Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

DHEC Tourism and Senior Friendly Services as Drivers of Healthy Ageing and Economic Benefits

Samuel Adeyinka-Ojo

samuel.adey@curtin.edu.my

Curtin University, Malaysia

Mahadi Hasan Miraz

Atlas University, Turkey

Tek Yew Lew

Curtin University, Malaysia

Mohammad Tariq Hasan

United International University, Bangladesh

James Bakul Sarkar

American International University-Bangladesh

Mohammad Faridul Alam

United International University, Bangladesh

Rohana Bt Sham

Asia Pacific University of Technology and Innovation, Malaysia

Narishah Mohamed Salleh

Sunway University, Malaysia

Research Article

Keywords: Health tourism, eco-tourism, cultural tourism, senior-friendly services, quality of life, economic benefit

Posted Date: July 1st, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9962502/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

This study investigates the impact of multiple tourism, namely digital tourism, health tourism, eco-tourism, cultural tourism (DHEC tourism), and senior-friendly services on healthy ageing, which leads to quality of life and economic benefits. This work explores the proposed correlations on a sample of 323 respondents using Partial Least Squares- Structural Equation Modelling (PLS-SEM). The results show that all variables except digital tourism substantially impact healthy ageing, significantly improving the quality of life and green economic benefits. Being closely related to promoting physical, mental, and social well-being, health tourism, in particular, supports the idea that therapeutic and health tourism activities promote healthy ageing. The benefits of outdoor activities are highlighted by ecotourism, which also improves mental and physical health significantly. Cultural tourism is related to social interaction, emotional contentment, and cognitive stimulation—all of which will enhance quality of life and increase happiness. By promoting social involvement and independence, age-friendly services—which stand out for accessibility and a tailored experience—significantly improve the quality of life for older adults. The findings show that these tourism activities result in significant economic benefits, such as increased expenditure, job creation, and environmentally friendly economic practices. These findings emphasise the need for developing and growing tourism industries that meet the needs of an ageing population, which will stimulate economic growth and encourage healthy ageing and improved quality of life. This study's primary focus is on the need for inclusive and accessible tourism experiences that provide enlightened information to policymakers and industry stakeholders. Notably, the findings provide evidence for achieving SDG 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth), and SDG 11 (Sustainable Cities and Communities) through inclusive and age-friendly tourism development.

1. Context and Background

With the world's population ageing at a rate never seen before 2050, the proportion of people 60 and older is expected to reach about two billion. This demographic upheaval for nations everywhere presents potential major issues (Vigolo, 2017). People live longer due to increased life expectancy, declining fertility rate, and the ‘baby boom’ (Vigolo, 2017). Therefore, focusing on this is becoming increasingly important. An important goal of ageing properly includes social, mental, and physical well-being (F. Hu et al., 2023; Qiao et al., 2022; Zhang et al., 2021). In this situation, several tourist categories—health, eco, cultural, and age-friendly services—are growing in popularity as potential ways to promote healthy ageing and improve elderly adults' quality of life. In the context of DHEC, digital tourism enhances accessibility, health tourism promotes physical and mental well-being, eco-tourism encourages environmental stewardship, and cultural tourism strengthens social inclusion and heritage preservation. Together with senior-friendly services, these tourism dimensions may contribute directly to several Sustainable Development Goals, particularly SDGs 3, 8, and 11

1.1 Introduction

The recent COVID-19 pandemic presents an additional hurdle for a particular group of older individuals, as they have a heightened risk of experiencing negative consequences in the event of infection (Iaccarino et al., 2020; Marois et al., 2020). According to the World Health Organisation (WHO) Decade for Healthy Ageing, if an extended lifespan is characterised by ill health, social isolation, or reliance on assistance, it harms older individuals and society regarding sustainability and progress (WHO, 2020). The diminished health of elderly individuals results in decreased productivity, lower earnings, earlier retirement, and a heightened need for health care and social services (WHO, 2020).

The ageing process varies among individuals, as the decline in abilities usually associated with ageing diverges and is shaped during a person's life (WHO, 2017). Disability and dependency do not necessarily occur due to ageing, and several actions can be taken to convert it into an opportunity, such as by providing assistance and encouraging active and healthy ageing throughout one's life (V. De Luca et al., 2021). The World Health Organisation (WHO) outlined three fundamental strategies for adapting health systems to cater to the requirements of older populations: (i) creating and guaranteeing the availability of services that priorities the needs and preferences of individuals and are well-coordinated, (ii) structuring systems based on the inherent abilities and potential of individuals, and (iii) ensuring the presence of a capable and well-trained healthcare workforce that can be maintained in the long term (WHO, 2017). From this standpoint, it is imperative to enhance the promotion of health and prevention of diseases over the entire lifespan. This should be done while catering to the requirements of an ageing population by facilitating the ability to live independently at home, managing age-related ailments independently, and minimising social isolation. In this circumstance, tourism activities can promote healthy ageing (da Costa Guerra et al., 2022; Y. Fan et al., 2024; Wong & Bastrygina, 2024).

Even if the potential benefits of tourism for healthy ageing are becoming more widely acknowledged, there is a shortage of comprehensive research on how different tourism activities improve the health and well-being of elderly individuals (F. Hu et al., 2023; Qiao et al., 2022). While age-friendly services, ecotourism, health tourism, and cultural tourism offer unique benefits, little is currently understood about how they affect healthy ageing and general quality of life. Furthermore, the financial implications of boosting these tourism industries as a healthy ageing strategy have received little attention. Together with health retreats and spa visits, medical tourism can provide elderly folks with access to specialised medical care, rehabilitation therapies, and all-inclusive wellness (da Costa Guerra et al., 2022; F. Hu et al., 2023; Patterson & Balderas-Cejudo, 2022).

It is unknown how much money age-friendly services, ecotourism, cultural travel, and health tourism will cost to include in bigger travel plans. Idiosyncratically, the internet enables individuals to access information, select a location, and generate and share content that might impact the perception of the destination, and this gives rise to a sustainable and responsible digital tourism ecosystem (Almeida-Santana et al., 2020; Preko et al., 2023). Digitalisation is the conversion of analogue processes and data into representations that machines can read (OECD, 2020). Currently, digitalisation is dominant in all aspects of the travel industry, including completely automated corporate operations, online travel sales, service delivery, information searching, online bookings and requests for proposals, and post-trip

consumer behaviour (Akhtar et al., 2021; Kalia et al., 2022; Regalado et al., 2024). It is driving the rapid growth of the sharing economy, surpassing limitations, enabling highly personalised experiences, transforming destination marketing methods, and forging new connections (BBC, 2020).Therefore, this study creates the **Objectives of the Study**:

The primary objective of this study is to investigate whether health tourism, digital tourism, eco-tourism, cultural tourism, and senior-friendly services enhance healthy ageing and improve the quality of life for older adults. Specifically, the study aims to assess the physical, mental, and social health outcomes associated with participation in these forms of tourism. Evaluate the overall impact on older adults' quality of life and satisfaction. Examine the economic benefits of promoting these tourism sectors as part of a strategy for healthy ageing, including potential contributions to local and national economies.

Investigating the inline factors that affect customer satisfaction rating and exploring the interplay between health tourism, digital tourism, eco-tourism, cultural tourism, senior-friendly services, and healthy ageing is crucial for understanding how these elements can collectively enhance the quality of life for older adults and generate economic benefits. This comprehensive research provides valuable insights that can guide the development of integrated strategies for promoting healthy ageing through tourism, ultimately benefiting individuals, communities, and economies.

2. Literature Review

The global ageing population significantly challenges healthcare systems, social services, and economies (Vigolo, 2017). Healthy ageing—preserving one's physical, mental, and social health in later life—is becoming increasingly important as people live longer (F. Hu et al., 2023; Qiao et al., 2022). It is becoming more well-known that tourism—particularly health, eco, cultural, and age-friendly services—can help older persons stay healthy and live better (F. Hu et al., 2023). The current state of knowledge on the tourism sectors and their effects on quality of life, healthy ageing, and economic gains is substantially reviewed in the literature (Akhtar et al., 2021; Y. Fan et al., 2024; F. Hu et al., 2023). Medical treatment and advanced procedures are not available to citizens in several countries. Research has shown that longer waiting times and a lack of specialized surgeons and medical types of equipment lead to looking for health tourism. Besides, older citizens intend to participate in fitness programmes, yoga, meditation, and nature-based exploration. These activities aid them in lowering stress, increasing physical fitness, and enhancing general health (Kim et al., 2015; Lukoseviciute et al., 2024; Szromek, 2021). Older people with chronic illnesses benefit especially from hydrotherapy and massage, which encourage pain alleviation and relaxation (Koskinen & Wilska, 2019). Joining wellness programmes can help to lessen anxiety and depression symptoms greatly (Patterson & Balderas-Cejudo, 2022). Sustainable tourism seeks to balance economic prosperity, social well-being, and environmental protection while meeting the needs of present and future generations. Tourism is increasingly recognized as an important mechanism for achieving the SDGs.

