple variables in a multiple linear regression analysis have a significant correlation with both the dependent variable and one another (Shrestha, 2020). The multicollinearity test is vital as a way to understand the correlation between the independent variables since the reduced reliability in statistical inferences will arise from multicollinearity among independent variables (Hayes, 2024).

4.4.1 Correlations Matrix

Table 4.4.1.1:

Correlation Matrix

		PerceiveUsefulness	PerceiceEaseOfUse	HealthBelief	AdoptionIntention
PerceiveUsefulness	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	391			

PerceiceEase OfUse	Pearson Correlation	.647**	1		
	Sig. (2-tailed)	.000			
	N	391	391		
HealthBelief	Pearson Correlation	.527**	.507**	1	
	Sig. (2-tailed)	.000	.000		
	N	391	391	391	
AdoptionIntention	Pearson Correlation	.674**	.670**	.483**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	391	391	391	391

Firstly, the Pearson correlation was used in examining the correlation between the **independent variables** in this study. Following Hair (2010), if the correlation coefficient of the independent variable is 0.90 and above, it is considered as an existing multicollinearity between exogenous latent constructs. The table 4.4.1.1 has shown the result of correlation analysis which describes the correlation among the independent variable in the model. The results shows that the correlation values between all the independent variables were lower than 0.9, hence there are no problem of multicollinearity among the variables.

Besides that, the correlation between the dependent and independent variables were discovered. Perceived Usefulness (r = 0.647, p = 0.000), Perceived Ease of Use (r = 0.507, p =0.000) and Health Belief (r = 0.483, p = 0.000) were found to have positive correlation with Adoption Intention.

Table 4.4.1.2:

Results of Tolerance Effect and Variance Inflation Factors

Description	**Collinearity Statistics**

	Tolerance	**VIF**
Perceived Usefulness	0.528	1.893
Perceived Ease of Use	0.543	1.840
Health Belief	0.675	1.483
Dependent Variable: Adoption Intention		

*VIF = Variance Inflation Factors

Secondly, the tolerance and variance inflation factors (VIF) are also tested due to these two statistics are closely related to each other for identifying collinearity in multiple (Miles, 2014). Team (2023) suggested that a significant multicollinearity exists when the tolerance is less than 0.1 or the VIF exceeds 10. Based on the table 4.3.2, the values of tolerance effect of the independent variables are between 0.528 to 0.675 while the values of VIF are between 1.483 to 1.893. The results have proved that the multicollinearity does not exist in this study.

4.4.2 Multiple Regression Analysis

Table 4.4.2.1:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.744[a]	.554	.550	.50654

a. Predictors: (Constant), HB_Average, PEOU_Average, PU_Average

b. Dependent Variable: AI_Average

Dependent Variable: Adoption Intention

The R value of the model summary represents the correlation between the independent variables and the dependent variable as a whole of the research. Based on the result of table 4.4.2.1, the value of correlation coefficient (R value) for this study is 0.744, it proved that there was a high and positive correlation between independent variables (health belief, perceived ease of use and perceived usefulness) and dependent variable (adoption intention).

Besides that, the R square shows exactly how much or in what proportion the independent variables are able to account for variances in the dependent variable. Based on the result, the independent variables (health belief, perceived ease of use and perceived usefulness) can explain 55.4% of the variations in dependent variable (adoption intention). However, there is still 44.6% unexplained in this study. In short words, there are further variables that are essential in understanding adoption intention in using wearable health device that have not been taken into account in this study.

Table 4.4.2.2:

ANOVA test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	123.246	3	41.082	160.115	.000[b]
	Residual	99.296	387	.257		
	Total	222.542	390			

a. Dependent Variable: AI_Average

b. Predictors: (Constant), HB_Average, PEOU_Average, PU_Average

H1: Health belief, perceived ease of use and perceived usefulness have a significant and positive relationship with adoption intention.

Is H1 (alternate hypothesis) supported?

Found on the result of the table 4.4.2.2, the p-value (Sig. 0.000) is less than alpha value 0.05. Significant F-statistics are present. The relationship between the dependent and predictor variables is well described by the study's model. Therefore, the independent variables (health belief, perceived ease of use and perceived usefulness) are significant explain the variance in adoption intention. As a consequence, the alternate hypothesis is supported by the data.

