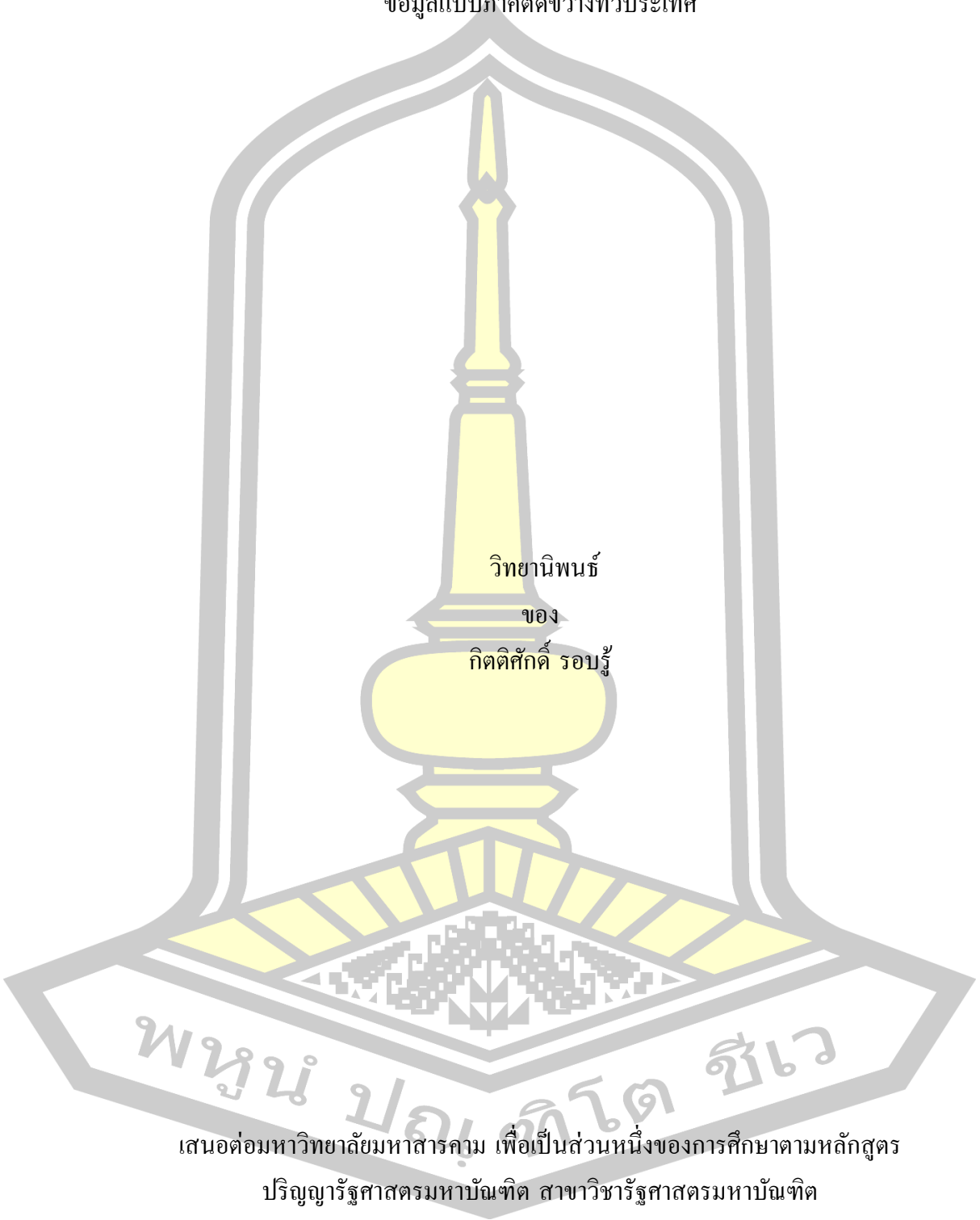
# Internet Use for Health-Related Purposes Among Older People in Thailand: A Nationwide Cross-Sectional Data Analysis

Kittisak Robru

A Thesis Submitted in Partial Fulfillment of Requirements for
degree of Master of Political Science in Politics and Government
March 2024

# การใช้อินเทอร์เน็ตเพื่อวัตถุประสงค์ด้านสุขภาพของกลุ่มผู้สูงอายุในประเทศไทย: การวิเคราะห์ข้อมูลแบบภาคตัดขวางทั่วประเทศ



วิทยานิพนธ์

ของ

กิตติศักดิ์ รอบรู้

เสนอต่อมหาวิทยาลัยมหาสารคาม เพื่อเป็นส่วนหนึ่งของการศึกษาตามหลักสูตร

ปริญญารัฐศาสตรมหาบัณฑิต สาขาวิชารัฐศาสตรมหาบัณฑิต

มีนาคม 2567

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The examining committee has unanimously approved this Thesis, submitted by Mr. Kittisak Robru , as a partial fulfillment of the requirements for the Master of Political Science Politics and Government at Mahasarakham University

Examining Committee

..... Chairman
(Asst. Prof. Wanida Phomlha , Ph.D.)

..... Advisor
( Prasongchai Setthasuravich , Ph.D.)

..... Committee
( Chinnawat Chueasraku , Ph.D.)

..... External Committee
(Asst. Prof. Grichawat Lowatcharin , Ph.D.)

Mahasarakham University has granted approval to accept this Thesis as a partial fulfillment of the requirements for the Master of Political Science Politics and Government

..... .....
(Asst. Prof. Cherngcharn Chongsomchai ) (Assoc. Prof. Krit Chaimoon , Ph.D.)
Dean of The College of Politics and Governance Dean of Graduate School

**TITLE** Internet Use for Health-Related Purposes Among Older People in Thailand: A Nationwide Cross-Sectional Data Analysis

**AUTHOR** Kittisak Robru

**ADVISORS** Prasongchai Setthasuravich , Ph.D.

**DEGREE** Master of Political Science **MAJOR** Politics and Government

**UNIVERSITY** Mahasarakham University **YEAR** 2024

## ABSTRACT

This study investigates Internet use among older adults in Thailand, focusing on identifying the most common health-related purposes and examining how socio-demographic factors such as age, gender, education level, income, occupation, residence, and trust in using the Internet influence this behavior. Drawing on cross-sectional data from the "Thailand Internet User Behavior Survey 2022" involving 4,652 participants, the study employs descriptive statistics, chi-square tests, and logistic regression analysis to explore the characteristics, Internet usage patterns, and the factors related to Internet use for health-related purposes among older people in Thailand.

The findings reveal that 10.83% of older adults use the Internet for health purposes, predominantly to access health news, followed by exercise, communication with medical experts, and telemedicine. Moreover, the results of the logistic regression analysis show that individuals with higher income, better education, certain occupations, urban residence, and greater trust in internet use are more likely to use the Internet for health-related purposes. These findings offer practical implications for healthcare policy development to foster broader engagement in using the Internet for health-related purposes among older people in Thailand.

Keyword : Older people, Internet use, Health Information, Technology Healthcare, Policy

# ACKNOWLEDGEMENTS

This study entitled “Internet Use for Health-Related Purposes Among Older People in Thailand: A Nationwide Cross-Sectional Data Analysis” has been successfully carried out, thanks to substantial assistance and unwavering support from Prasongchai Setthasuravich, Ph.D., the main thesis supervisor. I would like to express my profound gratitude for this knowledge, advice, and recommendations to improve the quality of this research.

I am also genuinely grateful to the thesis examination committee for their precious time and comments to make this thesis even more solid. Special thanks are given to Asst. Prof. Wanida Phomlha, PhD., chairperson of the thesis examination committee. Again, I would not have made it without the unrivaled academic support and moral guidance of my thesis supervisor, Prasongchai Setthasuravich, Ph.D. I would like to thank another thesis examination committee, Chinnawat Chueasraku, Ph.D., and the committee and external expert, Asst. Prof. Grichawat Lowatcharin, Ph.D., for their constructive comments. Their contributions to my thesis defense and revision are warmly appreciated.

I also owe a debt of gratitude to Mr. Weera Saengsit for his assistance in translating the abstract of this research.

Last but not least, I could not say thank you enough to all my family members, especially my parents, who are behind this milestone in my life. You guys are very kind, supportive, and understanding.

In this final remark, I genuinely hope that this research will benefit relevant government agencies and future researchers interested in this field of study.

Kittisak Robru

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# Chapter 1
# Introduction

The global internet usage landscape is marked by its extensive reach and diverse implications. Internet penetration rates showcase notable disparities, with developed countries generally exhibiting higher access and utilization compared to their developing counterparts (Beilock & Dimitrova, 2003). The advent of mobile internet has been instrumental in bridging access gaps, especially in regions lacking traditional broadband infrastructure. Dominating a large segment of this landscape are social media platforms like Facebook, Instagram, TikTok, and X (formerly known as "Twitter"), which boast extensive global user bases.

Additionally, e-commerce and online services have experienced remarkable growth, driven by the convenience offered by smartphones. Despite these advancements, the digital landscape faces challenges including the digital divide, cybersecurity threats, data privacy concerns, and misinformation. These issues are further compounded by varying degrees of government regulations and censorship, affecting internet freedom and accessibility (Wilner, 2018).

The internet usage landscape among older people is characterized by complex, interwoven trends. A surge in global internet penetration rates, with estimates suggesting that over half of the world's population now has some form of internet access, is particularly noteworthy (König & Seifert, 2020). This increase is largely driven by the proliferation of mobile internet in developing countries, where smartphones are often the most accessible and affordable internet access points (Zhang & Danish, 2019). Concurrently, the availability of broadband and high-speed internet has expanded the range of online activities, like high-definition streaming, gaming, and teleconferencing, primarily in developed countries (Seenivasan & Claypool, 2014).

The use of the internet for health purposes has undergone exponential growth, revolutionizing the accessibility of healthcare information and the delivery of medical services (Callen, 2016). This is largely due to the increased availability of online

health-related information, enabling individuals to learn more about their health conditions, symptoms, and treatment options. Popular websites like WebMD and Mayo Clinic, alongside various health forums, have become essential resources for those seeking medical knowledge (Cigolle et al., 2015). The rise of mobile health applications has further facilitated access to health information, allowing users to monitor health metrics like physical activity, diet, and sleep patterns. This democratization of health information contributes significantly to raising public health awareness and promoting preventive healthcare (Sieck et al., 2021). Telemedicine, especially highlighted during the COVID-19 pandemic, has become a vital aspect of internet-based health services. It offers patients the ability to consult healthcare professionals through video calls, chats, or emails, enhancing medical care accessibility, particularly in remote areas (Hau et al., 2020). The widespread adoption of electronic health records (EHRs) and online patient portals has also improved care continuity, patient engagement, and coordination among healthcare providers (Tapuria et al., 2021).