Health tourism boosts the economy by raising expenditure on lodging, medical services, and associated activities (Lindner et al., 2021). Health tourism has allowed notable economic growth in Thailand, India, and Mexico (Hanefeld et al., 2015). Travel experiences centred on nature that support sustainability and environmental preservation are called ecotourism. This covers things like bird watching, hiking, and seeing protected natural places. Physical exercise is vital for older persons to preserve their mobility and physical health; ecotourism activities encourage it. Frequent exercise increases cardiovascular health and decreases the chances of chronic illness (Pretty et al., 2005). A natural setting is linked to less stress, better mood, and better cognitive function (Pretty et al., 2005). Studies indicate that being outdoors can improve general health and lessen the symptoms of mental health issues (Bratman et al., 2019). Participation in group activities enhances the feeling of belonging and social connectedness (Wickramaratne et al., 2022), which helps improve their health and quality of life. Ecotourism produces economic gains because it supports the regional economy and creates jobs. Additionally, it helps with environmental protection and sustainable development, which can benefit communities over time (Balderas-Cejudo & Patterson, 2024).

Through learning and participating in novel experiences, cultural tourism activities stimulate the brain, while cognitive engagement preserves and enhances mental function in elderly persons (Li et al., 2023). Engaging in cultural activities and interacting with cultural legacy might help one feel better emotionally and build stronger social ties (Dashper et al., 2021). Opportunities for significant encounters that strengthen a feeling of identity and purpose are presented by cultural tourism (Dashper et al., 2021; Li et al., 2023). By drawing visitors and advancing cultural enterprises, cultural tourism boosts the economy. This promotes employment development and increases spending in allied sectors such as retail, entertainment, and hospitality (Balderas-Cejudo et al., 2021). Age-friendly services are lodging and tourist facilities intended to satisfy the demands of senior citizens (D. X. F. Fan et al., 2023). Among these are reasonably priced travel, lodging suitable for senior citizens, and customised vacation packages.

Offering services geared at senior citizens guarantees them safe and comfortable travel. It promotes regular travel and tourism-related activities, which can benefit social, mental, and physical health (D. X. F. Fan et al., 2023), and assuring accessibility of tourism services enables older persons with disabilities or mobility issues to enjoy their vacation fully. Travelling is easier and more independent (D'Arcy and Dixon, 2009). Seniors make a lucrative market niche since they frequently have the leisure and the money to travel (Balderas-Cejudo et al., 2021; D. X. F. Fan et al., 2023). More affluent travellers can be drawn in, and spending in the tourism sector can rise with individualised services (Lukoseviciute et al., 2024; Mrčela et al., 2015; Szromek, 2021). Age-friendly services, ecotourism, health tourism, digital tourism, and cultural tourism, taken together, generally raise older people's quality of life. Tourism activities encourage social interaction, mental health, and physical fitness—all critical to healthy ageing.

2.1 Underpinning Theories

Determining if health tourism, digital tourism, ecotourism, cultural tourism, and age-friendly services promote healthy ageing and improve quality of life and financial benefits will require delving into the theoretical foundations of these connections. It looks at concepts in, among other disciplines, gerontology, tourism studies, and psychology. The activity theory is a psychosocial theory of ageing that aims to explain the individual and social circumstances that facilitate the highest level of happiness and contentment as individuals navigate the various difficulties associated with ageing (Havighurst, 1961). According to this approach, positive ageing refers to the preservation, to the greatest extent feasible, of the activities and attitudes associated with middle age (Havighurst, 1961). Research suggests that older adults are more likely to experience successful ageing when they engage in activities that promote social interactions and take on productive societal roles, such as volunteering or participating in social groups or activities (Teles & Ribeiro, 2019). This includes replacing any roles that may have been lost due to ageing. This point of view holds that regular participation in positive activities can help maintain mental and physical health, promoting healthy ageing (Mrčela et al., 2015). Seniors participating in wellness programmes, treatments, and spa activities encourage better health outcomes. Hiking and bird watching are outdoor activities that improve mental and physical wellness. A trip to museums, cultural activities, and historical sites enhances cognitive function and provides emotional fulfilment. Participating in tourist activities keeps senior folks engaged and pleasant when they have reasonably priced housing and transportation.

The ecology theory of ageing was developed by Lawton and Nahemow (1973) emphasises the connection between an individual's competency (physical, cognitive, and social capacities) and environmental difficulties. This theory states that maximum well-being is attained when these elements are balanced. Older people can satisfy their physical and cognitive needs in health and medical care facilities, improving their well-being (Teles & Ribeiro, 2019). An easily reachable natural setting with appropriate challenges can improve mental and physical well-being. Social cognitive theory (SCT) (Bandura, 1999) offers a robust theoretical framework for studying the impact of behaviour and environmental circumstances on the formation of ideas in humans. According to the notion, an individual's actions and motivations are contingent upon the conditions they find themselves in (Preko et al., 2023). SCT enables researchers to establish and reinforce social and personal standards for contextualising pertinent concepts, such as digital tourism (Preko et al., 2023). Life pleasure can be enhanced in a culturally diverse setting that challenges the mind without overwhelming the individual. Environments supporting senior citizens' independence and well-being (e.g., easily accessible facilities and tailored services) reduce environmental stress.

2.2 Hypothesis Development

Aligned with the issues of the current sustainable ageing tourism literature review and theories, this study constructs the hypothesis below.

The global health and wellness tourism trend mirrors a growing understanding of the need to maintain health and well-being through travel and leisure activities (da Costa Guerra et al., 2022; Patterson & Balderas-Cejudo, 2022; Wong & Bastrygina, 2024). According to the Global Wellness Institute, wellness

tourism is one of the travel industry's fastest-growing segments and represents a sharp shift in consumer preferences for wellness-focused activities. This tendency fits with the greater focus of society on sustainable lifestyles and preventative health measures (Koskinen & Wilska, 2019). A good ageing process depends on the many physical, mental, and social health benefits of health tourism (Vigolo, 2017). Health tourism activities, including spa treatments, fitness programmes, nutritional advice, and medical examinations, encourage physical health, lower stress, and enhance mental wellness (Patterson & Balderas-Cejudo, 2022; Szromek, 2021; Zhang et al., 2021). The overall goal of healthy ageing is to maintain functional capacity and high quality of life into old age, and these benefits help to achieve that.

The emphasis on sustainability in contemporary travel culture is often matched by sustainable health tourism practices (da Costa Guerra et al., 2022). Local and organic food, environmentally friendly housing, and environmental conservation projects are highlights of many health tourism destinations. Together with attracting eco-aware tourists, these sustainable activities improve the quality of life in the surrounding communities and reduce the environmental effect, furthering the more general goals of sustainable tourism. Including health tourism into the cultural framework of modern sustainable tourism reflects a whole travel philosophy that prioritizes both environmental sustainability and individual well-being (da Costa Guerra et al., 2022). Travellers are looking for more experiences supporting their ecological responsibility while helping them reach their health goals. More of this growing market of eco- and health-conscious tourists can be drawn to sustainable tourism destinations.

Empirical research supports a connection between health tourism and healthy ageing (F. Hu et al., 2023; Koskinen & Wilska, 2019; Zhang et al., 2021). Study shows that participating in health tourism activities significantly improves the physical and mental health required for ageing (Mrčela et al., 2015; Vigolo, 2017). The reality that places that give sustainable practices a top priority in their health tourism offers report higher levels of visitor satisfaction and repeat business is further evidence of the importance of sustainability in today's tourist culture. More and more, industry and government stakeholders understand how important health tourism is in promoting sustainable travel and healthy ageing. Many regions are committed to incorporating health tourism within the larger sustainable tourism framework by implementing policies and initiatives that promote the expansion of health tourism infrastructure and services. This evidence also supports the notion that a vital link between health tourism and healthy ageing is included in the cultural components of contemporary sustainable tourism. Finally, within the artistic parameters of modern sustainable tourism, the growing demand for health-focused travel experiences, the health benefits associated with these activities, the integration of sustainable practices, empirical data, and supporting policies and initiatives justify the significant relationship between health tourism and healthy ageing. This connection emphasizes health tourism's potential to promote sustainable tourist growth and individual well-being.

Hypothesis 1

Health tourism has a significantly positive relationship with healthy ageing

Digital tourism is a superior and more secure alternative for the tourism sector (Akhtar et al., 2021). While digital tourism cannot fully substitute the authentic experience, it can be a valuable tool to make tourism more accessible to a wider audience, particularly during challenging circumstances like pandemics or for individuals with physical limitations (Regalado et al., 2024). Digital tourism refers to utilising digital technologies to integrate digital material into the physical world, aiming to enhance the overall visitor experience (Adeola & Evans, 2019; Benyon et al., 2014). Some scholars have referred to it as a digital tourism business which involves utilising the internet as a platform for sales and marketing purposes (Preko et al., 2023; Saura et al., 2020). Consumers are experiencing a significant cultural influence known as "digital amnesia," where they are fully engaged in their digital devices and living digital lives (Kalia et al., 2022). They require uninterrupted access to make trip arrangements, recall reservations, or share photos with friends and relatives (Kalia et al., 2022). However, this study emphasises digital tourism as video, images, virtual travel through channels, the internet, and games. Recent technological advancements have facilitated users in enhancing their capacity to discover destinations with more ease and reliability (Akhtar et al., 2021). Regalado et al. (2024) showed that the institutionalised group did not experience motion sickness, and sophisticated gaming techniques had emerged for navigating the virtual environment. This study highlights the potential of digital tourism as a feasible and advantageous alternative, providing insights into its many effects on user experiences, health, and social dynamics.