Table 4.4.2.3:

Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	-.282	.232		-1.217	.224	-.738	.174
	PU_Average	.478	.058	.382	8.184	<.001	.363	.593
	PEOU_Average	.447	.055	.377	8.182	<.001	.339	.554
	HB_Average	.128	.058	.091	2.190	.029	.013	.243

a. Dependent Variable: AI_Average

Is perceived usefulness (predictor variable) significant to predict dependent variable (adoption intention)?

Depend on the result of table 4.4.2.3, perceived usefulness is significant to predicts dependent variable (adoption intention) for this study. This is due to p-value for adoption intention is 0.001 which is less than alpha value 0.05. As such, H1 is supported.

Is perceived ease of use (predictor variable) significant to predict dependent variable (adoption intention)?

Based on the result of table 4.4.2.3, perceived ease of use is significant to predicts dependent variable (adoption intention) for this study. This is due to p-value for adoption intention is 0.001 which is less than alpha value 0.05. As such, H2 is supported.

Is health belief (predictor variable) significant to predict dependent variable (adoption intention)?

Depend on the result of table 4.4.2.3, health belief is significant to predicts dependent variable (adoption intention) for this study. This is due to p-value for adoption intention is 0.029 which is less than alpha value 0.05. As such, H3 is supported.

Regression equation

y = a + b1 (x1) + b2 (x2) + b3 (x3)

y = Customer Loyalty

a = Unstandardized coefficients B (constant) value

b1 = Unstandardized coefficients B customer satisfaction average

x1 = Customer Satisfaction

b2= Unstandardized coefficients B image average

x2 = Image

Adoption intention	= -0.282+ 0.478 (perceived usefulness) + 0.447 (perceived ease of use) + 0.128 (health belief)
	= 0.771

Relative Contribution of Each Predictor

Based on the result, perceived ease of use is the predictor variable that contributes the most to the variation in the adoption intention, as indicated by the largest Beta value (0.055) under standardized coefficients when compared to perceived ease of use and health belief. The value reveals that perceived ease of use has the most significant individual impact in explaining the variation in the adoption intention, after considering the variance accounted for by all other predictor variables in the model.

On the other hand, perceived usefulness with beta value of 0.058 is the second major predictor of adoption intention in the model after comparing with other variables.

Lastly, health belief is the predictor variables that contributes the least to the variation in the adoption intention, as indicated by the smallest Beta value (0.058) under standardized coefficients when compared to the other two variables. The value manifests that the health belief makes the least individual contribution in explaining the variation in the adoption intention after accounting for the variance accounted by all other predictor variables in the model.

CHAPTER 5 : DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

Chapter 5 will start by summarizing the key findings from the previous chapter, moving on to review the major findings of each variable. The managerial and theoretical implications will also investigate. Furthermore, the limitations of the study will be discussed and providing recommendations to future researchers.

5.1 Overview of Statistical Analysis

A detailed summary of the statistical analysis is provided, highlighting the relationships between variables and their impact on the study outcomes.

Table 5.1:

Summary of Multiple Regression Results

Hypothesis	Description	Standardised Beta coefficient (β) value and p-value	Result
H1:	Perceived usefulness has a positive relationship with the adoption intention of wearable healthcare devices.	β= 0.382 p<0.001	Significant

H2:	Perceived ease of use has a positive relationship with the adoption intention of wearable healthcare devices.	β= 0.377 p<0.001	Significant
H3:	Health beliefs have a positive relationship with the adoption intention of wearable healthcare devices.	β= 0.091 p= 0.029	Significant

5.2 Discussions of Major Findings

5.2.1 The relationship between perceived usefulness and adoption intention of wearable healthcare devices

According to the study presented in Chapter 4, the result showed perceived usefulness is positively related to adoption intention of wearable healthcare devices. Ezurike (2023) also proposed a same finding, which the perceive usefulness was a key factor driving Gen-Z's adoption of wearable technology. This finding indicates that the information and knowledge consumers possess will influence their attitudes toward wearable healthcare devices. In short, individuals believe that using wearable healthcare devices will help them maintain or enhance their health status, this in turn will boosts their intention to utilize these devices.