In Thailand, the “Survey of Internet User Behavior 2022”, conducted by the Electronic Transactions Development Agency (ETDA), reveals significant integration of internet technology within the healthcare domain, altering the way older adults interact with health services and information. These demographic exhibits substantial engagement with digital health resources, indicating a shift in their approach to health management in the digital era.

A notable 75.99% of older adults in Thailand actively seek health-related information online, reflecting a transition from passive recipients of healthcare to well-informed, active participants (Fox et al., 2017). Furthermore, 35.03% of the older population is involved in online activities related to exercise, health tracking, and assessment, highlighting an increased awareness of the importance of physical activity and routine health monitoring. The trend of booking medical appointments online (31.70%) demonstrates the convenience and efficiency that digital solutions offer in healthcare management. This is particularly beneficial for those with limited mobility or residing in remote areas. Additionally, 24.74% of older adults engage in online consultations with healthcare professionals, signifying the rising popularity of

telemedicine (Gentry et al., 2019). Finally, 20.29% of the older Thai population use online platforms for comprehensive health services, reflecting a growing trust and reliance on digital healthcare (Mace et al., 2022).

These trends among older adults in Thailand underscore a significant embrace of digital technology in healthcare, enhancing accessibility, efficiency, and empowering them to manage their health proactively. This signifies a crucial evolution in the healthcare sector, with digital tools becoming integral to care provision, improving health outcomes, and offering a more patient-centric approach. However, the use of the internet for health purposes also poses challenges. The abundance of health information online can lead to misinformation and self-diagnosis, potentially causing harm if individuals rely on unverified sources (Swire-Thompson & Lazer, 2020). Additionally, the privacy and security of sensitive health data remain significant concerns, particularly with the increasing use of digital health records and telemedicine services (AlOsail et al., 2021). Despite these challenges, the role of the internet in healthcare continues to expand, offering promising opportunities for improving health outcomes, enhancing patient care, and making healthcare more accessible and efficient globally.

This thesis explores the intersection of these trends and challenges, delving into the internet usage for health purposes among older people in Thailand. By analyzing nationwide cross-sectional data, this research aims to uncover the most common health-related purposes of internet use by this demographic and examine the relationship between socio-demographic characteristics and health-related internet use. This study not only contributes to the understanding of digital health trends among the elderly in Thailand but also provides insights into the broader implications of internet use in healthcare, underscoring the significance of this research in the evolving landscape of digital health. This thesis is predicated on the increasing integration of internet technology in healthcare and its profound impact on the elderly population in Thailand. To elucidate this evolving phenomenon, the study is structured around key research questions and objectives as follows:

**1.1 Research Questions:**

1. What are the primary health-related purposes for which the elderly in Thailand utilize the internet?
2. How do socio-demographic factors such as age, gender, education level, and income influence the use of the internet for health-related purposes among the elderly in Thailand?

**1.2 Research Objectives:**

1. To identify the most common health-related purpose for which the internet is used by older people in Thailand.
2. To examine the relationship between socio-demographic factors and health-related internet use among the older people in Thailand.

**1.3 Research Scope**

1. Scope of Content: This research is centered on the elderly population in Thailand who use the internet for health-related purposes. It thoroughly investigates socio-demographic factors such as age, gender, education level, and income to comprehend their impact on the use of the internet for health purposes. The study aims to uncover patterns and correlations that illustrate how these factors affect the elderly's engagement with online health resources and services.
2. Demographic Scope: The main participants of this study are elderly individuals who voluntarily responded to the “Survey of Internet User Behavior in Thailand (Thailand Internet User Behavior) 2022,” conducted by the Electronic Transactions Development Agency (ETDA). Out of the total 46,348 responses, the study focuses on the subgroup of respondents aged 60 and above. This targeted sample offers a rich dataset for analyzing internet usage behaviors specific to the elderly demographic in Thailand.
3. Geographical Scope: This study spans across Thailand, encompassing a geographically varied sample to ensure a comprehensive and representative analysis. By including respondents from diverse regions, the research aims to capture the range of socio-demographic differences and internet usage patterns

among the elderly, reflecting the varied nature of Thailand's older population and their engagement with digital health services.

4. Temporal Scope: The research is conducted over three months from November 2023 to January 2024. This period covers data collection, analysis, and the compilation of findings. The selected timeframe is designed to allow a detailed examination of current trends and practices in the use of the internet for health purposes among the older people, facilitating a thorough data analysis and reporting process.

**1.4 Expected Contributions**

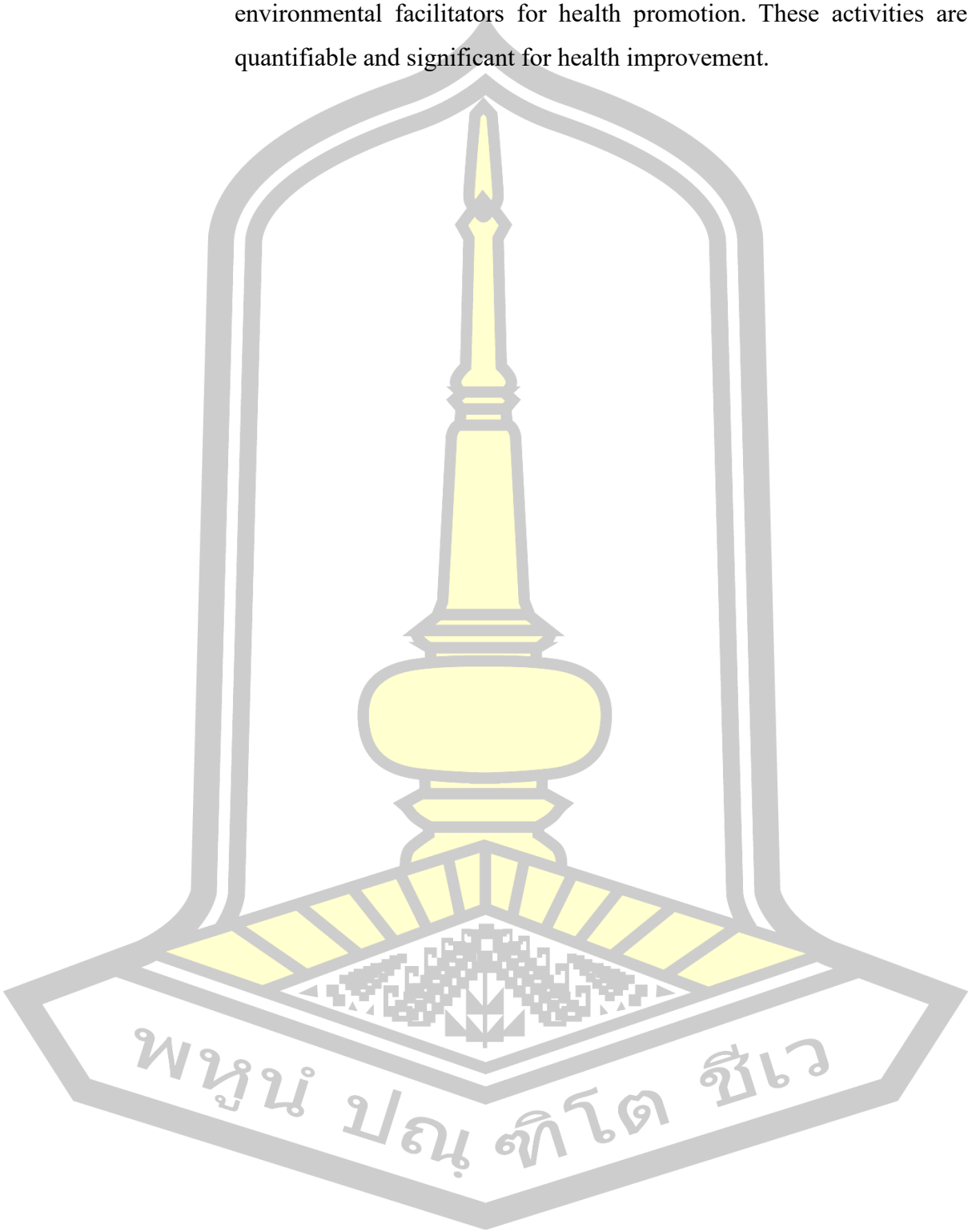
This thesis explores how older people in Thailand use the internet for health purposes. It aims to make significant contributions to both academic research and practical applications. The study is expected to provide valuable insights in the following three areas:

1. This thesis will provide in-depth insights into how the elderly population in Thailand utilizes the internet for health-related purposes. By identifying the specific ways in which this demographic engages with digital health resources, the study will contribute significantly to the body of knowledge on the intersection of aging, technology, and healthcare.
2. The research will elucidate the relationship between socio-demographic characteristics and the use of the internet for health purposes among the elderly. This aspect of the study will aid in understanding the disparities and patterns in digital health usage, contributing to more targeted and effective digital health strategies for older people in Thailand.
3. The findings of this thesis are expected to have practical implications for policy-making and healthcare practices. By shedding light on how the elderly in Thailand interact with digital health technologies, the research could inform the development of more accessible, user-friendly, and relevant digital health services and policies tailored to the needs and capabilities of the older population.

**1.5 Definition of Terms**

1. Older People: This term refers to individuals of both genders who are aged 60 years and above. In this thesis, several terms can be used to refer to older people, such as elderly population, elderly individuals, older adults, and older persons.
2. Using the Internet for Health Purposes: This involves utilizing online platforms that offer health-related information and serve as forums for public relations and exchanging opinions on topics like diseases, medications, treatments, exercises, and pharmaceuticals. In the context of this research, the use of the internet for health purposes encompasses a variety of activities, which include, but are not limited to:
    - Booking an Appointment for Online Medical Services: This denotes the process of arranging medical consultations, advice, treatments, and follow-ups through electronic means between various medical facilities, such as homes, community clinics, Subdistrict Health Promoting Hospitals, or other network healthcare facilities. This also includes recording these services in a hospital information system.
    - Telemedicine: This refers to the delivery of public health services by medical professionals using technology and video conferencing to exchange information useful for diagnosis, treatment, and disease prevention, without being constrained by time or location.
    - Contacting/Receiving Health Advice from Medical Experts: This involves using media channels to provide advice, explanations, and instructions related to disease diagnosis and medical treatment, either between medical professionals or between patients and their relatives.
    - Following News/Searching for Health Information: This term describes an individual's ability to actively seek, access, understand, scrutinize, and discern health information, leading to informed decisions about behavior changes and the appropriate use of health services and products.
    - Exercise, Monitoring, and Evaluation Regarding Health: This encompasses activities aimed at changing personal behavior to achieve

physical, mental, and emotional well-being, supported by societal and environmental facilitators for health promotion. These activities are quantifiable and significant for health improvement.