Hypothesis 2

Digital tourism has a significantly positive relationship with healthy ageing

Ecotourism has grown in favour as travellers become more ecologically aware and seek opportunities to engage with nature, causing less environmental impact (Belova & Fedina-Zhurbina, 2023; Kim et al., 2015). As the International Ecotourism Association points out, ecotourism is growing in significance within modern tourist culture above the tourism industry. This tendency aligns with the growing focus on sustainability and healthy living. Ecotourism offers several physical and mental health benefits required for healthy ageing. Hiking, bird viewing, and nature excursions are examples of physical exercise that are important for senior citizens to maintain mobility and physical health. To improve mental health, reduce stress, and improve mood—all of which are essential for healthy ageing—is time spent in natural environments. Ecotourism is, by definition, sustainable, emphasising environmental preservation since it helps the local population and reduces environmental impact (Lukoseviciute et al., 2024). This approach complies with the modern sustainable tourism cultural norms, which prioritise social and environmental responsibility. Ecotourism destinations usually focus on conserving natural areas and artistic legacy, which helps to guarantee the tourism industry stays viable. Intimacy with the natural world is a key component of ecotourism and is associated with improved health. Outdoor activities can improve cognitive function, reduce the chance of chronic disease, and improve senior citizens' general quality of life (Lukoseviciute et al., 2024). This relationship supports the concept of biophilia, according to which people are drawn to nature by nature and that contact with it improves wellbeing.

Positive links between ecotourism and healthy ageing are supported by empirical research (Kim et al., 2015; Lukoseviciute et al., 2024). Research shows that ecotourism activities greatly improve senior citizens' socialisation and mental and physical health. Stressing the need for sustainability in today's tourism industry, ecotourism sites that adhere to sustainable principles also provide higher levels of visitor satisfaction and advantages to the locals. More and more, industry and government stakeholders are understanding how crucial ecotourism is to promoting sustainable travel and healthy ageing. A commitment to include ecotourism in the wider framework of sustainable tourism is shown by the worldwide application of policies and initiatives encouraging the expansion of ecotourism infrastructure and services. These rules also provide evidence in the cultural aspects of contemporary sustainable tourism that ecotourism and healthy ageing are intimately intertwined. Ecotourism promotes community involvement and cultural interchange, which improves social as well as physical and mental health (Chee, 2024). This comprehensive approach to well-being is essential to a healthy age since it considers many facets of health and quality of life. With ecotourism, older people can engage in important activities, learn about conservation initiatives, and connect with locals who encourage a sense of purpose and fulfilment. Ultimately, the growing appeal of ecotourism, the benefits of nature-based activities for health, the integration of sustainable practices, and the empirical evidence all point to a solid correlation between ecotourism and healthy ageing within the cultural confines of contemporary sustainable tourism.

Hypothesis 3

Eco-tourism has a significantly positive relationship with healthy ageing

Cultural tourism has become a major sector of the travel and tourist industry as more people seek to explore various cultures, traditions, and historical places (Dashper et al., 2021). According to the World Tourism Organisation (UNWTO), cultural tourism plays a significant role in global tourism, indicating its importance in contemporary tourism culture. This inclination fits in with the society's overall focus on tolerance and diversity of cultures. Cultural tourism has several health benefits that encourage healthy ageing (Li et al., 2023). Participating in cultural events, museums, and historical site tours encourages social contact, emotional fulfilment, and cognitive stimulation (Patterson & Balderas-Cejudo, 2022). These activities are essential for sustaining cognitive function, reducing stress, and improving general health in senior citizens (Dashper et al., 2021). Environment-friendly techniques are often included in cultural tourism to assist in maintaining local traditions and cultural heritage. Maintaining the cultural principles of contemporary sustainable tourism focuses on moral tourism methods, community participation, and heritage preservation. (Balderas-Cejudo & Patterson, 2024). Cultural tourism partly maintains tourist destinations, promoting intercultural understanding and preservation. Participating in cultural tourism supports social interaction and community (Patterson & Balderas-Cejudo, 2022), two essential components of healthy ageing. Older individuals benefit from chances to interact, share experiences, and learn about diverse cultural perspectives (Wickramaratne et al., 2022).

Studies show that older adults who participate in cultural events function better cognitively, emotionally, and generally. As places focusing on cultural tourism attest, it is crucial for sustained visitor growth (Balderas-Cejudo & Patterson, 2024; Dashper et al., 2021; Li et al., 2023). The need for cultural tourism to promote environmentally friendly travel and healthy ageing is well recognised by governments and other stakeholders in the tourist sector. Laws and initiatives to safeguard cultural legacy, foster intercultural dialogue, and improve the visitor experience are becoming more sound worldwide. These projects show commitment to integrating cultural tourism into the broader framework of sustainable tourism and support the idea of its strong association with healthy ageing. Through opportunities for lifelong learning, personal growth, and emotional enrichment, cultural tourism improves the quality of life for senior citizens (Balderas-Cejudo & Patterson, 2024; Dashper et al., 2021; D. X. F. Fan et al., 2023). Participating in cultural events encourages respect for diverse cultures, curiosity, and discovery, increasing general well-being and self-actualisation (D. X. F. Fan et al., 2023). This connection emphasises how cultural tourism may improve people's well-being and the sustainable development of tourist destinations.

Hypothesis 4

Cultural tourism has a positive and significant relationship with healthy ageing

The ageing of the global population has increased the demand for age-friendly travel services. Seniors are one growing segment of travellers seeking affordable, supportive travel experiences that meet their unique needs (Chee, 2023; Kim et al., 2019). What is causing this trend is a desire to maintain vacation and leisure activities while maintaining health and well-being. Many hotels, facilities, and activities are designed for older tourists (Suess & Mody, 2017). These facilities for senior travellers can include accessible transportation, mobility aids, age-appropriate activities, and personal assistance (Chaulagain et al., 2021). Access to age-friendly services promotes good ageing, enabling senior citizens to participate in leisure and travel activities that enhance their social, mental, and physical health (Chee, 2024; Kim et al., 2019). Reasonably cost travel options reduce the stress of planning a trip and promote social interaction, essential to maintaining health and quality of life as one age, including eco-friendly methods. Age-friendly services enable senior citizens to engage with local communities and participate in meaningful travel experiences, advancing social inclusion (Chaulagain et al., 2021; Chee, 2024). These relationships support the understanding and exchange of cultures and economic growth in tourism destinations. Socially conscious tourism techniques enhance the trip experience and give senior adults a sense of belonging and comfort (Chee, 2023). Age-appropriate travel services have been shown in research to improve general well-being, foster greater social contact, and produce better physical health outcomes in older people (Chaulagain et al., 2021; Chee, 2023, 2024; Suess & Mody, 2017). As demonstrated by the higher levels of visitor satisfaction and loyalty reported by places that prioritise age-friendly activities, satisfying the needs of older visitors also has economic and social benefits (Hung & Lu, 2016). Given how age-friendly tourism may promote healthy ageing and quality of life, this link is a valid notion that merits further investigation.

Hypothesis 5

Senior-friendly services have a positive significant effect on healthy ageing.

Healthy ageing has gained more attention lately since people live longer everywhere. Healthy ageing is preserving physical, mental, and social well-being in the later years of life (Qiao et al., 2022; Zhang et al., 2021). As with the Sustainable Development Goals, this concept improves the well-being of the current and next generations. Social contacts, overall happiness, and mental and physical health are all components of quality of life. It takes maintaining a high quality of life for senior citizens to be content and happy later. Positive travel experiences can improve general health and promote it into old life. Tourism significantly enhances the quality of life by offering entertainment, relaxation, cultural enrichment, and social interaction opportunities. By travelling, older people can gain useful experiences that improve their social networks, emotional well-being, and personal growth. It is especially important to ensure that everyone, regardless of age or ability, benefits from the good impacts of tourism on quality of life through inclusive and accessible tourism practices. Sustainable tourism practices are an essential part of the contemporary tourist industry and emphasise responsible travel conduct that minimises negative environmental, social, and cultural repercussions while maximising benefits for local communities. Tourism promotes sustainability, which enhances the total tourist experience, fosters community development, and helps to protect natural and cultural resources. Because sustainable tourism prioritises the well-being of tourists and host communities, it is consistent with the concepts of healthy ageing.

Research shows that engaging in tourism can improve the quality of life for senior citizens (Kim et al., 2015; Zhang et al., 2021). Research shows that older travellers' mental health, cognitive function, emotional resilience, and social integration all increase. Travel destinations that provide easily accessible amenities, cultural events, and leisure activities meet the wide range of older people's needs and preferences, improving their general quality of life. More and more governments, tourism associations, and business participants are seeing the need to promote tourist activities that support healthy ageing and improve quality of life. Global development of sustainable tourism, accessibility, and age-friendly travel standards are underway. These programmes demonstrate the commitment to include tourism in more comprehensive strategies to promote well-being and sustainable development. The theory that healthy ageing and enhancing the quality of life have a significant relationship in the cultural criterion of modern sustainable tourism is finally supported by empirical data, promotion of sustainable tourism practices, and demographic trends. Return to policies and programmes. This website demonstrates how tourism can promote the general happiness and well-being of older people by providing them with rewarding experiences.