Our study result is consistence with previous research. For instance, Huarng et al. (2022) discovered PU was the most influential factors in the adoption of new technologies. Similarly, Chau et al. (2019) found that perceived usefulness significantly enhances the intention to adopt healthcare wearable technology, supporting the idea that perceived usefulness is a key component in the adoption

process. The study of Lunney et al. (2016) demonstrated that perceived usefulness directly affects attitudes of individual's towards purchasing wearable healthcare devices, supporting the idea that perceived usefulness enhances the intention to adopt these technologies.

5.2.2 The relationship between perceived ease of use and adoption intention of wearable healthcare devices

According to the study presented in Chapter 4, the result showed there is a positive relationship between perceived ease of use and the adoption intention of wearable healthcare devices. This finding aligns with Yin et al. (2022), the researcher identified perceived ease of use as a crucial predictor of behavioural intention, which subsequently influenced consumers' actual use of wearable healthcare devices. Furthermore, the simplification and improved ease of technology have been recognized as key benefits of wearable devices (Us, 2014).

In this study, it has been proven that adoption intention of wearable healthcare devices can be affected by perceived ease of use. This suggests it is essential to ensure the wearable healthcare devices are easy to use, in order to raise the consumers' willingness to use those devices for health purpose (Beh et al., 2019). Their attitudes and behaviours toward wearables are significantly influenced by perceived ease of use. When they find wearable devices are easy to operate, they are more likely to perceive these products as beneficial for their physical activities, leading to a positive impression and higher likelihood of use (Wang et al., 2023).

5.2.3 The relationship between health beliefs and adoption intention of wearable healthcare devices

There is a positive relationship between health beliefs and adoption intention of wearable healthcare devices. Hence, H3 is accepted. Similar with the result of Chau et al. (2019), found out health belief has minimal impact on adoption intention of healthcare wearable technology. Although the impact is limited, but it still proven true that individual health belief's will directly affect their idea to adopt healthcare wearable technology. In terms of health belief, individuals are becoming increasingly aware of their well-being and are actively implementing both preventive and responsive strategies to safeguard their health (Jamwal et al., 2023). For this reason, wearable healthcare devices is preferred due to the features of providing data related to body health, which encouraging the behaviour to improve health status (Gündüz et al., 2024).

Previous studies mostly identified health beliefs as a driver of consumers' perceived usefulness to wearable healthcare devices. For instance, the exploration of Cheung et al. (2019) demonstrated that health belief is important antecedent to how consumers perceive the usefulness of wearable healthcare devices. The research of Zhang et al. (2017) indicates the significant impact of health belief on perceived usefulness among young females, because they are a group of people who like the activities such as slimming or bodybuilding. Hence, they may be aware of the importance of body data such as sleep patterns and calories consumed, believing that wearable healthcare devices are useful for record and maintain health status. Therefore, their perception of the usefulness of wearable healthcare devices will be enhanced through their health belief.

5.3 Implications of the Study

5.3.1 Managerial Implications

Accordance with the research outcome, the three independent variables (perceived usefulness (PU), perceived ease of use (PEOU) and health belief (HM) have shown the significant and positive relationship with the dependent variable (Adoption intention). The results are important for the relevant parties in order to better understand the impacting factors on the willingness to use wearable health devices among the Generation Z in Malaysia.

According to Technology Acceptance Model (TAM), the PU and PEOU were used as the explanatory variables to explain a user's willingness to adopt and intention to persist in using a certain technology (Ahmad et al., 2020). Because of this, it is vital for the stakeholders to put more effort in increasing the functionality as well as easy operation of the wearable health devices.

5.3.1.1 Implications to policy maker

The government acts as the policy maker can play the role in increasing the usage of wearable health devices among Generation Z. Firstly, the government should promote digital health literacy by implement educational programs in schools and universities as well as the public awareness campaign that focus on the benefits and proper use of wearable health devices. Both these activities can make the audience familiar with the wearable health devices and also alert with the advantages for health monitoring and disease prevention. Other than that, the government can integrate wearable health devices into public

health services which aimed at monitoring and managing chronic conditions as well as preventing diseases. For example, the specialized medical wearables, such as wearable blood pressure monitors and electrocardiogram (ECG) monitors can assist a patient's care team in diagnosing or tracking a chronic illness and also evaluating the effectiveness of a particular treatment plan (DeCesaris, 2024). Hence, the devices can potentially improve patient outcomes by providing specific and accurate feedback. The government can encourage the technology companies to cooperate with the public healthcare facilities to leverage data from the wearable health devices for improving population health management purpose.