# Chapter 2
# Literature Review

## 2.1 Introduction

This chapter presents a comprehensive literature review to examine the complex landscape of internet use for health purposes. This exploration begins with an assessment of global trends, highlighting how digital health resources are increasingly shaping healthcare engagement worldwide. Special attention is given to the usage among older persons, delving into how this demographic navigates the digital health space. The chapter then scrutinizes the influence of various sociodemographic factors such as age, gender, and socioeconomic status on internet use for health purposes. The review also focuses on the outcomes of health-related internet use, exploring its impact on health behaviors and decision-making processes. Finally, it identifies and discusses the gaps in current literature, setting a directive for the research to address these unexplored areas. This chapter aims to establish a thorough understanding of the dynamics of internet use for health purposes, especially among older persons, within the broader context of global trends and sociodemographic influences.

## 2.2 Global Trends in Internet Use for Health Purposes

The global escalation in using the internet for health-related purposes signifies a considerable and rapidly evolving trend, with a pronounced emphasis among the older demographic. This evolution in healthcare interaction is fueled by a myriad of factors such as age, gender, socioeconomic status, and geographic location, highlighting a paradigm shift towards digital healthcare engagement (Alam et al., 2019; Sumaedi & Sumardjo, 2020). This trend is defined by an increased reliance on the internet for gaining health information, facilitating diagnoses, and garnering community support, a movement that is further propelled by the ubiquity of mobile technology and the expansive reach of social media platforms. The utilization of digital health resources offers manifold advantages, most notably the convenience of accessing extensive information and services from home.

Despite these benefits, this digital revolution is not without its challenges. Issues such as the digital divide, misinformation, and a lack of digital literacy are particularly pronounced among the elderly (Heart & Kalderon, 2011; AlGhamdi & Moussa, 2011). The increasing adoption of online health services by the elderly underscores the need for well-devised health information strategies, digital literacy initiatives, and inclusive policies. Addressing these issues necessitates a collaborative effort between government bodies and healthcare providers to develop effective interventions that cater to the unique needs of the elderly, especially in utilizing digital health resources.

A significant hurdle in this domain is the digital divide. Despite a general increase in internet accessibility, a considerable segment of the elderly population, particularly in rural areas, remains disadvantaged due to a lack of necessary skills and technology to effectively use digital health platforms (Alam et al., 2019). Additionally, concerns about privacy and security may deter elderly individuals from fully embracing these digital solutions. Furthermore, the prevalence of misinformation on the internet poses a serious risk. The vast array of online information, not all of which is accurate or reliable, can lead to confusion, misdiagnosis, and incorrect treatments, thereby posing significant health risks to the elderly population. It is imperative to ensure that this demographic has access to reliable and trustworthy information through targeted health information campaigns (AlGhamdi & Moussa, 2011).

Another crucial aspect is digital literacy. A substantial number of elderly individuals may lack experience or familiarity with technology, hindering their ability to navigate online health resources effectively. Implementing educational programs that focus on digital literacy for the elderly can greatly facilitate their engagement with digital health resources, enabling them to harness the benefits of the digital revolution.

In conclusion, the growing utilization of digital health resources among older people has the potential to significantly transform healthcare engagement. However, the realization of this potential is contingent upon addressing the prevailing challenges to ensure equitable access to digital health resources.

**2.3 Internet Use Among Older People for Health Purposes**

The internet's role as a critical tool in health management for the elderly has grown substantially, profoundly influencing their health behaviors and attitudes. Studies such as those by Ybarra and Suman (2005) and Koo et al. (2016) have demonstrated that access to online health information significantly impacts the health-related decisions of older adults, resulting in reduced anxiety, enhanced self-efficacy, and more informed choices. These shifts are particularly significant in light of demographic changes and the growing health consciousness among the aging population. However, the degree of internet use for health purposes shows considerable variation among different segments of the elderly. Research by AlGhamdi and Moussa (2011) and Alam et al. (2019) highlights that factors like gender, education level, income, and urban versus rural residence are crucial in determining older adults' engagement with online health resources. The adoption of health-related Information and Communication Technologies (ICT) by older adults also varies, as shown by Heart and Kalderon (2011). They identified various elements, including accessibility, support, age, marital status, education, and overall health status, as key in influencing ICT adoption among older people.

The significance of intention, knowledge, descriptive norm, and perceived health threats in shaping internet use for health purposes was further emphasized in Sumaedi and Sumardjo's (2020) study. These elements highlight the complex nature of the relationship between the elderly and online health information. Adding to this intricacy, Hung et al. (2020) noted a rising trend in Health Information Technology (HIT) usage among older adults in the United States. This uptrend is more pronounced in younger seniors, those with higher education and income levels, insurance coverage, and good health. Conversely, Choi (2011) examined the link between the use of health services and internet use for health-related activities among older adults, finding a positive correlation between general health service usage and increased online health-related engagement.

Despite these encouraging trends, significant disparities in internet use among older people persist, as shown in studies by Duplaga (2021) and Shahrabani and Mizrachi (2016), indicating a digital divide impacting health outcomes in older adults.

Duplaga (2021) found that internet use was not consistently associated with favorable lifestyle patterns or higher self-rated health among older Polish adults, suggesting that the advantages of online health resources are not evenly experienced across the elderly population.

In summary, the integration of the internet into health management practices of older people is a complex and multifaceted phenomenon, influenced by a myriad of demographic, socio-economic, and individual factors. While an increase in internet and health information technology use among the elderly is evident, there is a clear necessity for more accessible, user-friendly, and customized online health services and information. As the digital landscape continues to evolve, addressing the digital divide becomes increasingly vital, ensuring that all older adults can fully benefit from the internet's potential in managing their health and well-being.

**2.4 Sociodemographic Factors and Internet Use**

The use of the internet for health-related purposes is significantly shaped by an intricate interplay of sociodemographic factors. Studies from different regions, including those by Koo, Lu, and Lin (2016) in Taiwan and AlGhamdi and Moussa (2011) in Saudi Arabia, have illuminated the correlation between higher levels of education and economic status and increased internet use for health information. This correlation suggests a notable disparity in access and utilization based on education and income levels, indicating that individuals with higher education and economic stability are more likely to engage with online health resources.

Geographical location also emerges as a critical factor influencing internet usage, especially in the context of accessing health services. Research by Alam et al. (2019) in Australia highlights the challenges faced by individuals in regional, rural, and remote areas in eHealth service access, influenced by factors such as household size, internet availability, and digital literacy. This geographical divide suggests that urban dwellers generally have better access to health-related online information than their rural counterparts.

Additionally, the health status of individuals plays a pivotal role in their use of the internet for health purposes. A study by Duplaga (2021) in Poland pointed out that internet use was not uniformly linked with favorable lifestyle patterns or higher self-rated health among older persons, indicating that health status significantly influences how and why people search for health information online.

Cultural and personal factors also impact the use of health-related Information and Communication Technologies (ICT), as evidenced by Heart and Kalderon's (2011) study. This research shows that in the context of older persons, factors like marital status, education level, and overall health condition moderate the use of health-related ICT, underlining the necessity for accessible and customized health technologies for this demographic.

Socioeconomic status further determines access to online health resources. The work of Shahrabani and Mizrachi (2016) revealed a socioeconomic divide in the utilization of digital health resources, with wealthier populations tending to use online health services more frequently. This finding is supported by Hung et al. (2020), who observed a growing trend in Health Information Technology use among older persons in the U.S., particularly among those with higher education, income, and better health status.

Gender dynamics also play a role in these disparities, with varying patterns of internet use for health information observed between men and women. Furthermore, age-related factors are influential, with younger populations generally showing higher levels of engagement, though recent trends indicate increasing use among older demographic groups.

In summary, the utilization of the internet for health purposes is intimately connected to a range of sociodemographic factors including education, income, geographical location, health status, cultural background, gender, and age. These factors not only determine the extent of internet use but also shape how individuals interact with and benefit from online health information.

**2.5 Health-Related Internet Use and Outcomes**

The influence of health-related internet use on user outcomes is a multifaceted topic, significantly shaped by a wide range of sociodemographic and individual factors, as demonstrated in various studies. Ybarra and Suman (2005) underscored the importance of reliable online disease information in alleviating user anxiety, boosting self-efficacy, and potentially reducing the dependence on ambulatory care services. This finding suggests that access to high-quality health information online can facilitate more informed and proactive health management decisions. In Taiwan, the research by Koo et al. (2016) emphasized the impact of gender on online health information-seeking behavior, indicating that men and women are influenced by distinct factors such as educational level, living arrangements, exercise habits, age, marital status, and income.

In Saudi Arabia, AlGhamdi and Moussa (2011) discovered that health-related internet use was more prevalent among specific demographic groups, notably among women, individuals with higher education, the employed, and those in higher income brackets, signifying a substantial socio-demographic influence on health-related internet utilization. Conversely, Duplaga (2021) identified a digital divide in Poland, where internet use was not consistently associated with favorable lifestyle patterns or higher self-rated health among older persons, implying that access to online health resources does not uniformly translate into improved health outcomes.

The trend of Health Information Technology (HIT) use in the U.S., particularly among older adults, has been on the rise, as indicated by Hung, Lyons, and Wu (2020). Influencing factors for this trend include age within the older adult group, education level, income, insurance coverage, and overall health condition. Choi (2011) established a link between the utilization of general health services and an increase in health-related internet activities, pointing to disparities in HIT usage among different health service user groups. Shahrabani and Mizrachi (2016) observed that wealthier populations tended to use online health services more frequently, with factors like perceived ease of use and reliability being influential, indicating that socio-economic status plays a crucial role in the utilization of online health services.

This observation is complemented by the findings of Heart and Kalderon (2011), which revealed that among older persons, the adoption of health-related ICT is influenced by marital status, education level, and health condition, emphasizing the necessity for user-friendly and accessible health technologies for this demographic. Additionally, geographical location significantly impacts eHealth service access, as studied by Alam et al. (2019), with individuals in rural or remote areas facing greater challenges due to limited internet access and lower digital literacy levels. This geographical disparity contributes to the uneven distribution of health-related internet benefits.

In conclusion, the use of the internet for health purposes and its resulting outcomes are determined by a myriad of factors, including gender, education, income, socio-economic status, geographical location, and individual health status. These diverse influences underscore the complexities in ensuring equitable access and effective utilization of digital health resources. It highlights the importance of developing comprehensive strategies to address these disparities, ensuring that all population segments can benefit from the digital transformation in health information and services.

**2.6 Research Gaps**

Based on the literature review provided, several key gaps in knowledge can be identified:

1. The literature review indicates that while there is knowledge about the general use of the internet for health purposes, there is a lack of specific understanding of the exact health-related purposes for which older persons in Thailand use the internet. This includes what type of health information or services they are seeking, such as disease information, telemedicine, online pharmacy services, or health monitoring. This study will fill this gap by identifying these specific purposes, contributing to a more detailed understanding of older persons' health-related internet use.
2. The review points out that factors like education, income, gender, and geographical location play a significant role in internet use for health purposes. However, there seems to be a lack of detailed exploration of how

these factors interplay and specifically affect older persons in Thailand. This research aims to examine these relationships, considering the unique socio-demographic context of Thailand. This will provide valuable insights into how different socio-demographic groups among older persons are using the internet for health purposes and the barriers they may face.