Hypothesis 6

Healthy ageing and enhanced quality of life are significantly correlated

Senior travel becomes more important as the world's population ages (Kim et al., 2019; Vigolo, 2017). Because of their more free time and disposable income, the tourist industry considers seniors a lucrative market (Vigolo, 2017). Spending on food, hotels, transportation, and leisure activities is how travel and tourism contribute to economic growth. Healthy ageing contributes to realising economic benefits since it extends people's useful life. Seniors in good health are likelier to continue being active in their businesses, volunteer activities, or occupations. This population also boosts the economy by spending on consumer goods, leisure pursuits, and medical (Balderas-Cejudo et al., 2021; D. X. F. Fan et al., 2023; Vigolo, 2017). Seniors who travel widely make major contributions to the tourism sector. They usually possess the means and the desire to travel, participate in cultural events, and pursue leisure activities. Longer stays and more spending by tourists will benefit financial tourism destinations catering to senior adults' needs and preferences (Balderas-Cejudo et al., 2021; D. X. F. Fan et al., 2023). Age-appropriate activities, fairly priced lodging, and transit options attract and encourage longer stays in older visitors (Chaulagain et al., 2021). These services enhance travel and support the local economy by generating revenue for businesses and jobs in the hotel and service sectors. From the perspective of an ageing population, they spend on tourism, which costs them financially. But, employing healthy ageing helps them economically since they spend less on health issues. Therefore, this study argues that tourism enables a healthy retirement life that leads to economic benefits among the ageing population.

Hypothesis 7

There is a significant relationship between healthy ageing and the economic benefits of an ageing population

2.3 Conceptual Framework

Therefore, this study constructs the conceptual framework of this study in Fig. 1. Figure one states the independent variables (Health tourism, digital tourism, eco-tourism, cultural tourism, senior-friendly services), the mediation (healthy ageing), and the dependable variables (enhanced quality of life, economic benefits).

3. Methodology

This study adopts a quantitative research design to investigate whether health tourism, digital tourism, eco-tourism, cultural tourism, and senior-friendly services enhance healthy ageing, improve quality of life, and aid economic benefits. Partial Least Squares-Structural Equation Modeling (PLS-SEM) was used to analyse the data and test the proposed relationships.

3.1 Sample and Sampling Technique

A total of 323 respondents were included in this study. We polled medical tourism professionals, patients, and stakeholders. Participants possessed appropriate research expertise and experience according to inclusion criteria. Background demographic and professional data contextualized and

verified qualitative results. This sample size is considered adequate for SEM-PLS analysis, which requires a minimum of 100–200 samples to achieve reliable results. Finally, random sampling is used to select participants from the identified population to ensure representativeness and minimize sampling bias.

3.2 Data Collection, analysis and Measurement Scales

Respondents from Asia and Europe were interviewed because of its strategic position and rising medical tourism relevance. The research evaluated local medical tourism behaviours, perspectives, and obstacles in this national context while maintaining cultural and institutional data consistency. A structured questionnaire was developed to collect data, which is shown in the online appendix—items adapted from tourism and medical tourism scales. Partial Least Squares-Structural Equation Modeling (PLS-SEM) is used to analyse the data due to their suitability for complex models and smaller sample sizes. It allows for the simultaneous estimation of multiple relationships and is robust to normal data distributions. The questionaries used a 5-point Likert scale to collect the data for constructed variables. Data was collected through online surveys, depending on the accessibility of the participants. Consent was obtained from all participants, and confidentiality was maintained.

3.3 Ethical Considerations

The study adheres to ethical research standards. Participants were informed about the study's purpose, procedures, and rights. Informed consent was obtained, and confidentiality of the data was ensured.

4. Result

4.1 Background of respondents

The data analysis begins with descriptive statistics of respondents who participated in this study. According to the statistics (Appendix 1), 50% of the participating ageing population in this study falls between 60–65 years, followed by 30% of 66–70 years, 15% 71–75 years, and 5% above 75 years old. Among 323 respondents, 65% are male, while the remaining 35% reported as female. Thus, among participants, 40% of the ageing population retired from the public sector, 35% from the private sector, and the remaining 30% reported having their own business. However, most respondents reported originating from Southeast Asian countries, while the least from South Asia, 20% from Oceania, 10% from Europe, and 5% from North America.

4.2 Measurement Model

The measurement model has been assessed through reliability and validity tests. Construct reliability and validity were evaluated to check the measurement model’s reliability, while cross-loadings and discriminant validity were considered for the validity of the measurement model. At first, Cronbach’s alpha and composite reliability were assessed to check the reliability. The results (see Table 1) indicate a greater than 0.70 value for Crocnbach’s alpha and composite reliability scores between 0.70 and 0.95,

which conformed to the threshold of required values suggested by (Hair et al., 2020). The composite value greater than 0.95 indicates homogeneity of variables and signifies measurement redundancy (Hair et al., 2020). Since the values for both Cronabch's alpha and CR attained the required threshold, internal consistency reliability was ensured. Meanwhile, AVE (average variance extracted) was assessed to check the convergent validity. Following the suggestion of (Fornell & Larcker, 1981), the AVE values must exceed 0.5 for each construct, and the results indicate a good convergent validity of all constructs.

Table 1
Reliability and Validity assessment results

Construct	Items	Loadings	α	CR	AVE	VIF	SRMR
Cultural Tourism	CT1	0.636	0.715	0.788	0.632	1.273	0.062
	CT2	0.885				1.620	
	CT3	0.841				1.499	
Digital Tourism	DT1	0.720	0.727	0.750	0.547	1.495	
	DT2	0.824				1.576	
	DT3	0.670				1.200	
	DT4	0.736				1.413	
Economic Benefits	EB1	0.857	0.828	0.883	0.652	2.128	
	EB2	0.893				2.150	
	EB3	0.808				1.709	
	EB4	0.650				1.544	
Eco Tourism	ET1	0.807	0.878	0.897	0.668	2.377	
	ET2	0.822				2.325	
	ET3	0.802				2.005	
	ET4	0.820				1.787	
	ET5	0.836				2.035	
Healthy Ageing	HA1	0.806	0.903	0.903	0.674	2.509	
	HA2	0.854				2.814	
	HA3	0.832				2.625	
	HA4	0.851				2.714	
	HA5	0.809				2.150	
	HA6	0.768				1.898	
Health Tourism	HT1	0.537	0.715	0.765	0.532	1.246	
	HT2	0.756				1.388	
	HT3	0.757				1.461	
	HT4	0.834				1.510	
Quality of Life	QL1	0.752	0.757	0.796	0.576	1.538	
	QL2	0.585				1.370	

Construct	Items	Loadings	α	CR	AVE	VIF	SRMR
	QL3	0.845				1.858	
	QL4	0.825				1.759	
Senior-freidnly services	SFS1	0.730	0.816	0.824	0.645	1.593	
	SFS2	0.816				1.861	
	SFS3	0.860				2.341	
	SFS4	0.801				1.571	

Subsequently, the HTMT (Heterotrait-Monotrait) ratio was evaluated to check discriminant validity. The results (see Table 2) demonstrate a ratio of less than 0.85, which presents good discriminant validity, according to Henseler et al. (2015). Besides, cross-loadings (see Appendix TA1) also indicate good discriminant validity for constructs.

Table 2
Heterotrait-monotrait ratio (HTMT) - Matrix

Construct	CT	DT	EB	ET	HA	HT	QL	SFS
CT								
DT	0.566							
EB	0.213	0.342						
ET	0.376	0.182	0.131					
HA	0.492	0.278	0.291	0.522				
HT	0.550	0.626	0.297	0.203	0.344			
QL	0.224	0.191	0.373	0.327	0.711	0.197		
SFS	0.320	0.141	0.096	0.404	0.380	0.200	0.287	

4.3 Structural Model

At the beginning of the structural model, the variance inflation factors (VIF) for each group of predictor variables were assessed to identify any possible collinearity-related problems, as Hair et al. (2020) suggested. As Benitez et al. (2020) and Hair et al. (2020) recommended, all VIF values in this analysis were below 3, indicating no collinearity issues in the model.

Table 3
Coefficient of determination (R2), factor effects (f2), and predictability score (Q2)

Construct	R^2	f^2	Q^2
Economic Benefit	0.076	0.082	0.038
Healthy Ageing	0.345	0.527	0.320
Quality of Life	0.380	0.613	0.102

Following the earlier relevant studies, this study also presents the coefficient of determination (referred to as R^2), the effect size (referred to as f^2), the predictive relevance (referred to as Q^2), and the path coefficients when evaluating structural models (Ma et al., 2023; Urbach & Ahlemann, 2010). The values for R^2 are 0.076 (lower impact), 0.345 (moderate impact), and 0.38 (moderate impact), based on prior studies (Ma et al., 2023). Consequently, the f2 values indicate that the variables in the model have varying degrees of influence, as shown in Table 3. In analysis, the following classification is frequently used for f^2 reference values: 0.08 (signifying a small impact size), 0.527 (signifying a high effect size), and 0.613 (signifying a high effect size) (Cohen, 1988). Subsequently, the Q^2 scores are positive and greater than zero, which attained the suggested threshold (Shmueli et al., 2019). These findings underscore the variables' vital role in the analysis, demonstrating their substantial contribution to explaining the endogenous variables.