Secondly, the government can provide subsidies and incentives to the Generation Z. Since some people may not access to the wearable health devices because of lower financial ability, the government can allocate the subsidies or tax incentives specially for purchasing wearable health devices to make them more affordable for the Generation Z. Furthermore, a health insurance plan used to cover the cost of wearable health devices could be established for making them accessible to a broader audience particularly those chronic disease patients request the devices in long term.

Thirdly, the government must establish the strong data protection laws to ensure that the data privacy and security regulations to protect the personal health data collected by wearable devices are strictly followed. The government may request the manufacturers to disclose the data usage and sharing purposes.

5.3.1.2 Implications to manufacturers

The manufacturers have to understand the target audience and always follow the current trends so that their products may reach to the customers. Firstly, the enhanced features and functionalities are very essential as the regular function of a product. The manufacturers can add in advanced health monitoring features such as stress levels, sleep patterns and mental health indicators that fit in people's daily life. Moreover, the devices have to be able interoperate with other digital health platforms and devices to make the users easier in transferring health data. These special functions can provide a seamless user experience.

Secondly, the manufacturers need to promote the user-centric design as a way to attract different types of potential customers. The manufacturers can produce some stylish but lightweight wearables that can be seamlessly integrated into everyday life. The fashionable and comfortable designs are able to meet the requirements of those Generation Z who focus on the appearance of the devices. Besides, they can also offer customizable and personalized features that appeal to individual preferences and health goals of Generation Z users.

Thirdly, the manufacturers must provide the educational content and support to the user to make them perceived that the devices are easy to use. They should provide some easy-to-understand guides to help users maximize the benefits of their wearable devices, the guides can be in video form for better functions display. Additionally, customer support services is critical to address any technical issues or concerns users may have.

Fourthly, the manufacturers have to make sure that the products they produced are affordable to the Generation Z. They can prove a range of models at different price range to fulfil the customers with various budget levels. This kind of service make the customer with lower budget able to enjoy the devices without compromising on essential features.

For the devices with higher price, the manufacturers can add in some additional services such as regular software updates.

5.3.2 Theorical Implications

This study is aimed at investigating the influence of perceived usefulness (PU), perceived ease of use (PEOU) and health belief (HM) on the adoption intentions regarding wearable healthcare devices among Generation Z in Malaysia. According to the results, all three independent variables were found that having significant and strong relationships with the dependent variable (adoption intention). Apart from that, the findings of this study are in line with the previous studies which proposed the three independent variables as the influencing factors.

The Technology Acceptance Model (TAM) and Health Belief Model (HBM) have been utilised in this study explain the relationship between the independent variables and the dependent variable. The findings has made contribution to the existing literature and offer a fresh theoretical perspective which more focus on the Generation Z.

5.4 Limitation of the study

The first limitation of this study is the potential for response bias. This is because this study employed quantitative methods, specifically using structured questionnaires where respondents are limited to selecting from predefined answers. This approach does not allow participants to provide additional information or elaborate on their

responses. As a result, the data collected may lack of detail and depth, which could potentially miss out on critical insights that qualitative methods might capture. Furthermore, the format of the questions might lead to favorable responses, in which respondent might choose the answers that they perceive as more socially acceptable or desirable, rather than those that accurately reflect their true opinions and experiences. Consequently, it might result in the phenomenon known as social desirable bias (Teh et al., 2023). This bias has the potential to distort the study's findings and affect the overall validity of the research, as the responses may not fully represent the respondents' real opinions and behaviors.

Next, the second limitation is the present study focuses exclusively on Generation Z within Malaysia. Although this demographic is particularly relevant for investigating the adoption intention of wearable healthcare devices due to their high level of technological engagement and digital literacy, this focus limits the generalizability of the findings to other age groups. Generational cohorts often exhibit unique characteristics, interests, and behaviors that are influenced by their respective historical and cultural environments. In this regard, generations such as Gen X and Millennials may possess different attitudes, usage patterns, and health beliefs regarding wearable healthcare devices. For example, Generation X and older adults might value features related to chronic disease management and long-term health monitoring more than Generation Z, who may be more interested in fitness applications (Singh et al., 2022). Moreover, this limitation hinders the ability to generalize the findings to a larger population, thus potentially reducing the utility of the research for stakeholders seeking to understand or influence adoption behaviors across different age groups.