**2.7 Conclusion**

This chapter has provided a detailed exploration of the various facets of internet use for health purposes, with a particular focus on older people. The comprehensive literature review conducted herein has highlighted significant global trends, emphasizing how digital health resources are becoming increasingly integral in healthcare management and decision-making processes. It observed that while the internet offers numerous opportunities for enhanced health management and empowerment, its utilization is significantly influenced by a variety of sociodemographic factors. These factors, including age, gender, education, income, and geographical location, create a diverse landscape in which the benefits and accessibility of digital health resources are not uniformly experienced. The digital divide, particularly evident among older persons and those in rural or underserved areas, presents a significant challenge to achieving equitable access to these resources. Moreover, the review underscored that while health-related internet use can lead to positive outcomes such as improved health literacy and proactive health behaviors, these benefits are not universal. Factors such as digital literacy, the reliability of online health information, and personal health status play crucial roles in determining the impact of internet use on health outcomes. Identifying the gaps in the existing literature, particularly concerning the specific needs and challenges faced by older persons in Thailand, this chapter sets the foundation for the research questions and objectives of the study. The insights gained from this review are instrumental in guiding the subsequent research phases, aiming to develop more targeted and effective strategies for enhancing the use of digital health resources among older people. By addressing these gaps, the study aims to contribute to the broader goal of ensuring that all individuals, regardless of their sociodemographic background, can benefit from the advancements in digital health.

# Chapter 3
# Research Methodology

## 3.1 Introduction

This chapter presents the research methodology, focusing on analyzing internet use for health purposes among older individuals in Thailand. Utilizing the "Thailand Internet User Behavior Survey 2022" by the Electronic Transactions Development Agency (ETDA), the study adopts a cross-sectional design to capture a diverse demographic. The methodology includes a detailed examination of dependent and independent variables, addressing aspects such as gender, age, income, education, and internet confidence. Hypotheses are formulated to explore the influence of these sociodemographic factors on digital health engagement. Logistic regression analysis is employed to analyze the data, with a focus on understanding the nuanced patterns of internet usage for health among the older population in Thailand.

## 3.2 Research Design and Data Sources

The research employs a comprehensive cross-sectional design to evaluate the use of the internet for health-related purposes among older individuals in Thailand. It utilizes the "Thailand Internet User Behavior Survey 2022," a comprehensive dataset provided by the Electronic Transactions Development Agency (ETDA). This dataset encompasses a broad and diverse spectrum of internet users across Thailand, representing a wide array of demographics. The survey has been meticulously designed to target different segments of the Thai population, ensuring balanced coverage across various age groups, regions, and provinces. The sampling process was systematically controlled and weighted, reflecting the proportional distribution of internet users across the country, as corroborated by the findings of the "Household Information and Communication Technology Use Survey 2021" conducted by the National Statistical Office.

Data collection for the survey was primarily conducted through online methods. The questionnaire was distributed via email using the ETDA's database and was further promoted through banners on websites and social media platforms such as Facebook, LINE@, and Instagram. Additionally, the survey received sponsorship

from various government and private agencies, enhancing access and participation rates. In certain areas, targeted efforts were employed to ensure the questionnaire reached a broad spectrum of internet users. This strategy ensured a comprehensive dataset with a wide variety of responses. The survey was conducted from April to July 2022, inviting voluntary participation and successfully garnering responses from 46,348 individuals.

For the purpose of this thesis, the focus was narrowed to a subgroup dataset pertaining to older persons. Data related to individuals aged 60 years and older were meticulously extracted from the main dataset. This extraction resulted in a significant sample size of 4,652 older people, providing a rich and targeted dataset for the analysis of health-related internet behavior among older persons in Thailand. This targeted approach allows for an in-depth exploration of digital health engagement within this demographic, offering valuable insights into the unique patterns, preferences, and challenges in the context of internet use for health-related activities. This comprehensive research design forms the foundation of our study, aiming to unravel the complexities and nuances of digital health engagement among older persons in Thailand.

**3.3 Potential Variables**

In this thesis, it delves into the impact of technology on health behavior, particularly among older persons in Thailand, a demographic increasingly turning to digital health services. To understand this dynamic, we have identified a set of dependent variables representing various health-related online activities. Examining these variables will provide insights that could inform future digital health strategies and policies.

3.3.1 Dependent Variable:

There is one dependent variable, the variable “Internet Use for Health Purposes (Activity Health)”, it determines whether respondents have utilized the internet primarily for accessing health-related information and services over the past year. This includes activities like seeking online public health services or looking up

health information, giving an overview of general health engagement online (See Table 1)

Table 1 Description of Dependent Variable

| Dependent Variable | Description |
|---|---|
| Internet Use for Health Purposes (Activity Health) | Binary variable (Yes/No) from the question: “During the past 1 year, have you used the internet primarily for receiving online public health services and health information such as following news/searching for health information, etc.?” |

3.3.2 Independent Variables:

Table 2 outlines the operational definitions for the independent variables being studied. These variables are crucial for understanding how different factors may influence the internet usage patterns among older people in Thailand.

First, Gender is bifurcated into Male and Female categories. Coded as 0 for females and 1 for males, this variable distinguishes between the two genders to examine if there are differences in internet use for health purposes based on gender.

Second, Age, this variable categorizes participants into three groups based on their age: “young old” (60-64 years), “middle old” (65-74 years), and "very old" (75 years and older). This classification, inspired by Kramanon and Gray (2015), is tailored to the Thai context, recognizing 60 as the onset of older age (unlike the more common age 65 used in many developed countries) and reflecting Thailand's average life expectancy of around 75 years.

Third, Income is categorized into seven brackets, ranging from less than 15,001 Baht to over 90,000 Baht. By segmenting income this way, the research can investigate if and how financial status influences internet usage for health purposes. It could provide insights into whether higher income groups have more access to or engagement with digital health resources.

Fourth, Education Level is another pivotal variable, spanning from below primary school to Ph.D. levels, this categorization helps to analyze how educational attainment impacts older adults' engagement with online health resources.

Fifth, Occupation includes a wide range of employment statuses from unemployment to various job roles, including public officials, private employees, business owners, and pensioners or retirees, among others. This variable seeks to understand if occupational background influences internet use for health purposes.

Sixth, the Residence variable, distinguishing between Urban and Rural settings, is significant. It takes into account the geographic and infrastructural disparities that might exist in internet access and usage. Urban and rural residents may face different challenges and opportunities when it comes to utilizing online health services.

Lastly, the variable of Confidence Level in Using the Internet (Trust), rated on a scale from 0 (not confident at all) to 3 (most confident), is critical. This self-assessed confidence level is a potential indicator of how comfortable and skilled the elderly feel in navigating the internet for health-related purposes. It can highlight if confidence, or the lack thereof, is a major factor influencing the adoption and usage of online health resources among older people.

These variables are integral to the study as they encompass a range of activities and characteristics that influence health-related internet usage among older persons in Thailand. By analyzing these variables, it can gain a comprehensive understanding of how digital health tools are used and what factors drive their use.

Table 2 Operational Definitions of Independent Variables

| Independent Variables | Categories/Operational Definitions |
|---|---|
| 1. Gender | 0: Female |
| | 1: Male |
| 2. Age* | 1: Young old = 60-64 years old |
| | 2: Middle old = 65-74 years old |
| | 3: Very old = 75 years old and older |
| 3. Income | 0: Less than 15,001 Baht |
| | 1: 15,001 - 30,000 Baht |
| | 2: 30,001 - 45,000 Baht |
| | 3: 45,001 - 60,000 Baht |
| | 4: 60,001 - 75,000 Baht |
| | 5: 75,001 - 90,000 Baht |
| | 6: More than 90,000 Baht |
| 4. Education Level | 0: Below primary school |
| | 1: Lower primary school |
| | 2: Upper primary school |
| | 3: Junior high school |
| | 4: High school/Vocational certificate |
| | 5: Associate degree, Vocational certificate/Diploma |
| | 6: Bachelor's degree |
| | 7: Master's degree |
| | 8: Ph.D. |
| 5. Occupation | 0: Unemployed |
| | 1: Public official |
| | 2: Private employees |
| | 3: Business owners |
| | 4: Freelancers |
| | 5: General laborers or drivers |

| Independent Variables | Categories/Operational Definitions |
|---|---|
| | 6: Students |
| | 7: Butlers or housekeepers |
| | 8: Pensioners or retirees |
| | 9: Farmers |
| | 10: Others |
| 6. Residence (Urban/Rural) | 0: Rural area |
| | 1: Urban area |
| 7. Trust Level in Using the Internet | 0: Not confident at all |
| | 1: Slightly confident |
| | 2: Very confident |
| | 3: Most confident |

Note: * This study categorizes older individuals into three age groups following the classification by Kramanon and Gray (2015): those aged 60-64 as "young old," those aged 65-74 as "middle old," and those aged 75 and older as "very old." The rationale for this classification aligns with the Thai context, where the threshold for being considered "older" begins at 60 years, in contrast to the age of 65 commonly used in many developed countries. Additionally, this categorization reflects the demographic realities in Thailand, where the average life expectancy is approximately 75 years.

### 3.4 Hypotheses Development

Gender and Health-Related Internet Use

Consistent with findings from Ybarra and Suman (2006) and subsequent studies (Lee et al., 2016; AlGhamdi & Moussa, 2012; Heart & Kalderon, 2013; He et al., 2022; Hung et al., 2020; Choi, 2011; Shahrabani & Mizrachi, 2016). Hypothesis 1 (H1) posits that there is a significant gender-based difference in using the Internet for health purposes.

### Age and Health-Related Internet Use

Drawing from literature that highlights the increased likelihood of older adults, especially those over 60, to seek health information online (Ybarra & Suman, 2006; Lee et al., 2016; AlGhamdi & Moussa, 2012; Alam et al., 2019; Heart & Kalderon, 2013; He et al., 2022; Hung et al., 2020; Choi, 2011; Shahrabani & Mizrachi, 2016), Hypothesis 2 (H2) suggests that age significantly influences the use of the Internet for health purposes. The hypothesis delineates those younger elderly (e.g., 60-74 years) are expected to use the Internet more for health-related information than older seniors (e.g., above 75 years), potentially due to greater familiarity and comfort with technology.

### Income and Health-Related Internet Use

Reflecting findings from studies that associate higher income levels with a greater likelihood of using the Internet for health purposes (Ybarra & Suman, 2006; Lee et al., 2016; AlGhamdi & Moussa, 2012; Alam et al., 2019; Heart & Kalderon, 2013; He et al., 2022; Hung et al., 2020; Choi, 2011; Shahrabani & Mizrachi, 2016), Hypothesis 3 (H3) posits that higher income levels are positively correlated with the use of the Internet for health purposes. Elderly individuals with greater financial resources are likely to access more online health services and information, driven by increased access to technology and potentially better health literacy.