Henceforth, the overall model appropriateness was assessed using the SRMR (standardised root mean square residual), which measures the average discrepancy between the observed and predicted correlation matrices (Ma et al., 2023). SRMR is classified as an absolute goodness-of-fit indicator. As per the criteria established by Hu and Bentler (1998), An SRMR value below 0.1 is regarded as acceptable. However, a firm criterion denotes that an SRMR value below 0.08 is preferable. The SRMR value is 0.06 for the model in the current analysis that attained the suggested threshold. Figure 2 displays the outcomes of the PLS-SEM analysis for this study.

4.4 Path Analysis and Hypothesis Testing

The present leading method, called bootstrap with 5000 iterations, is used to evaluate the statistical significance of path coefficients and the mesomeric impact (Urbach & Ahlemann, 2010). Upon examining the estimated path coefficients illustrated in Fig. 2, it is evident that there exists a positive connection between each latent variable following the hypotheses. Afterwards, the path coefficient was subjected to a significance test using the t-statistic value. A t-statistic value > 1.96 is considered statistically significant at a significance level of 0.05 (Chin, 1998). Alternatively, if it lacks significance, the hypothesis cannot be accepted.

The results obtained by utilising SmartPLS 4.0 to examine the path coefficients within the theoretical framework are displayed in Table 4. The results indicate that the t-statistic value for HT in relation to Ha

was 3.672, supporting the hypothesis of H1. The t-statistic value for DT in relation to HA was 0.68, which does not support the hypothesis H2. The magnitudes of the t-statistics for ET, CT, and SFS with HA exceeded 1.96. This suggests that the H3, H4, and H5 hypothesis paths were supported. Subsequently, when analysing the impact of HA on the QL and EB, the t-statistic values for the relevant pathways ranged from 5.674 to 19.549 in absolute terms. This supports the H6 and H7.

Table 4
Results of path analysis

H	Path	β	T-statistic	p	Decision
H1	HT -> HA	0.121	2.146	0.032	Supported
H2	DT -> HA	0.035	0.680	0.497	Not Supported
H3	ET -> HA	0.343	6.474	0.000	Supported
H4	CT -> HA	0.210	3.672	0.000	Supported
H5	SFS -> HA	0.148	2.782	0.005	Supported
H6	HA -> QL	0.620	19.549	0.000	Supported
H7	HA -> EB	0.281	5.674	0.000	Supported

4.1 Discussion

The results indicate a strong positive relationship between health tourism and healthy ageing. It supports the previous findings that highlighted that engagement in health tourism activities, such as wellness retreats, spa treatments, and medical tourism, significantly contributes to older adults' physical, mental, and social well-being (Y. Fan et al., 2024; Mrčela et al., 2015; Szromek, 2021). Health tourism provides access to specialised therapies and wellness programs that improve physical health. This aligns with the Activity Theory of Ageing, which posits that active engagement in health-promoting activities leads to better health outcomes. Participating in wellness and relaxation activities reduces stress and enhances mental health (Qiao et al., 2022; Wong & Bastrygina, 2024; Zhang et al., 2021). The holistic approach of many health tourism services supports the Socioemotional Selectivity Theory (Carstensen, 1992), suggesting that older adults seek emotionally fulfilling and stress-reducing experiences. Health tourism often involves group activities and social interactions, which help maintain social connections and prevent isolation (Zhang et al., 2021). The analysis shows a significant positive relationship between eco-tourism and healthy ageing. Activities like hiking, bird-watching, and nature exploration contribute positively to physical and mental health (Kim et al., 2015; Lukoseviciute et al., 2024). Ecotourism encourages physical activity that is good for preserving mobility and general health. A good and noteworthy correlation exists between cultural tourism and quality of life. Taking part in cultural activities, such as going to museum events and touring historical places, improves social, emotional, and cognitive health (Bratman et al., 2019; Lawton & Nahemow, 1973).

The integrated analysis shows that these tourism activities collectively enhance healthy ageing and improve the quality of life for older adults. Engaging in diverse tourism experiences provides comprehensive physical, mental, and social benefits (Balderas-Cejudo & Patterson, 2024; Dashper et al., 2021; Kim et al., 2019; Li et al., 2023; Wickramaratne et al., 2022). This combination of tourism activities, a combination of physical activity, cognitive engagement, and social interaction, promotes holistic well-being (Balderas-Cejudo & Patterson, 2024; Wickramaratne et al., 2022; Wong & Bastrygina, 2024). Participation in meaningful and enjoyable tourism activities leads to higher life satisfaction and overall quality of life. These findings highlight the need for policies that support and promote health tourism, eco-tourism, cultural tourism, and senior-friendly services as strategies for enhancing healthy ageing and quality of life. Additionally, these tourism activities generate substantial economic benefits, supporting local and national economies. Future research should continue to explore these relationships, focusing on longitudinal studies and diverse populations to further validate and expand upon these findings.

The quality of life of elderly persons is positively related to providing suitable services. These amenities include reasonably priced lodging, specialised vacation packages, and a friendly atmosphere (Koskinen & Wilska, 2019; Mrčela et al., 2015; Qiao et al., 2022). Assuring that older persons with disabilities or mobility issues have access to tourism services enables a larger involvement in tourism, which raises independence and quality of life (Chaulagain et al., 2021; Suess & Mody, 2017; Zhang et al., 2021). Following the ideas of universal design and accessibility, an inclusive tourism environment lowers obstacles and encourages social inclusion (V. De Luca et al., 2021; Wickramaratne et al., 2022). The findings show a favourable correlation between alleged economic advantages and healthy ageing through tourism activities (health tourism, ecotourism, cultural tourism, and age-friendly services). Older people greatly spend money on these tourist attractions, boosting local and national economies (da Costa Guerra et al., 2022; D. X. F. Fan et al., 2023). This supports the ‘Impact Economy’ Theory (Hannant & Burkett, 2022), which posits that tourism generates direct, indirect, and induced economic benefits and well-being. Eco-tourism promotes sustainable economic practices that benefit the environment and local communities (Kim et al., 2015, 2019; Lukoseviciute et al., 2024). However, digital tourism could not unveil a substantial impact on healthy ageing, implying that the older population prefers physical tourism more than digital tourism. The findings suggest that DHEC tourism contributes not only to individual well-being but also to broader sustainable development outcomes. By promoting healthy ageing, social participation, environmental stewardship, and economic opportunities, DHEC tourism serves as a practical mechanism for advancing SDGs 3, 8, 10, and 11. The results support the growing argument that tourism should be viewed as a strategic tool for sustainable development rather than solely an economic activity.

5. Conclusion

This study examined whether health tourism, eco-tourism, cultural tourism, and senior-friendly services enhance healthy ageing and improve quality of life and economic benefits. Using a comprehensive quantitative approach and PLS-SEM analysis, the results indicate significant positive relationships between these tourism forms and healthy ageing and quality of life. The results also showed that these

tourism-related activities enhance the real economic benefits. Participating in health and wellness travel supports the idea that good ageing is promoted by older people having better physical, mental, and social health.

The findings confirm the need to develop and expand tourism industries that particularly serve older folks. Creating conveniently accessible, amiable, and aesthetically pleasing travel experiences that promote healthy ageing and improve quality of life should be the main focus of businesses and decision-makers. Longitudinal research should be used to investigate how these tourism activities impact healthy ageing and quality of life over time. Expanding the focus to include additional people and locations might also lead to a better understanding of these connections. Finally, age-friendly services, ecotourism, cultural tourism and health tourism are necessary to promote healthy ageing and improve the quality of life for elderly adults. These tourism activities offer social, psychological, and physical benefits and contribute to economic growth and sustainability. These tourist sectors will most likely become more important as the world's population ages, underscoring the necessity of continuous research and development in this area.

Limitations and Future Studies

Though the study sample was large enough, it might not fairly represent the great variety of demographics among senior citizens globally. Bias towards particular cultural, societal, or regional aspects may limit the results' applicability. This work's cross-sectional design records data in a single instant. Cause and long-term effects are thus uncertain. Longitudinal research is necessary to evaluate the long-term impact of tourism activities on healthy ageing and quality of life. Based on self-reported data, the study may be vulnerable to response biases such as social desirability bias or false memory. Objective health and well-being indices combined with economic data would confirm the results more precisely. The study focuses on locations well-known for ecotourism, cultural tourism, health tourism, and age-friendly services. In other regions, especially those with different cultural, environmental, or economic origins, this spatial restriction might not adequately convey the spirit and outcomes of these tourism initiatives. The study ignores potential confounding variables, like socioeconomic level, access to healthcare services, or pre-existing health problems, that may influence the relationship between measured findings and tourist activities.