5.5 Recommendations for future research

As previously mentioned, this study had significant limitations. Therefore, the following recommendations are offered to address the constraints and improve the study that will be conducted in the future.

Firstly, the current study's dependence on quantitative methods, particularly structured questionnaires, which may limit the richness of the data collected. Based on the identified limitations of the current study, future research should consider employing a mixed-methods approach to address the problem of response bias. For example, researcher can acquire more detailed data by integrating qualitative methods such as conducting in-depth interviews like face-to-face interview or focus groups alongside structured questionnaires. These qualitative methods allow participants to provide additional information and elaborate on their responses that may not have been considered in the predefined answers (Tenny, 2022). This approach would help capture critical insights that might be missed by quantitative methods alone. Additionally, it would reduce the risk of social desirability bias, as participants would have the opportunity to express their real opinions in their own words, leading to a more accurate reflection of their thoughts and behaviors.

Secondly, the next limitation of this study is its exclusive emphasize on Generation Z. To address the limitation of focusing solely on Generation Z, future research should strive to encompass a broader generational scope. For example, the expanded approach would include examining multiple generational cohorts such as Generation Z, Generation X and Millennials in order to gain a more comprehensive understanding of the factors influencing the adoption of wearable healthcare devices across different age groups. In addition, this method also allows for more accurate and useful findings that can be applied to a wider audience. Apart from that, it helps researchers to developed targeted strategies and promote the use of wearable healthcare devices across all age groups by identifying similarities and differences in the determinants of adoption intention among different generation group. Lastly, it is also benefits for stakeholders who are striving to design and market wearable healthcare devices that cater to the diverse needs and preferences of various age groups.

5.6 Conclusion

In summary, this research has shown the adoption intention of wearable healthcare devices among generation Z in Malaysia. the study reviewed perceive usefulness, perceive ease of use and health belief will affect the adoption intention of wearable healthcare devices. This research aiming to provide deeper insights and recommendations for future researchers and policymakers, theoretical and managerial implications are presented to offer essential advice. Additionally, the study addressed limitations and provided recommendations to assist future researchers in improving the quality of their research endeavours.

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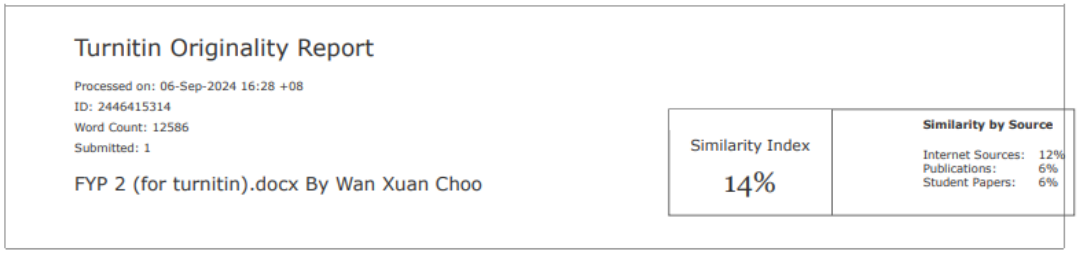
Appendix