### Education Level and Health-Related Internet Use

Supported by literature that links higher educational attainment with more frequent use of the Internet for health information (Ybarra & Suman, 2006; Lee et al., 2016; AlGhamdi & Moussa, 2012; Alam et al., 2019; Heart & Kalderon, 2013; He et al., 2022; Hung et al., 2020; Choi, 2011; Shahrabani & Mizrachi, 2016), Hypothesis 4 (H4) suggests that elderly individuals with higher education levels are more likely to use the Internet for health purposes. This hypothesis is based on the understanding that education enhances one's ability to seek, understand, and utilize online health resources effectively.

Occupation and Health-Related Internet Use

Hypothesis 5 (H5): The likelihood of using the Internet for health-related purposes varies significantly across different occupational groups among the elderly in Thailand. Specifically, it is posited that certain occupations, such as business owners, freelancers, and public officials, may exhibit a higher propensity for using the Internet for health purposes compared to others, such as unemployed individuals, farmers, and general laborers or drivers.

Residence and Health-Related Internet Use

In line with observations about the impact of urbanization on Internet use for health information (AlGhamdi & Moussa, 2012; Alam et al., 2019), Hypothesis 6 (H6) posits that elderly residing in urban areas are more inclined to use the Internet for health purposes than those in rural areas, reflecting differences in access to technology and Internet infrastructure.

Trust in Using the Internet and Health-Related Internet Use

Drawing from studies that associate trust in the Internet with health information-seeking behavior (Lee et al., 2016; Heart & Kalderon, 2013; He et al., 2022; Shahrabani & Mizrachi, 2016), Hypothesis 7 (H7) hypothesizes a positive correlation between trust in using the Internet and the use of the Internet for health purposes. This implies that elderly individuals with higher confidence levels in their Internet.

**3.5 Model Specification**

This study employed logistic regression analysis to explore the relationships between various independent variables and health-related internet usage variables. The model specification detailed here will emphasize the reporting of odds ratios, which provides a more intuitive understanding of the strength and direction of these relationships.

3.5.1 Logistic Regression Model

The logistic regression model is specified as follows:

$$\log\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n \quad (1)$$

Where: $P(Y = 1)$ is the probability of the event (e.g., using the internet for health purposes) occurring. $\beta_0$ is the intercept of the model. $\beta_1, \beta_2, \ldots, \beta_n$ are the coefficients for each independent variable $X_1, X_2, \ldots, X_n$.

3.5.2 Calculation of Odds Ratios

Odds ratios are calculated by exponentiating the coefficients obtained from the logistic regression model:

$$OR_{X_i} = e^{\beta_i} \quad (2)$$

Where: $OR_{X_i}$ is the odds ratio for independent variable $X_i$. $e$ is the base of the natural logarithm. $\beta_i$is the estimated coefficient for $X_i$.

In this research, the odds ratios obtained from each logistic regression model are pivotal for understanding the dynamics of internet use for health-related purposes among older adults in Thailand. These ratios offer a nuanced perspective on the likelihood and propensity of engaging in online health activities in response to changes in various socio-demographic factors. The essence of the analysis lies in interpreting how alterations in each independent variable influence the odds of the dependent variable's occurrence. Specifically, an odds ratio greater than 1 indicates an amplification in the probability of the event (e.g., using the internet for health purposes) as the independent variable increases. This is a crucial indicator of a positive relationship. Conversely, an odds ratio less than 1 denotes a reduction in the likelihood of the event with an increase in the independent variable. An odds ratio equal to 1 means that the independent variable does not affect the odds of the event. Alongside odds ratios, 95% confidence intervals and *p*-values will be reported to assess the statistical significance and reliability of the findings.

### 3.6 Statistical Methods

The statistical analysis employed in analyzing the results can be summarized as follows:

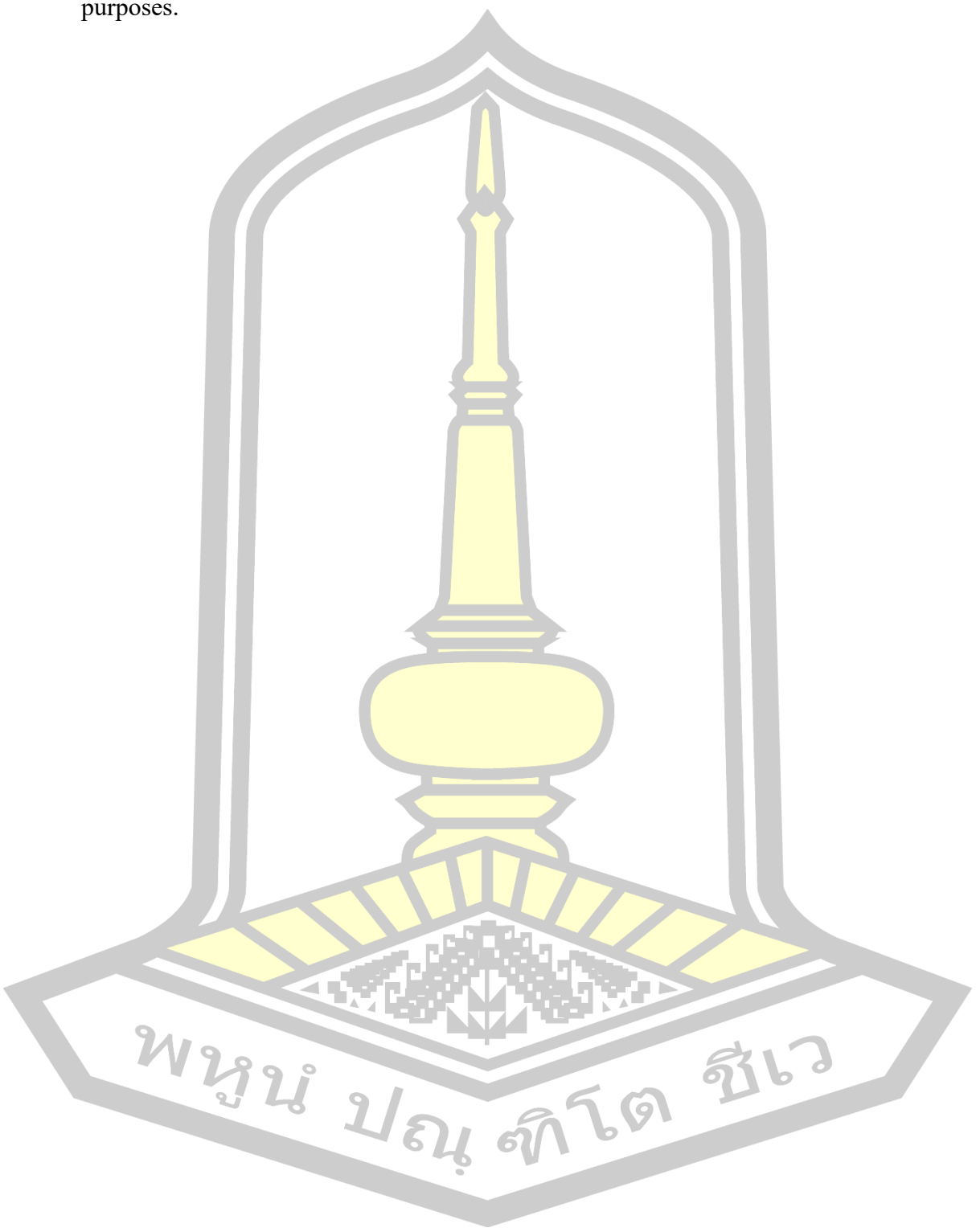
Descriptive Statistics: The use of descriptive statistics to outline the characteristics of the study population. This includes frequencies and percentages to describe the distribution of participants across various categories such as gender, age, income, education level, occupation, residence, and trust level in using the internet. These statistics provide a foundational understanding of the demographic and socioeconomic profile of the older adults in the study.

Chi-Square Test: To examine the differences in the use of the internet for health purposes among different groups based on gender, age, income, education level, occupation, and residence, the chi-square test of independence is utilized. This statistical test assesses whether there is a significant association between categorical variables, allowing for the identification of significant differences in internet use for health purposes across different demographic and socioeconomic factors.

Logistic Regression Analysis: The core of the statistical analysis involves logistic regression, used to explore the factors influencing the use of the internet for health-related purposes among older adults. This analysis provides odds ratios (OR) with corresponding standard errors (SE), 95% confidence intervals (CI), and p-values for each independent variable under consideration, such as gender, age, income, education level, occupation, residence, and trust level in using the internet. Logistic regression is particularly suited to this analysis as it deals with a binary dependent variable (use vs. non-use of the internet for health purposes) and allows for the estimation of the likelihood of internet use for health purposes as a function of various predictors.

Significance Levels: The results are reported with specific attention to statistical significance, indicated by p-values. The conventional thresholds for significance ($p<0.05$, $p<0.01$, $p<0.001$) are adhered to, with significant findings highlighted accordingly to demonstrate the strength and reliability of the associations

found between the independent variables and the use of the internet for health-related purposes.



# Chapter 4
# Results

## 4.1 Characteristics of Older Adults Based on Internet Use for Health Purposes

Table 3 presents the characteristics of 4,652 older adults in relation to their use of the internet for health purposes. Among this group, 504 individuals (10.83%) used the internet for health purposes, while 4,148 (89.17%) did not. Regarding gender, no significant differences were observed in the use of the internet for health purposes (P-value: 0.758). Of the total participants, 2,596 (55.80%) were male, and 2,056 (44.20%) were female. Within the subgroup of internet users for health purposes, 278 (5.98%) were male, and 226 (4.86%) were female, indicating a relatively balanced gender distribution among both users and non-users.

Concerning age, the participants were categorized into three groups: 60-64 years (48.47%), 65-74 years (43.14%), and 75 years and older (8.38%). Internet use for health purposes was slightly more prevalent in the 65-74 age group, with 233 individuals (5.01%) using it, followed by 230 (4.94%) in the 60-64 age group, and 41 (0.88%) in the 75+ age group. However, no significant differences were found across these age groups (P-value: 0.329).

Income level showed a significant difference (P-value: 0.000). The majority of users fell into the “Less than 15,001 baht” income bracket, accounting for 353 (7.59%) of all participants, followed by 101 (2.17%) in “15,001-30,000 Bath” income bracket, 20 (0.43%) in “30,001-45,000 Bath” income bracket, 14 (0.30%) in “45,001-60,000 bath” income bracket, and 10 (0.21%) in “More than 90,000 Bath” income bracket. The “60,001 to 75,000 Baht” and “75,001 to 90,000 Baht” brackets each had 3 participants (0.06%).