The long-term effects of age-friendly services, ecotourism, health tourism, and cultural tourism on healthy ageing and quality of life should be investigated using longitudinal research designs. This approach would prove causality, and changes over time would be monitored. Results from different groups in numerous countries and cultures should be more broadly applicable. This would facilitate a better comprehension of these tourism activities' effects on various population groups. Adding objective health and well-being variables like fitness assessments, medical records, and economic indicators would improve the study's validity. Using self-reported data and objective measurements can help one obtain a more complete picture of the benefits of tourism activities.

Future research should focus on more tourism that could benefit senior folks, such as adventurous, educational, and volunteer travel. Considering a variety of activities could help one comprehend more completely how different experiences promote healthy ageing and enjoyment of life. Conducting intervention studies in which specific tourism activities are carried out and monitored over time allows one to determine the direct effects of such tourism activities on health and well-being. These studies offer useful recommendations for the development of effective senior tourism programmes. Extensive economic research must be carried out to more precisely determine the financial benefits of tourism activities. Part of this might involve assessing the direct, indirect, and induced economic consequences and the cost-effectiveness of boosting tourist sectors.

The focus of the next research should be on turning the findings into practical suggestions for industry stakeholders and decision-makers. This involves developing strategies to promote accessible, inclusive, and ecologically sustainable senior citizen travel opportunities. Addressing these limitations and following these potential research areas, academics can add to the corpus of knowledge about the role of tourism in healthy ageing, quality of life, and economic gain in particular locations or regions. This will eventually influence more comprehensive and effective tourist regulations and procedures.

Declarations

[1]. Funding: This work was supported by the United International University, Bangladesh, 2655, and American International University, Bangladesh, 4401

[2]. Clinical Trial Number: Not applicable.

[3]. Consent to Participate: Informed consent was obtained from all individual participants before they participated in the study. Participation was voluntary, and respondents were informed about the purpose of the research, as well as the anonymity and confidentiality of their responses.

[4]. Consent to Publish Declaration: Not applicable.

[5]. Data Availability: The datasets generated and/or analysed during the current study are available from the corresponding author upon reasonable request.

[6]. Ethical Approval: This study was conducted in full compliance with ethical standards for research involving human participants. Ethical approval was granted by the Institutional Review Boards (or equivalent research ethics committees) of United International University (Bangladesh) and American International University-Bangladesh (AIUB), under the respective research grant/project support numbers UIU-2024-REC-4782 and AIUB-2024-RES-3194

Author Contribution

[1]. SAO - Proofread, searched for the appropriate journal for submission, improved the title of the paper, literature review, reviewed the abstract, reviewed the manuscript and final submission to Discover Sustainability.[2]. MHM - Wrote part of the manuscript, text, main data collection in Turkey, literature review, and reviewed the manuscript[3]. TYL - Proofread, literature review and reviewed the manuscript[4]. MTH- Developed the research methodology and reviewed the manuscript[5]. JBS - Involved in the data analysis, reviewed the manuscript, and wrote part of the manuscript text[6]. MFA - Data collection, reviewed the manuscript, research methodology and data analysis[7]. RBS - Data analysis, reviewed the manuscript and wrote part of the manuscript text[8]. NMS-Data analysis, reviewed the manuscript and the literature review.

References

1. Akhtar N, Khan N, Mahroof Khan M, Ashraf S, Hashmi MS, Khan MM, Hishan SS. Post-COVID 19 Tourism: Will Digital Tourism Replace. Mass Tourism? Sustainability. 2021;13(10):5352. https://doi.org/10.3390/su13105352.
2. Almeida-Santana A, David-Negre T, Moreno-Gil S. New digital tourism ecosystem: understanding the relationship between information sources and sharing economy platforms. Int J Tourism Cities. 2020;6(2):335–45. https://doi.org/10.1108/IJTC-09-2019-0173.
3. Balderas-Cejudo A, Patterson I. Beyond Tourism: The Importance of Baby Boomer Generation Volunteers. J Popul Ageing. 2024. https://doi.org/10.1007/s12062-024-09445-w.
4. Balderas-Cejudo A, Patterson I, Leeson W. G. (2021). Gastronomic tourism and the senior foodies market. In *Gastronomy and Food Science* (pp. 193–204). Elsevier. https://doi.org/10.1016/B978-0-12-820057-5.00010-8
5. Bandura A. Social cognitive theory: An agentic perspective. Asian J Soc Psychol. 1999;2:21–41.
6. BBC. (2020). How digitalisation is revolutionising the travel industry. BBC Travel. https://www.bbc.com/storyworks/travel/the-new-tourism-trend/technology-redefine-tourism-industry
7. Belova AV, Fedina-Zhurbina IV. (2023). Kaliningrad Region as Sustainable Destination for Rehabilitation and Medical Tourism. In *SDGs in the European Region. Implementing the UN Sustainable Development Goals – Regional Perspectives* (pp. 917–940). Springer. https://doi.org/10.1007/978-3-031-17461-2_50
8. Benitez J, Henseler J, Castillo A, Schuberth F. How to perform and report an impactful analysis using partial least squares: Guidelines for confirmatory and explanatory IS research. Inf Manag. 2020;57(2):103168. https://doi.org/10.1016/j.im.2019.05.003.
9. Bratman GN, Anderson CB, Berman MG, Cochran B, de Vries S, Flanders J, Folke C, Frumkin H, Gross JJ, Hartig T, Kahn PH, Kuo M, Lawler JJ, Levin PS, Lindahl T, Meyer-Lindenberg A, Mitchell R, Ouyang Z, Roe J, Daily GC. Nature and mental health: An ecosystem service perspective. Sci Adv. 2019;5(7). https://doi.org/10.1126/sciadv.aax0903.

10. Carstensen LL. Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. Psychol Aging. 1992;7(3):331–8. https://doi.org/10.1037/0882-7974.7.3.331.
11. Chaulagain S, Pizam A, Wang Y, Severt D, Oetjen R. Factors affecting seniors' decision to relocate to senior living communities. Int J Hospitality Manage. 2021;95:102920. https://doi.org/10.1016/j.ijhm.2021.102920.
12. Chee SY. Navigating the twilight years: Supporting older adults' orientation and wayfinding in senior living facilities. Arch Gerontol Geriatr. 2023;115:105135. https://doi.org/10.1016/j.archger.2023.105135.
13. Chee SY. Savoring the Past, Nourishing the Present: Uncovering the Essence of Multicultural Mealtime Experiences in Senior Living Facilities. J Gerontol Soc Work. 2024;67(3):322–48. https://doi.org/10.1080/01634372.2023.2264894.
14. Chin WW. (1998). The partial least squares approach to structural equation modelling. In Marcoulides G. A, editor. *Modern Methods for Business Research*, *295*(2), 295–336.
15. Cohen J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Routledge. https://doi.org/10.4324/9780203771587
16. da Guerra C, dos Santos RJ, N. N. P., Gonçalves EC. (2022). Health and Wellness Tourism: Contributions to a Local Sustainable Development Strategy. In *Advances in Science, Technology & Innovation ((ASTI))* (pp. 219–233). Springer. https://doi.org/10.1007/978-3-031-07819-4_19
17. Dashper K, Li S, He M, Zhang P, Lyu T. Ageing, volunteering and tourism: An Asian perspective. Annals Tourism Res. 2021;89:103248. https://doi.org/10.1016/j.annals.2021.103248.
18. De Luca G, Shirvani Dastgerdi A, Francini C, Liberatore G. Sustainable Cultural Heritage Planning and Management of Overtourism in Art Cities: Lessons from Atlas World Heritage. Sustainability. 2020;12(9):3929. https://doi.org/10.3390/su12093929.
19. De Luca V, Tramontano G, Riccio L, Trama U, Buono P, Losasso M, Bracale UM, Annuzzi G, Zampetti R, Cacciatore F, Vallefuoco G, Lombardi A, Marro A, Melone MAB, Ponsiglione C, Chiusano ML, Bracale G, Cafiero G, Crudeli A, Illario M. One Health Approach for Health Innovation and Active Aging in Campania (Italy). Front Public Health. 2021;9(May):1–11. https://doi.org/10.3389/fpubh.2021.658959.
20. Fan DXF, Buhalis D, Fragkaki E, Tsai Y-R. Achieving Senior Tourists' Active Aging Through Value Co–creation: A Customer-Dominant Logic Perspective. J Travel Res. 2023. https://doi.org/10.1177/00472875231214733.
21. Fan Y, Goh E, Isa SM, Yang S. 30 years of healthy ageing research in tourism and hospitality: research trends and implications for future research. Serv Ind J. 2024;1–38. https://doi.org/10.1080/02642069.2024.2334775.
22. Fauziah CL. The Geography of Accessibility: Assessing the Malaysian Approach toCOVID-19 Pandemic Management. Geografia: Malaysian J Soc Space. 2020;8(2):66–91. https://doi.org/ttps://doi.org/10.37134/geografi.vol8.2.4.2020.