Appendix 1: Turnitin report



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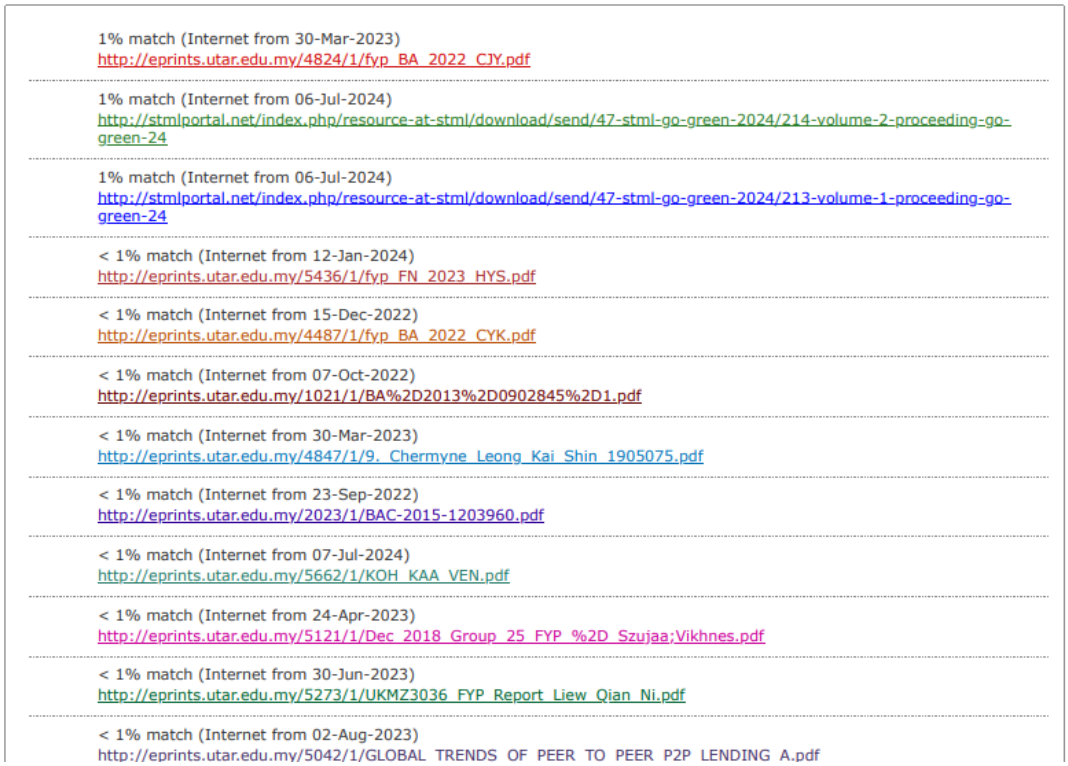

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Appendix 2: Questionnare

Determinants of Adoption Intention of Wearable Healthcare Devices Among Generation Z in Malaysia

Dear respondents,

We are students from Bachelor of Business Administration (Hons) Healthcare Management of Universiti Tunku Abdul Rahman (UTAR), currently conducting a final year project research study regarding the **adoption intention of wearable healthcare devices among Generation Z in Malaysia**. Your participation in answering this questionnaire is much appreciated to help us complete the study. We appreciate your time in completing the survey. All the information provided will be treated as confidential and private. The survey is solely for academic research purposes.

If you have any question or inquiry, kindly to contact our member 014-3881426 (Tong Yi Jia)

**Guidelines for completing this survey*:

1.There are **THREE** sections in this questionnaire. Please answer **ALL** the questions in Section A, B and C.

2.Completion of this questionnaire will take you around 5-10 minutes.

3.The information gather will be treated as private and confidential.

* Indicates required question

PERSONAL DATA PROTECTION STATEMENT

Please be informed that in accordance with Personal Data Protection Act 2010 (PDPA) which came into force on 15 November 2013, Universiti Tunku Abdul Rahman (UTAR) is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

Notice:

1.The purposes for which your personal data may be used are inclusive but not limited to:

- For assessment of any application to UTAR
- For processing any benefits and services
- For communication purposes
- For advertorial and news
- For general administration and record purposes
- For enhancing the value of education
- For educational and related purposes consequential to UTAR
- For the purpose of our corporate governance
- For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/study loan

2.Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

3.Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

4.UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

1.By submitting this form you hereby authorise and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purpose.

2.If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfil our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.

3.You may access and update your personal data by writing to us at [yijia1205@1utar.my].

1. Acknowledgement of Notice *

   Mark only one oval.

   ◯ I have been notified by you and I hereby understood, consented and agreed per UTAR notice

   ◯ I disagree, my personal data will not be processed

2. Are you currently aged between 18-28 years old? *

   Mark only one oval.

   ◯ Yes

   ◯ No

3. Nationality *

   Mark only one oval.

   ◯ Malaysian

   ◯ Non-Malaysian

Section A: Demographic profile

Instruction: For this section, please choose the answer that is most appropriate and tick (√) according to the box applicable. Please tick **ONLY ONE** answer for each question below and kindly complete every question.

4. Gender *

   Mark only one oval.

   ◯ Male

   ◯ Female

5. Race *

Mark only one oval.