Regarding education level, there was a significant difference (P-value: 0.000). The majority of users had completed upper primary school, accounting for 101 (2.17%) of all participants. This was followed by 98 (2.11%) in the high school/vocational certificate group and 83 (1.78%) with a bachelor’s degree. Additionally, 75 participants (1.61%) had completed junior high school, 60 (1.29%) had reached the lower primary school level, 37 (0.80%) held an associate degree or a

vocational certificate/diploma, 32 (0.68%) were below primary school level, 14 (0.30%) had obtained a master's degree, and 4 (0.09%) held a PhD.

Occupation also showed a significant difference (P-value: 0.000). The largest group of users were pensioners or retirees, with 134 individuals (2.88%), followed by farmers with 122 individuals (2.62%), butlers or housekeepers with 80 individuals (1.72%), business owners with 75 individuals (1.61%), freelancers with 24 individuals (0.52%), public officials with 23 individuals (0.49%), private employees with 18 individuals (0.39%), unemployed individuals with 16 individuals (0.34%), general laborers or drivers with 11 individuals (0.24%), and others with 1 individual (0.02%).

In terms of residence, there was a significant difference (P-value: 0.000). A higher proportion of users resided in urban areas (327 individuals, 7.03%) while rural residents (177 individuals, 4.35%).

A significant difference was noted in the level of trust in using the internet (P-value: 0.000). Among non-users, a larger proportion reported low confidence levels in using the internet, with 319 individuals (6.86%) not confident at all and 1,258 individuals (27.04%) slightly confident. In contrast, users of the internet for health purposes showed higher levels of confidence, with 212 individuals (4.56%) very confident and 195 individuals (4.19%) most confident.

Table 3 Characteristics of older adults in Thailand based on internet use for health purposes

| Characteristics | All N=4,652 (100%) | Used Internet for Health Purposes N= 504 (10.83%) | Did Not Use Internet for Health Purposes N=4,148 (89.17%) | P-value |
|---|---|---|---|---|
| **Gender** | | | | **0.758** |
| Male | 2,596 (55.80%) | 278 (5.98%) | 2,318 (49.83%) | |
| Female | 2,056 (44.20%) | 226 (4.86%) | 1,830 (39.34%) | |
| **Age** | | | | **0.329** |
| 60-64 (Young old) | 2,255 (48.47%) | 230 (4.94%) | 2,025 (43.53%) | |
| 65-74 (Middle old) | 2,007 (43.14%) | 233 (5.01%) | 1,774 (38.13%) | |
| 75+ (Very old) | 390 (8.38%) | 41 (0.88%) | 349 (7.50%) | |
| **Income** | | | | **0.000** |
| Less than 15,001 Baht | 3,439 (73.93%) | 353 (7.59%) | 3,086 (66.34%) | |
| 15,001 - 30,000 Baht | 898 (19.30%) | 101 (2.17%) | 797 (17.13%) | |
| 30,001 - 45,000 Baht | 197 (4.23%) | 20 (0.43%) | 177 (3.80%) | |
| 45,001 - 60,000 Baht | 74 (1.59%) | 14 (0.30%) | 60 (1.29%) | |
| 60,001 - 75,000 Baht | 17 (0.37%) | 3 (0.06%) | 14 (0.30%) | |

| Characteristics | All N=4,652 (100%) | Used Internet for Health Purposes N= 504 (10.83%) | Did Not Use Internet for Health Purposes N=4,148 (89.17%) | P-value |
|---|---|---|---|---|
| 75,001 - 90,000 Baht | 8 (0.17%) | 3 (0.06%) | 5 (0.11%) | |
| More than 90,000 Baht | 19 (0.41%) | 10 (0.21%) | 9 (0.19%) | |
| **Education Level** | | | | **0.000** |
| Below primary school | 494 (10.62%) | 32 (0.68%) | 462 (9.93%) | |
| Lower primary school | 987 (21.22%) | 60 (1.29%) | 927 (19.93%) | |
| Upper primary school | 1,115 (23.97%) | 101 (2.17%) | 1,014 (21.80%) | |
| Junior high school | 642 (13.80%) | 75 (1.61%) | 567 (12.19%) | |
| High school/Vocational certificate | 653 (14.04%) | 98 (2.11%) | 555 (11.93%) | |
| Associate degree, Vocational certificate/Diploma | 240 (5.16%) | 37 (0.80%) | 203 (4.36%) | |
| Bachelor's degree | 438 (9.42%) | 83 (1.78%) | 355 (7.63%) | |
| Master's degree | 70 (1.50%) | 14 (0.30%) | 56 (1.20%) | |
| Ph.D. | 13 (0.28%) | 4 (0.09%) | 9 (0.19%) | |
| **Occupation** | | | | **0.000** |
| Unemployed | 176 | 16 | 160 | |

| Characteristics | All N=4,652 (100%) | Used Internet for Health Purposes N= 504 (10.83%) | Did Not Use Internet for Health Purposes N=4,148 (89.17%) | P-value |
|---|---|---|---|---|
| | (3.78%) | (0.34%) | (3.44%) | |
| Public officials | 128 (2.75%) | 23 (0.49%) | 105 (2.26%) | |
| Private employees | 94 (2.02%) | 18 (0.39%) | 1.63 (76%) | |
| Business owners | 356 (7.65%) | 75 (1.61%) | 281 (6.04%) | |
| Freelancers | 132 (2.84%) | 24 (0.52%) | 108 (2.32%) | |
| General laborers or drivers | 226 (4.86%) | 11 (0.24%) | 215 (4.62%) | |
| Students | 15 (0.32%) | 0 (0.00%) | 15 (0.32%) | |
| Butlers or housekeepers | 573 (12.32%) | 80 (1.72%) | 493 (10.60%) | |
| Pensioners or retirees | 646 (13.89%) | 134 (2.88%) | 512 (11.01%) | |
| Farmers | 2,285 (49.12%) | 122 (2.62%) | 2,163 (46.50%) | |
| Others | 21 (0.45%) | 1 (0.02%) | 20 (0.43%) | |
| **Residence** | | | | **0.000** |
| Rural | 2,794 (68.63%) | 177 (4.35%) | 2,617 (64.28%) | |
| Urban | 1,858 (39.94%) | 327 (7.03%) | 1,531 (32.91%) | |

| Characteristics | All N=4,652 (100%) | Used Internet for Health Purposes N= 504 (10.83%) | Did Not Use Internet for Health Purposes N=4,148 (89.17%) | P-value |
|---|---|---|---|---|
| **Trust Level in Using the Internet** | | | | **0.000** |
| Not confident at all | 319 (6.86%) | 14 (0.30%) | 305 (6.56%) | |
| Slightly confident | 1,258 (27.04%) | 83 (1.78%) | 1,175 (25.26%) | |
| Very confident | 1,555 (33.43%) | 212 (4.56%) | 1,343 (28.87%) | |
| Most confident | 1,520 (32.67%) | 195 (4.19%) | 1,325 (28.48%) | |

**4.2 Analysis of Health Activities Among Internet Users for Health Purposes**

This section examines the specific health activities engaged in by the 504 older adults who used the internet for health purposes, revealing significant variations in their participation in various health-related online activities, as detailed in Table 4 below.

Regarding the use of the Internet for Booking Medical Services, none of the participants (0%) reported using the internet for this purpose, indicating that all 504 individuals (100%) did not engage in online scheduling of medical appointments. This reflects a complete lack of utilization of online platforms for booking medical services among the surveyed users. In terms of Internet Use for Telemedicine, only a minority of the participants, 80 individuals (15.87%), utilized the internet for telemedicine services. Conversely, a majority of 424 individuals (84.13%) did not engage in online consultations with healthcare professionals. This suggests that while telemedicine is gradually being adopted, it is not yet a widespread practice among older adults using the internet for health purposes. Similarly, for Internet Use for Health

Communication, the same proportion of participants, 80 individuals (15.87%), used the internet for this purpose, while 424 individuals (84.13%) did not engage in digital communication with medical experts or for receiving health advice. This indicates a modest level of engagement in direct digital communication with healthcare providers. The Internet Use for Following Health News emerged as the most popular activity, with 394 individuals (78.17%) using the internet for this purpose, and only 110 individuals (21.82%) not doing so. This significant level of engagement highlights that older adults are actively seeking health and wellness information online. Regarding Internet Use for Exercise, a smaller portion of the users, 112 individuals (22.22%), reported utilizing the internet for exercise-related activities. In contrast, a larger group, 392 individuals (77.78%), did not engage in online exercise or health monitoring, indicating that digital tools for physical health management are not widely used among the majority of older adults.

The analysis underscores the varied levels of engagement in different types of digital health services. While following health news online is highly prevalent, other activities such as telemedicine, health communication, and online exercise witness lower participation rates. This variation in usage might be influenced by factors like technological familiarity, perceived relevance, service accessibility, and individual health needs or preferences. Understanding these diverse aspects of digital health engagement is vital for developing targeted strategies to promote the adoption of underutilized services such as telemedicine and online health communication among older adults.

Table 4 Utilization of the internet for various health activities by older adults in Thailand

| No. | Health Activity | Yes (Number of Users) | Yes (Percentage) | No (Number of Users) | No (Percentage) | Total Users |
|---|---|---|---|---|---|---|
| 1 | Booking Medical Services | 0 | 0.00% | 504 | 100.00% | 504 |
| 2 | Telemedicine | 80 | 15.87% | 424 | 84.13% | 504 |
| 3 | Health Communication | 80 | 15.87% | 424 | 84.13% | 504 |
| 4 | Following Health News | 394 | 78.17% | 110 | 21.82% | 504 |
| 5 | Exercise | 112 | 22.22% | 392 | 77.78% | 504 |

**4.3 Analysis of Factors Influencing Health-Related Internet Use Among Older People in Thailand**

Table 5 presents the various factors that associated with older adult's use of the internet for health-related purposes in Thailand. It analyzed data from 4,652 participants to identify the key determinants that significantly affect their inclination to utilize digital health resources. Using logistic regression analysis, the study provides a detailed perspective on how different factors such as sociodemographic attributes, economic status, educational attainment, occupational backgrounds, residential settings, and trust levels in using the internet, influence the older people's engagement with online health activities.

Contrary to common assumptions that gender may play a pivotal role in digital health utilization, the findings reveal an intriguing parity. It shows that male participants, with an odds ratio of 0.088 (SE=0.101, P-value=0.385), indicating no substantial difference from females, the reference group. This suggests a relatively

gender-neutral landscape in digital health engagement among the Thai elderly, challenging stereotypes of gendered internet use.

Age, a factor often thought to influence technological adoption, similarly does not exhibit a stark differential impact across the age groups studied. The distinction between young old, middle old, and very old age categories underscores the evolving relationship with technology as individuals progress through the later stages of life. The analysis indicates no significant difference in health-related internet use when comparing the middle old and very old groups to the young old (60-64 years old) reference group. Specifically, the odds ratio for the middle old (65-74 years old) group (OR=0.195, SE=0.106, P-value=0.067) suggests a marginal, albeit nonsignificant, inclination towards increased internet use for health purposes compared to the young old. Similarly, the very old (75+ years old) group's odds ratio (OR=-0.003, SE=0.200, P-value=0.986) demonstrates an almost neutral effect, indicating that advancing beyond 75 years does not significantly deter or enhance the likelihood of utilizing the internet for health-related activities.