23. Fornell C, Larcker D. Structural equation models with unobservable variables and measurement error: Algebra and statistics. J Mark Res. 1981;18(3):382–8.
24. Hair JF, Howard MC, Nitzl C. Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. J Bus Res. 2020;109(November):101–10. https://doi.org/10.1016/j.jbusres.2019.11.069.
25. Hanefeld J, Lunt N, Smith R, Horsfall D. Why do medical tourists travel to where they do? The role of networks in determining medical travel. Soc Sci Med. 2015;124:356–63. https://doi.org/10.1016/j.socscimed.2014.05.016.
26. Hannant A, Burkett I. (2022). *Introducing the Impact Economy*. Griffith Centre for Systems Innovation. https://www.griffith.edu.au/engage/professional-learning/content-centre/impact-economy-1
27. Havighurst RJ. Successful Aging. Gerontologist. 1961;1(1):8–13. https://doi.org/10.1093/geront/1.1.8.
28. Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. J Acad Mark Sci. 2015;43(1):115–35. https://doi.org/10.1007/s11747-014-0403-8.
29. Hu F, Wen J, Phau I, Ying T, Aston J, Wang W. The role of tourism in healthy aging: An interdisciplinary literature review and conceptual model. J Hospitality Tourism Manage. 2023;56:356–66. https://doi.org/10.1016/j.jhtm.2023.07.013.
30. Hu L, Bentler PM. Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. Psychol Methods. 1998;3(4):424–53. https://doi.org/10.1037/1082-989X.3.4.424.
31. Hung K, Lu J. Active living in later life: An overview of aging studies in hospitality and tourism journals. Int J Hospitality Manage. 2016;53:133–44. https://doi.org/10.1016/j.ijhm.2015.10.008.
32. Iaccarino G, Grassi G, Borghi C, Ferri C, Salvetti M, Volpe M, Cicero AFG, Minuz P, Muiesan ML, Mulatero P, Mulè G, Pucci G, Savoia C, Sechi L, Carugo S, Fallo F, Giannattasio C, Grassi D, Letizia C, Viale P. Age and Multimorbidity Predict Death Among COVID-19 Patients. Hypertension. 2020;76(2):366–72. https://doi.org/10.1161/HYPERTENSIONAHA.120.15324.
33. Kalia P, Mladenović D, Acevedo-Duque Á. Decoding the Trends and the Emerging Research Directions of Digital Tourism in the Last Three Decades: A Bibliometric Analysis. SAGE Open. 2022;12(4):215824402211281. https://doi.org/10.1177/21582440221128179.
34. Kim H, Lee S, Uysal M, Kim J, Ahn K. Nature-Based Tourism: Motivation and Subjective Well-Being. J Travel Tourism Mark. 2015;32(sup1):S76–96. https://doi.org/10.1080/10548408.2014.997958.
35. Kim H, Uysal M, Joseph Sirgy M. (2019). Seniors: Quality of Life and Travel/Tourism. In *Best Practices in Hospitality and Tourism Marketing and Management. Applying Quality of Life Research* (pp. 241–253). Springer. https://doi.org/10.1007/978-3-319-91692-7_12
36. Koskinen V, Wilska T-A. Identifying and understanding spa tourists' wellness attitudes. Scandinavian J Hospitality Tourism. 2019;19(3):259–77. https://doi.org/10.1080/15022250.2018.1467276.

37. Lawton MP, Nahemow L. (1973). Ecology and the aging process. In *The psychology of adult development and aging.* (pp. 619–674). American Psychological Association. https://doi.org/10.1037/10044-020
38. Li Q, Guo Z, Hu F, Xiao M, Zhang Q, Wen J, Ying T, Zheng D, Wang Y, Yang S, Hou H. (2023). Tourism experiences reduce the risk of cognitive impairment in the Chinese older adult: a prospective cohort study. *Frontiers in Public Health*, *11*. https://doi.org/10.3389/fpubh.2023.1271319
39. Lindner S, Illing K, Sommer J, Krajnc-Nikolić T, Harer J, Kurre C, Lautner K, Hauser M, Grabar D, Graf-Stelzl R, Korn C, Pilz K, Ritter B, Roller-Wirnsberger R. Development of a Binational Framework for Active and Healthy Ageing (AHA) Bridging Austria and Slovenia in a Thermal Spa Region. Int J Environ Res Public Health. 2021;18(2):639. https://doi.org/10.3390/ijerph18020639.
40. Lukoseviciute G, Henriques CN, Pereira LN, Panagopoulos T. Participatory development and management of eco-cultural trails in sustainable tourism destinations. J Outdoor Recreation Tourism. 2024;47(June):100779. https://doi.org/10.1016/j.jort.2024.100779.
41. Ma L, Zhang X, Dong L. Enhancing Sustainable Performance: The Innovative Strategy of Digital Transformation Leading Green Collaborative Management. Sustainability. 2023;15(17):13085. https://doi.org/10.3390/su151713085.
42. Marois G, Muttarak R, Scherbov S. Assessing the potential impact of COVID-19 on life expectancy. PLoS ONE. 2020;15(9):e0238678. https://doi.org/10.1371/journal.pone.0238678.
43. Mrčela NT, Borovac JA, Vrdoljak D, Grazio S, Tikvica Luetić A, Tomek-Roksandić S. When elders choose: Which factors could influence the decision-making among elderly in the selection of health tourism services? Med Hypotheses. 2015;85(6):898–904. https://doi.org/10.1016/j.mehy.2015.09.013.
44. OECD. Preparing tourism businesses for the digital future. OECD tourism trends and Policies. OECD Publishing; 2020. pp. 59–85.
45. Patterson I, Balderas-Cejudo A. Baby boomers and their growing interest in spa and wellness tourism. Int J Spa Wellness. 2022;5(3):237–49. https://doi.org/10.1080/24721735.2022.2107801.
46. Preko A, Amoako GK, Dzogbenuku RK, Kosiba J. Digital tourism experience for tourist site revisit: an empirical view from Ghana. J Hospitality Tourism Insights. 2023;6(2):779–96. https://doi.org/10.1108/JHTI-10-2021-0294.
47. Pretty J, Peacock J, Sellens M, Griffin M. The mental and physical health outcomes of green exercise. Int J Environ Health Res. 2005;15(5):319–37. https://doi.org/10.1080/09603120500155963.
48. Qiao G, Ding L, Xiang K, Prideaux B, Xu J. Understanding the Value of Tourism to Seniors' Health and Positive Aging. Int J Environ Res Public Health. 2022;19(3):1476. https://doi.org/10.3390/ijerph19031476.
49. Ranasinghe R, Karunarathna C, Pradeepamali J. After Corona (COVID-19) Impacts on Global Poverty and Recovery of Tourism Based Service Economies: An Appraisal. SSRN Electron J. 2020. https://doi.org/10.2139/ssrn.3591259.

50. Regalado F, Ortet CP, Ribeiro T, Veloso AI. (2024). Navigating Paris Digitally: An Exploratory Research of 360º Immersive Videos with Portuguese Participants. In *Human Aspects of IT for the Aged Population. HCII 2024. Lecture Notes in Computer Science* (pp. 261–278). Springer. https://doi.org/10.1007/978-3-031-61546-7_17
51. Saura JR, Reyes-Menendez A, Palos-Sanchez PR. (2020). The Digital Tourism Business. In *Digital marketing strategies for tourism, hospitality, and airline industries* (pp. 1–22). IGI Global. https://doi.org/10.4018/978-1-5225-9783-4.ch001
52. Shmueli G, Sarstedt M, Hair JF, Cheah JH, Ting H, Vaithilingam S, Ringle CM. Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. Eur J Mark. 2019;53(11):2322–47. https://doi.org/10.1108/EJM-02-2019-0189.
53. Suess C, Mody M. Hospitality healthscapes: A conjoint analysis approach to understanding patient responses to hotel-like hospital rooms. Int J Hospitality Manage. 2017;61:59–72. https://doi.org/10.1016/j.ijhm.2016.11.004.
54. Szromek AR. The sustainable business model of spa tourism enterprise—results of research carried out in Poland. J Open Innovation: Technol Market Complex. 2021;7(1):1–20. https://doi.org/10.3390/joitmc7010073.
55. Teles S, Ribeiro O. (2019). Activity Theory. In *Encyclopedia of Gerontology and Population Aging* (pp. 1–8). Springer International Publishing. https://doi.org/10.1007/978-3-319-69892-2_748-1
56. UNDP. (2015). *Aging: Social Policy and Development Policy*.
57. Urbach N, Ahlemann F. Structural equation modeling in information systems research using Partial Least Squares. J Inform Technol Theory Application. 2010;11(2):5–40.
58. Vigolo V. (2017). Population Aging: Challenges and Opportunities for the Tourism Industry. In *Older Tourist Behavior and Marketing Tools. Tourism, Hospitality & Event Management* (pp. 3–23). Springer. https://doi.org/10.1007/978-3-319-47735-0_1
59. WHO. Integrated Care for Older People: Guidelines on Community-Level Interventions to Manage Declines in Intrinsic Capacity. World Health Organization; 2017.
60. WHO. (2020). *UN Decade of Healthy Ageing: Plan of Action 2021–2030*. https://cdn.who.int/media/docs/default-source/decade-of-healthy-ageing/decade-proposal-final-apr2020-en.pdf?sfvrsn=b4b75ebc_28&download=true
61. Wickramaratne PJ, Yangchen T, Lepow L, Patra BG, Glicksburg B, Talati A, Adekkanattu P, Ryu E, Biernacka JM, Charney A, Mann JJ, Pathak J, Olfson M, Weissman MM. Social connectedness as a determinant of mental health: A scoping review. PLoS ONE. 2022;17(10):e0275004. https://doi.org/10.1371/journal.pone.0275004.
62. Wong BKM, Bastrygina T. (2024). Healthcare travel resilience through digital healthcare adoption: lessons from Malaysia during the COVID-19 pandemic. In *Digital Healthcare in Asia and Gulf Region for Healthy Aging and More Inclusive Societies* (pp. 241–263). Elsevier. https://doi.org/10.1016/B978-0-443-23637-2.00010-2