- ◯ Chinese
- ◯ Malay
- ◯ Indians
- ◯ Other: _____

6. Age Group *

Mark only one oval.

- ◯ 18 -20 years old
- ◯ 21-23 years old
- ◯ 24-26 years old
- ◯ 27-28 years old

7. Residing State/ Federal Territories *

Mark only one oval.

- ◯ Selangor
- ◯ Kuala Lumpur
- ◯ Putrajaya
- ◯ Perak
- ◯ Johor
- ◯ Pahang
- ◯ Penang
- ◯ Melaka
- ◯ Negeri Sembilan
- ◯ Kedah
- ◯ Perlis
- ◯ Kelantan
- ◯ Terengganu
- ◯ Sarawak
- ◯ Sabah

8. Work Status *

Mark only one oval.

- ◯ Full-time employee
- ◯ Part-time employee
- ◯ Student
- ◯ Unemployed

9. Have you heard of wearable healthcare devices? *

Mark only one oval.

- Yes
- No

Section B: Perceived Usefulness

Please descript your personal opinion of the following statements as objectively as you can. Please choose only **ONE** appropriate number that BEST reflects your agreement with the statement using the Likert scale of 1 to 5.
*Note: "Wearable health devices" are the technology accessories to help monitor the wearer's health data such as heart rate, blood pressure, sleep patterns, and activity. For example, smartwatches, or wristbands.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

10. I think that wearing a wearable healthcare device would be useful in my daily life. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

11. I think that wearing a wearable healthcare device would be helpful to monitor my health. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

12. I think that wearing a wearable healthcare device would enhance my quality of life. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

13. I think that wearing a wearable healthcare device would enhance the convenience to monitor my physical activities. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

14. Overall, I would find wearable healthcare device very useful. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

Section B: Perceived Ease of Use

Please descript your personal opinion of the following statements as objectively as you can. Please choose only **ONE** appropriate number that BEST reflects your agreement with the statement using the Likert scale of 1 to 5.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

15. Learning to use the wearable healthcare device would be easy for me. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

16. My interaction with the wearable healthcare device would be clear and understandable. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

17. It would be easy for me to become skillful at using the wearable healthcare device. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

18. I think the wearable healthcare device is easy to carry. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

19. I have access to the wearable healthcare device anytime. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

20. I have access to the wearable healthcare device everywhere.

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

Section B: Health Belief

Please descript your personal opinion of the following statements as objectively as you can. Please choose only **ONE** appropriate number that BEST reflects your agreement with the statement using the Likert scale of 1 to 5.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

21. I realize that bad living habits will cause harm to my health. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

22. I perceive that bad living habits will cause harm to my health. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

23. I hope I can change my bad habits and thus to minimize damage to health. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

24. I think I can improve my health status effectively in many ways like sports. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

Section C: Adoption Intention

Please descript your personal opinion of the following statements as objectively as you can. Please choose only **ONE** appropriate number that BEST reflects your agreement with the statement using the Likert scale of 1 to 5.

Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

25. I am interested in using the wearable healthcare device. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

26. I plan to adopt the wearable healthcare device in the future. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

27. I will develop healthy habits with the wearable healthcare device in the future. *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly agree

Appendix 3: Pilot Study

Independent Variable: Perceive Usefulness

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.930	.933	5

Independent Variable: Perceive Ease Of Use

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.882	.880	6

Independent Variable: Health Belief

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.795	.807	4

Dependent Variable: Adoption Intention

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.880	.880	3

Appendix 4: Descriptive Analysis

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	117	29.9	29.9	29.9
	Female	274	70.1	70.1	100.0
	Total	391	100.0	100.0	

Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chinese	320	81.8	81.8	81.8
	Malay	33	8.4	8.4	90.3
	Indian	38	9.7	9.7	100.0
	Total	391	100.0	100.0	

Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-20 years old	61	15.6	15.6	15.6
	21-23 years old	242	61.9	61.9	77.5
	24-26 years old	62	15.9	15.9	93.4
	27-28 years old	26	6.6	6.6	100.0
	Total	391	100.0	100.0	