Income emerges as a critical determinant, underscoring the socioeconomic disparities in accessing digital health services. Compared to the reference group earning less than 15,001 baht, individuals in the 15,001 - 30,000 Baht (OR=-0.266, SE=0.135, P-value=0.050) and 30,001 - 45,000 Baht (OR=-0.573, SE=0.267, P-value=0.032) income brackets show a decreased likelihood of using the internet for health. This decrease suggests that even as income increases from the lowest bracket, these income brackets likely have better and more reliable access to both public and private healthcare facilities, which could render online health resources less appealing or necessary. This preference for or reliance on direct medical consultations and treatments can be attributed to a variety of factors, including trust in in-person healthcare, the perceived quality of service, and perhaps the social aspect of healthcare provision. Consequently, while digital health resources offer a convenient alternative for accessing health information and services, they may not be the preferred choice for middle-income individuals who have sufficient resources to opt for traditional healthcare services. This scenario highlights the complex interplay between income, access to healthcare, and the utilization of digital health resources.

Remarkably, those earning more than 90,000 Baht are significantly more inclined to use the internet for health purposes (OR=1.643, SE=0.488, P-value=0.001), underscoring the influence of higher economic status on accessing digital health resources.

The study further delineates the role of education in facilitating health-related internet use. Notably, individuals holding a Bachelor's degree exhibit an increased propensity (OR=0.630, SE=0.250, P-value=0.012) towards digital health engagement, suggesting that higher educational levels equip individuals with the requisite skills and confidence to navigate online health resources effectively.

Occupational background also significantly influences digital health utilization patterns. Business owners (OR=0.932, SE=0.303, P-value=0.002) and freelancers (OR=0.826, SE=0.363, P-value=0.023) exhibit a higher likelihood of utilizing health-related internet services, suggesting that certain professional backgrounds may facilitate or encourage digital health utilization.

Residential setting plays a pivotal role, with urban dwellers displaying a markedly higher propensity (OR=0.696, SE=0.113, P-value<0.001) to engage in online health activities compared to their rural counterparts. This urban-rural divide accentuates the disparities in access to digital infrastructure and health resources, underscoring the need for targeted interventions to bridge this gap.

Lastly, the Trust in using the internet is a strong predictor of health-related internet use, with very confident (OR=1.281, SE=0.300, P-value<0.001) and most confident (OR=1.091, SE=0.300, P-value<0.001) individuals showing notably higher odds of engaging in online health activities, highlighting the importance of digital literacy and self-efficacy in navigating health information online.

Table 5 Factors influencing health-related internet use among older adults in Thailand, results of logistic regression analysis

| Variables | All (N=4,652) | | | |
|---|---|---|---|---|
| | **Odds ratio (Robust SE)** | **95% CI** | **P-value** | **Sig.** |
| **Gender** | | | | |
| Female (ref.) | 1.00 | 1.00 | | |
| Male | 0.088 (0.101) | 0.89-1.33 | 0.385 | |
| **Age** | | | | |
| 60-64 (Young old) (ref.) | 1.00 | 1.00 | | |
| 65-74 (Middle old) | 0.195 (0.106) | 0.99-1.50 | 0.067 | |
| 75+ (Very old) | -0.003 (0.200) | 0.67-1.47 | 0.986 | |
| **Income** | | | | |
| Less than 15,001 Baht (ref.) | 1.00 | 1.00 | | |
| 15,001 - 30,000 Baht | -0.266 (0.135) | 0.59-0.99 | 0.050 | * |
| 30,001 - 45,000 Baht | -0.573 (0.267) | 0.33-0.95 | 0.032 | * |
| 45,001 - 60,000 Baht | 0.021 (0.335) | 0.53-1.97 | 0.949 | |
| 60,001 - 75,000 Baht | 0.168 (0.638) | 0.34-4.13 | 0.793 | |
| 75,001 - 90,000 Baht | 0.553 (0.784) | 0.37-8.09 | 0.481 | |
| More than 90,000 Baht | 1.643 (0.488) | 1.99-13.45 | 0.001 | ** |
| **Education Level** | | | | |
| Below primary | 1.00 | 1.00 | | |

| Variables | All (N=4,652) | | | |
|---|---|---|---|---|
| | Odds ratio (Robust SE) | 95% CI | P-value | Sig. |
| school (ref.) | | | | |
| Lower primary school | -0.240 (0.236) | 0.49-1.25 | 0.309 | |
| Upper primary school | 0.052 (0.227) | 0.67-1.64 | 0.820 | |
| Junior high school | 0.057 (0.241) | 0.66-1.70 | 0.814 | |
| High school/Vocational certificate | 0.421 (0.231) | 0.97-2.40 | 0.068 | |
| Associate degree, Vocational certificate/Diploma | 0.426 (0.274) | 0.90-2.61 | 0.119 | |
| Bachelor's degree | 0.630 (0.250) | 1.15-3.07 | 0.012 | * |
| Master's degree | 0.415 (0.394) | 0.70-3.27 | 0.293 | |
| Ph.D. | 1.050 (0.788) | 0.61-13.40 | 0.183 | |
| **Occupation** | | | | |
| Unemployed (ref.) | 1.00 | 1.00 | | |
| Public officials | 0.492 (0.365) | 0.80-3.35 | 0.178 | |
| Private employees | 0.755 (0.393) | 0.98-4.59 | 0.055 | |
| Business owners | 0.932 (0.303) | 1.40-4.60 | 0.002 | ** |
| Freelancers | 0.826 (0.363) | 1.12-4.65 | 0.023 | * |
| General laborers or drivers | -0.537 (0.413) | 0.26-1.31 | 0.194 | |
| Students | - | - | - | |
| Butlers or housekeepers | 0.620 (0.294) | 1.05-3.31 | 0.035 | * |
| Pensioners or retirees | 0.718 (0.288) | 1.16-3.61 | 0.013 | * |

| Variables | All (N=4,652) | | | |
|---|---|---|---|---|
| | Odds ratio (Robust SE) | 95% CI | P-value | Sig. |
| Farmers | -0.145 (0.289) | 0.49-1.52 | 0.616 | |
| Others | -0.868 (1.110) | 0.05-3.69 | 0.434 | |
| **Residence** | | | | |
| Rural (ref.) | 1.00 | 1.00 | | |
| Urban | 0.696 (0.113) | 1.61-2.50 | 0.000 | *** |
| **Trust Level in Using the Internet** | | | | |
| Not confident at all (ref.) | 1.00 | 1.00 | | |
| Slightly confident | 0.610 (0.316) | 0.99-3.42 | 0.054 | |
| Very confident | 1.281 (0.300) | 1.99-6.49 | 0.000 | *** |
| Most confident | 1.091 (0.300) | 1.65-5.35 | 0.000 | *** |

Note: Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05

# Chapter 5
# Discussion and Conclusion

## 5.1 The Primary Internet Uses for Health-Related Purposes Among Older Adults in Thailand

This study first aims to identify the most common health-related purpose for which the internet is used by older people in Thailand. The findings reveal that engagement of older adults with the internet for health purposes, as observed in this study, underscores a significant yet selective penetration of digital health services among this demographic. The utilization of the internet for health purposes by 10.83% of the participants reflects a growing interest among older adults in Thailand to integrate digital solutions into their health management practices. However, the variation in internet use across different sociodemographic segments, such as income levels and education, suggests disparities in access and adoption. Higher engagement among those with better economic and educational backgrounds highlights the digital divide that may limit the potential benefits of digital health services for all.

With regards to the preferences in health activities, the results reveal a clear preference among older adults for consuming health news online, with a remarkable 78.17% engagement level. This preference indicates a strong desire for health information and suggests that the internet is a vital source for keeping informed about health and wellness topics. Conversely, the negligible use of the internet for booking medical services and the modest adoption of telemedicine and health communication platforms reflect existing barriers or a lack of awareness about these services. The reluctance or inability to use digital platforms for direct health services, such as booking appointments or engaging in telemedicine, points to potential areas for intervention to enhance the usability and accessibility of these services for older adults.

The limited but growing interest in telemedicine and health communication through digital platforms among a subset of older adults signals an emerging trend that could revolutionize how elderly populations interact with healthcare providers. Despite the low overall participation rates, the willingness of 15.87% of the

participants to engage in telemedicine and digital health communication underscores an opportunity to expand these services. Addressing technological barriers, enhancing user-friendliness, and increasing trust in digital health platforms could catalyze a broader acceptance and utilization of these services among the elderly.

The engagement in online exercise and health monitoring activities by 22.22% of internet users for health purposes suggests an openness to incorporating technology into physical health management. This finding indicates a potential growth area for digital health interventions aimed at promoting physical activity and wellness among older adults. Developing age-appropriate, accessible, and engaging digital exercise programs could meet the needs of this demographic, fostering a more holistic approach to health management that integrates physical activity into the digital health landscape.

These findings carry significant policy implications for digital health strategy development, particularly in tailoring interventions to the needs and preferences of older adults. Promoting the adoption of underutilized services like telemedicine requires not only technological enhancements but also educational initiatives to build digital literacy and confidence among older adults. Furthermore, the high interest in accessing health news online presents an opportunity for health educators and providers to disseminate trustworthy and relevant health information through digital channels, potentially serving as a gateway to broader digital health service adoption.

**5.2 Factors Associated with the Health-Related Internet Use Among Older People in Thailand**

The study second aims to examine the relationship between socio-demographic factors and health-related internet use among the older people in Thailand. The results reveal that gender does not significantly influence the use of the internet for health purposes. Age also shows no substantial relation on digital health utilization across different elderly groups. However, income level emerges as a critical factor, with higher income individuals more likely to use the internet for health. Education significantly affects online health engagement, with those attaining higher education levels more inclined to utilize digital health resources. Occupational background influences digital health use, with business owners and freelancers

showing higher engagement. Urban residents are more likely to use the internet for health than their rural counterparts. Trust in using the internet significantly predicts health-related internet use, with higher confidence levels correlating with increased online health activity.

As for the Gender, the parity observed between male and female participants in digital health utilization challenges common stereotypes of gendered internet use. Despite this, literature consistently shows that women, especially elderly women, are significantly more engaged in seeking health information online than their male counterparts (Ybarra & Suman, 2006; Lee et al., 2016; AlGhamdi & Moussa, 2012; Heart & Kalderon, 2013; He et al., 2022; Hung et al., 2020; Choi, 2011; Shahrabani & Mizrachi 2016). In light of this literature, the findings from this study present an interesting contrast. While the global trend indicates a higher engagement among women in seeking health information online, this study did not find significant gender differences in the utilization of the internet for health purposes among older adults in Thailand. This discrepancy may suggest cultural or societal differences that influence the engagement patterns of older Thai adults with digital health resources. Alternatively, it may reflect a broader acceptance and utilization of digital health platforms among older Thai adults, irrespective of gender. While global literature highlights a clear gender disparity favoring women in digital health engagement, the specific context of Thailand suggests a more nuanced understanding is required. This highlights the need for targeted digital health interventions that consider the unique sociocultural dynamics influencing health information-seeking behaviors among older adults in Thailand.