63. Zhang Q, Zhang H, Xu H. Health tourism destinations as therapeutic landscapes: Understanding the health perceptions of senior seasonal migrants. Soc Sci Med. 2021;279:113951. https://doi.org/10.1016/j.socscimed.2021.113951.
64. Arachchi R, Yajid M, Khatibi A. Eco-Tourism Practices in Sri Lankan Eco Resorts: An Analysis of Satisfaction and Behavioral Intention of Eco-Tourists. Int J Bus Social Sci. 2015;6(10):211–26.
65. Asadi R. Strategies for development of Iran cultural tourism. Aust J Basic Appl Sci. 2011;5(8):1021–34.
66. Evans DR, Burns JE, Robinson WE, Garrett OJ. The quality of life questionnaire: A multidimensional measure. Am J Community Psychol. 1985;13(3):305.
67. Ghasemnejhad Z, Majidi Ghahroodi N, Jalilvand M. Investigating the Challenges of Digital Tourism Development Case Study: Tehran City. urban tourism. 2021;8(3):79–90.
68. Hanney S, Davies A, Buxton M. Assessing benefits from health research projects: can we use questionnaires instead of case studies? Res Evaluation. 1999;8(3):189–99.
69. Ng TP, Gwee X, Chua DQ, Wee SL, Cheong CY, Yap PLK, Yap KB. The Healthy Ageing Questionnaire Index: Validation in the Singapore Longitudinal Ageing Study. Gerontology. 2023;69(11):1358–67.
70. Zhang M, Pan Y. Design of Sustainable Senior-Friendly Community Transportation Services. Sustainability. 2021;13(23):13078.

Figures

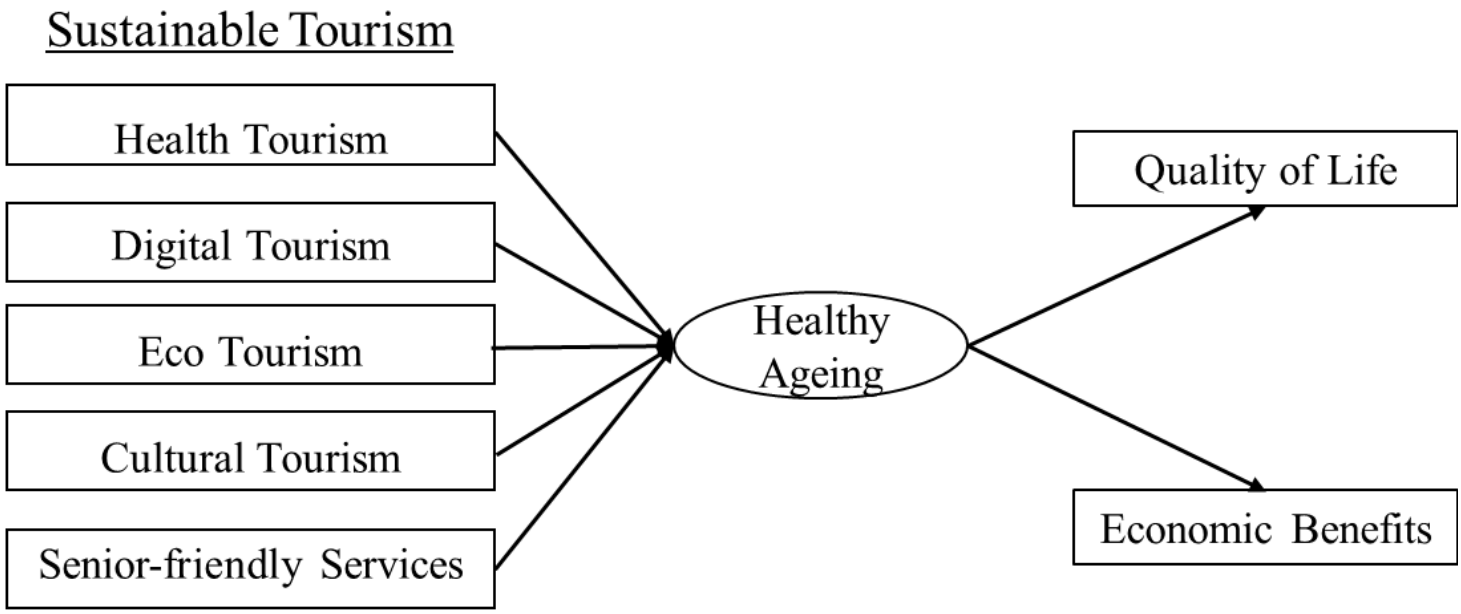


Figure 1

Conceptual framework, Authors own creation.

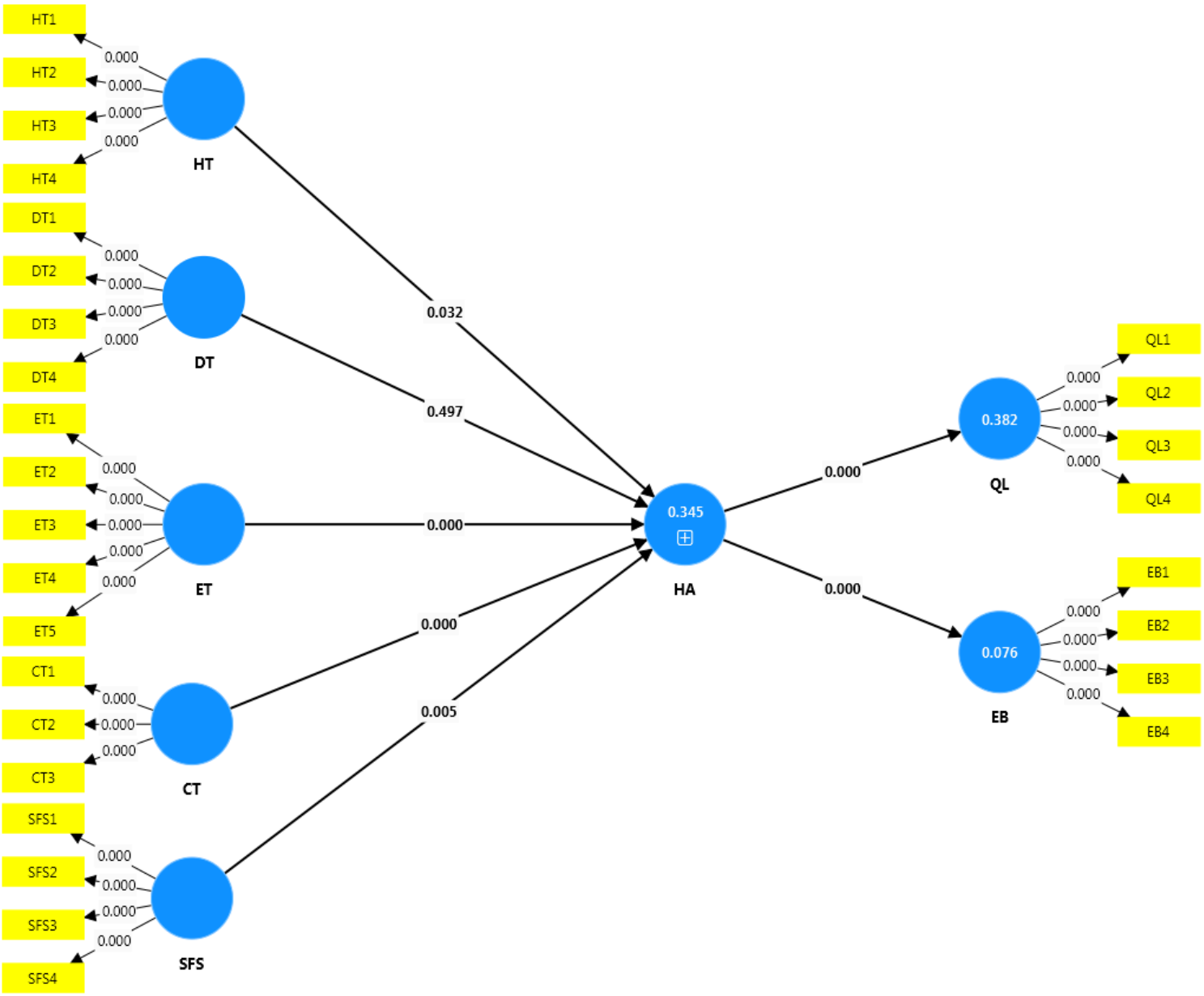


Figure 2

Structural Model Path Analysis, Source: SmartPLS 4.0

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- OnlineAppendix.docx