Residing State/ Federal Territories

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Selangor	71	18.2	18.2	18.2
	Kuala Lumpur	46	11.8	11.8	29.9
	Putrajaya	4	1.0	1.0	30.9
	Perak	82	21.0	21.0	51.9
	Johor	60	15.3	15.3	67.3
	Pahang	4	1.0	1.0	68.3
	Penang	31	7.9	7.9	76.2
	Melaka	7	1.8	1.8	78.0
	Negeri Sembilan	11	2.8	2.8	80.8
	Kedah	14	3.6	3.6	84.4
	Perlis	6	1.5	1.5	85.9
	Kelantan	5	1.3	1.3	87.2
	Terengganu	2	.5	.5	87.7
	Sarawak	16	4.1	4.1	91.8
	Sabah	32	8.2	8.2	100.0
	Total	391	100.0	100.0	

Work Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full-time employee	56	14.3	14.3	14.3
	Part-time employee	28	7.2	7.2	21.5
	Student	300	76.7	76.7	98.2
	Unemployed	7	1.8	1.8	100.0
	Total	391	100.0	100.0	

Awareness of wearable healthcare devices

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	336	85.9	85.9	85.9
	No	55	14.1	14.1	100.0
	Total	391	100.0	100.0	

Appendix 5: Reliability Test (Actual Study)

Independent Variable: Perceive Usefulness

Case Processing Summary

		N	%
Cases	Valid	391	100.0
	Excluded[a]	0	.0
	Total	391	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.825	.826	5

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
21.2916	9.110	3.01822	5

Independent Variable: Perceive Ease Of Use

Case Processing Summary

		N	%
Cases	Valid	391	100.0
	Excluded[a]	0	.0
	Total	391	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.820	.820	6

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
25.1432	14.620	3.82367	6

Independent Variable: Health Belief

Case Processing Summary

		N	%
Cases	Valid	391	100.0
	Excluded[a]	0	.0
	Total	391	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.718	.716	4

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
17.7417	4.561	2.13572	4

Dependent Variable: Adoption Intention

Case Processing Summary

		N	%
Cases	Valid	391	100.0
	Excluded[a]	0	.0
	Total	391	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.811	.812	3

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
12.5857	5.136	2.26618	3

Appendix 6: Central Tendencies

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PerceiveUsefulness	391	1.40	5.00	4.2583	.60364
PerceiceEaseOfUse	391	1.33	5.00	4.1905	.63728
HealthBelief	391	1.75	5.00	4.4354	.53393
AdoptionIntention	391	1.00	5.00	4.1952	.75539
Valid N (listwise)	391				

Appendix 7: Correlations Matrix

Correlations

		PerceiveUsefulness	PerceiceEaseOfUse	HealthBelief	AdoptionIntention
PerceiveUsefulness	Pearson Correlation	1	.647**	.527**	.674**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	391	391	391	391
PerceiceEaseOfUse	Pearson Correlation	.647**	1	.507**	.670**
	Sig. (2-tailed)	<.001		<.001	<.001
	N	391	391	391	391
HealthBelief	Pearson Correlation	.527**	.507**	1	.483**
	Sig. (2-tailed)	<.001	<.001		<.001
	N	391	391	391	391
AdoptionIntention	Pearson Correlation	.674**	.670**	.483**	1
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	391	391	391	391

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix 8: Results of Tolerance Effect and Variance Inflation Factors

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.282	.232		-1.217	.224		
	PerceiveUsefulness	.478	.058	.382	8.184	<.001	.528	1.893
	PerceiceEaseOfUse	.447	.055	.377	8.182	<.001	.543	1.840
	HealthBelief	.128	.058	.091	2.190	.029	.675	1.483

a. Dependent Variable: AdoptionIntention

Appendix 9: Multiple Linear Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.744[a]	.554	.550	.50654

a. Predictors: (Constant), HB_Average, PEOU_Average, PU_Average

b. Dependent Variable: AI_Average

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	123.246	3	41.082	160.115	<.001[b]
	Residual	99.296	387	.257		
	Total	222.542	390			

a. Dependent Variable: AI_Average

b. Predictors: (Constant), HB_Average, PEOU_Average, PU_Average

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	-.282	.232		-1.217	.224	-.738	.174
	PU_Average	.478	.058	.382	8.184	<.001	.363	.593
	PEOU_Average	.447	.055	.377	8.182	<.001	.339	.554
	HB_Average	.128	.058	.091	2.190	.029	.013	.243

a. Dependent Variable: AI_Average