Age, traditionally seen as a barrier to technology adoption, shows a more complex relationship with digital health utilization among Thai elders. The study delineates three age categories: young old, middle old, and very old, and finds that age does not significantly impact the likelihood of using the internet for health purposes across these groups. This finding suggests that age alone may not be the defining factor in digital health engagement and that other socio-demographic and contextual factors may play more significant roles. This is somewhat in contrast to literature that suggests an increased likelihood of online health information-seeking

behavior with age, particularly among those aged 60 and above (Ybarra & Suman, 2006; Lee et al., 2016; AlGhamdi & Moussa, 2012; Heart & Kalderon, 2013; He et al., 2022; Hung et al., 2020; Choi, 2011; Shahrabani & Mizrachi 2016). The uniformity in the findings might reflect a growing digital literacy among the elderly in Thailand, possibly influenced by increased access to technology and targeted digital inclusion efforts. However, the broader trend underscores the importance of age as a factor in digital health engagement, with older adults increasingly turning to the internet for health information and services.

Income and education emerge as significant determinants of health-related internet use, aligning with global observations that higher income and education levels correlate with increased engagement in online health activities (Ybarra & Suman, 2006; Lee et al., 2016; AlGhamdi & Moussa, 2012; Alam et al., 2019; Heart & Kalderon, 2013; He et al., 2022; Hung et al., 2020; Choi, 2011; Shahrabani & Mizrachi 2016). This suggests that socioeconomic status significantly impacts access to and utilization of digital health resources. Higher income and education levels not only provide better access to digital tools but also equip individuals with the necessary skills to effectively navigate and utilize these resources for health purposes. In addition to above our findings about income factors elucidate a complex relationship between income levels and the utilization of digital health services. It indicates that, although individuals with higher incomes are generally more engaged with online health resources, there is a nuanced deviation among middle-income groups, who exhibit a lower propensity towards such use compared to their lower-income and significantly higher-income counterparts. This divergence underscores the multifaceted barriers to digital health adoption, suggesting that access to and preference for in-person healthcare services among these income brackets may influence their engagement with digital health platforms. These findings necessitate targeted healthcare policy reforms that not only aim to bridge the digital divide but also tailor digital health initiatives to accommodate the unique needs and circumstances of each income group. By doing so, policies can foster a more inclusive digital health environment that promotes equitable access to health information and services for all older adults in Thailand, regardless of their income level.

Occupational background and residential setting significantly influence digital health utilization. Business owners and freelancers are more likely to use the internet for health purposes, suggesting that certain occupational experiences may facilitate digital engagement. Moreover, urban residents show a higher propensity towards online health activities than their rural counterparts, underscoring the urban-rural divide in digital access and infrastructure. Addressing these disparities requires targeted efforts to improve digital literacy and infrastructure in rural areas. This finding is consistent with literature indicating that urbanization level and residence in remote areas significantly affect access to and use of digital health services (AlGhamdi & Moussa, 2012; Alam et al., 2019). Addressing these disparities requires targeted interventions to improve digital infrastructure and access in rural areas, ensuring equitable access to digital health services across different geographic locations.

Trust in using the internet are strong predictors of engagement in health-related online activities. This aligns with literature suggesting that trust in online health information and perceptions of the internet's utility significantly influence health information-seeking behavior (Lee et al., 2016; Heart & Kalderon, 2013; He et al., 2022; Shahrabani & Mizrachi 2016). Enhancing digital literacy and building trust in online health resources are crucial for encouraging broader and more effective use of digital health services among the elderly.

**5.3 Theoretical Contributions**

This thesis makes several theoretical contributions to the existing literature on digital health engagement among older adults, particularly within the context of Thailand. By examining the use of the internet for health-related purposes among Thai older adults and analyzing how socio-demographic factors such as age, gender, education level, and income influence this usage, the study enriches the understanding of digital health literacy and access in several ways.

First, this thesis contributes to the evolving narrative by demonstrating a gender-neutral landscape in digital health engagement among Thai older adults. This finding challenges the stereotype of gendered internet use for health purposes and

suggests the need for a nuanced understanding of how both older men and women engage with digital health resources.

Second, this thesis provides a more differentiated view by showing no significant differences across young old, middle old, and very old age categories in their likelihood of using the internet for health-related activities. This contributes to a deeper understanding of the complex relationship between age and digital health engagement, indicating that factors beyond chronological age may play critical roles in influencing online health information-seeking behavior.

Third, this thesis contributes to the discourse on the digital divide by highlighting the significant impact of income and education on digital health utilization. It underscores the socioeconomic barriers that limit access to digital health resources among lower-income and less-educated older adults in Thailand. These findings reinforce the need for targeted policies and interventions to mitigate these disparities and ensure equitable access to digital health information and services.

Fourth, this thesis adds to the literature by elucidating how these factors influence older adults' engagement with digital health services. It reveals that certain professional backgrounds and urban residency are associated with higher likelihoods of utilizing digital health resources, contributing to a more comprehensive understanding of the factors that facilitate or hinder digital health utilization.

Last, this thesis further contributes to theoretical discussions on digital literacy and trust in technology as critical determinants of digital health engagement. It demonstrates that higher levels of confidence in using the internet are strongly associated with increased engagement in online health activities, highlighting the importance of digital literacy and trust in technology for promoting digital health utilization among older adults.

**5.4 Policy Implications**

The findings of this thesis on the use of the internet for health-related purposes among Thai older adults, and the influence of socio-demographic factors on this usage, offer several critical policy implications to improve digital health engagement and access among the elderly population in Thailand.

First, the government should enhance digital literacy programs. Given the significant role of digital literacy and confidence in using the internet, there is a need for targeted digital literacy programs for older adults. These programs should aim to improve their skills and confidence in navigating online health resources, potentially increasing their engagement with digital health services. Collaborations between government agencies, NGOs, and community centers could facilitate the rollout of such programs, especially in rural areas where digital literacy may be lower.

Second, the government should address the digital divide through accessible and affordable internet. The socioeconomic disparities highlighted by the thesis, particularly the impact of income on digital health utilization, underscore the importance of making internet access more affordable and accessible for older adults. Policies aimed at subsidizing internet costs or providing free Wi-Fi in public spaces could help mitigate these disparities. Additionally, ensuring that older adults have access to affordable digital devices is crucial.

Third, the government should incorporate the geriatric needs into digital health design. The varied engagement in health-related online activities suggests the need for digital health services that are designed with the specific needs and preferences of older adults in mind. This includes user-friendly interfaces, simplified navigation, and content that is relevant to the health concerns of the elderly population. Policy efforts could encourage the development and adoption of such tailored digital health solutions.

Fourth, the government should promote the telemedicine and online health services. Despite the relatively low utilization of telemedicine and online health communication among older adults, these services have the potential to greatly benefit this population group. Policies that promote the adoption of telemedicine by healthcare providers, and that educate older adults on the benefits and usage of such services, could increase their uptake. This is particularly relevant in bridging the urban-rural divide, as telemedicine can provide access to healthcare services for those in remote areas.

Fifth, the government should consider the issues of urban-rural digital health equity. The significant difference in digital health utilization between urban and rural residents highlights the need for policies that specifically address the digital divide between these areas. This could involve investing in digital infrastructure in rural areas, such as improving internet connectivity and accessibility, as well as targeted health information campaigns that reach out to rural communities.

Sixth, the government should integrate digital health into public health policy. The findings suggest that integrating digital health strategies into broader public health policy could enhance the health and well-being of older adults. Policies could focus on integrating digital health education into routine healthcare services, encouraging healthcare providers to recommend reputable online health resources, and developing national guidelines for digital health services tailored to the needs of older adults.

**5.5 Research Limitations**

The thesis presents insightful findings on the use of the internet for health-related purposes among older adults in Thailand; however, it is not without its limitations. One of the primary limitations is its cross-sectional design, which captures data at a single point in time, thus limiting the ability to infer causality between socio-demographic factors and internet use for health purposes. Longitudinal studies could provide a more nuanced understanding of how digital health engagement evolves over time among older adults. Another limitation is the reliance on self-reported data, which may introduce bias. Respondents might overestimate their internet usage or misreport their engagement with online health activities, affecting the accuracy of the findings. Future research could benefit from incorporating objective measures of internet use, such as digital usage logs or direct observation. The study's focus on older adults in Thailand may also limit the generalizability of the findings to other populations. Cultural, economic, and infrastructural factors unique to Thailand could influence digital health behaviors differently compared to other countries. Comparative studies across different cultural and economic contexts could enrich the understanding of digital health engagement among the elderly. Lastly, the analysis did not delve deeply into the qualitative aspects

of internet use for health purposes, such as the specific types of health information sought or the perceived quality of online health resources. Qualitative research could provide richer insights into the motivations, barriers, and experiences of older adults using the internet for health-related purposes.

**5.6 Future Research**

The findings from this thesis on the use of the internet for health-related purposes among older adults in Thailand open several avenues for future research. Firstly, longitudinal studies are needed to explore the dynamic nature of internet use among the elderly, tracking changes in digital health engagement over time and identifying causal relationships between socio-demographic factors and health-related internet use. Secondly, expanding the research to include a more diverse array of socio-demographic backgrounds and geographic locations within Thailand could provide a more comprehensive understanding of the digital divide. Investigating rural versus urban disparities in greater detail, as well as the impact of regional infrastructural differences on internet use for health purposes, would be valuable.

Future studies could also explore the qualitative aspects of older adults' internet use for health purposes. In-depth interviews or focus groups could uncover the motivations behind seeking health information online, the types of information sought, and the perceived reliability and quality of online health resources. This qualitative insight would complement the quantitative data, offering a more nuanced understanding of older adults' online behaviors and preferences. Additionally, research into the effectiveness of interventions designed to increase digital literacy and internet use for health purposes among older adults is crucial. Evaluating the impact of educational programs and targeted digital inclusion strategies could inform policies and programs aimed at enhancing the digital health engagement of the elderly population.

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# BIOGRAPHY

| | |
|---|---|
| **NAME** | Mr. Kittisak Robru |
| **DATE OF BIRTH** | 8 October 1999 |
| **PLACE OF BIRTH** | Mueang District, Mukdahan Province |
| **ADDRESS** | 130 Moo 11, Ban Khamcha-I, Khamcha-I Subdistrict, Khamcha-I District, Mukdahan Province |
| **EDUCATION** | 2024 Master of Political Science (Public Administration and Public Policy), College of Politics and Governance, Mahasarakham University<br>2021 Bachelor of Political Science, College of Politics and Governance, Mahasarakham University |