Contents lists available at EKB

Minia Journal of Tourism and Hospitality Research

Journal homepage: https://mjthr.journals.ekb.eg/

The Role of Artificial Intelligence to Enhance Health Tourism Applications in Egyptian Tourist Destinations

Hussein Abdel Wahab Abdel Rady

Associate Professor, Tourism Studies Department, Faculty of Tourism and Hotels, Minia University

Keywords

Artificial Intelligence (AI), Applications, Health Tourism, Tourist Destinations, Egypt.

Abstract

Nowadays, advanced technology provides several benefits. Technology is crucial in terms of time, cost, and easy access to information, especially in activities like health tourism. The ability to imitate human intelligence forces us to position Artificial Intelligence (AI) applications with a fundamentally different approach. Artificial intelligence may help produce more focused results in a variety of ways, notably by analyzing the advantages. This paper discusses some of the most significant potential and obstacles associated with applying AI to health tourism. The research aims to explore the utilization of AI as a new trend to strengthen health tourism applications in Egyptian tourist destinations. The methodology of the study was based on descriptive analysis using 117 questionnaires distributed to stakeholders in medical tourism. Several statistical methods were used in the research. The results indicate that the government is standardizing digital infrastructure and data collection in order to improve interoperability and simplify the implementation of AI-powered health services across healthcare systems. This study recommends that the government implement the first AI strategy, the Egypt Artificial Intelligence Strategy, encourage enterprises to invest in AI, and promote public-private collaborations in the fields of AI and health. It is necessary to provide virtual platforms to coordinate health care services before, during, and after they are obtained, allowing customers to have a complete experience, including initial inquiries, coordination with service providers, and follow-up after receiving the service, as well as incorporating sustainable and environmentally friendly practices into medical tourism.

Printed ISSN 2357-0652 **Online ISSN** 2735-4741

1. Introduction

Artificial intelligence is regarded as extremely intriguing and novel in terms of scientific facts. It is actively involved in several sciences (Valeri & Baggio, 2020). Artificial intelligence has been a major factor in the growth of the travel and tourism sector in recent years. In the travel industry, new technologies emerge daily (Ivanov & Webster, 2019). AI may be defined as a high-level system that facilitates the empowerment and augmentation of operational performance and functionality. It also adapts new, highly complicated applications to be deployed in both human-like and non-humanoid applications (Kavut, 2022).

Medical advancements have always led to a steady evolution in health care (Lobo, 2020; Allen, 2019). However, new diseases necessitate new treatments, which are not always accessible in one's preferred location. Because of this, technical developments are not only enhancing the precision and caliber of medical care but also enabling people to access healthcare services more quickly and conveniently, completely changing the need for medical travel. The need for more individualized medical equipment and sophisticated, cultural medical treatments has been gradually included in health tourism (Bhattacharyya, 2020; Medical Technology, 2020; Hong, 2016).

Artificial intelligence has the potential to improve public health by identifying health risks and providing remedies. AI is being used to facilitate remote consultations between health professionals and patients, providing necessary treatment suggestions (Luxton, 2016). This makes AI an invaluable tool for engagement and communication for both healthcare professionals and patients worldwide, as well as for health tourists. In an effort to become a unique destination for health tourism, Egypt has taken artificial intelligence seriously in managing the expansion of its healthcare industry.

Research Problem

The problem research focuses on the scarcity of studies on health tourism in Egypt. Despite the significant growth in interest in medical tourism over the last decade, there is no established method for assessing the important qualities of medical tourism locations. Health tourism is quickly increasing throughout the world, and it is past time for the government to take note. Health tourism is a rapidly growing global phenomenon that mainly relies on AI, innovation, and knowledge management. To be innovative and systematic in medical tourism, hospitals must improve their information management and artificial intelligence procedures.

Research Questions

RQ1: What is the role of artificial intelligence in health tourism establishments?
RQ2: What are the benefits of AI in health tourism establishments?
RQ3: What are the obstacles to AI in Egypt's health tourism industry?
RQ4: What are the government efforts to enhance the role of AI in health tourism applications at Egyptian tourist destinations?

Research Aims

The aim of this research is to investigate the application of artificial intelligence to improve health tourism applications in Egyptian tourist destinations. The objectives of this research are as follows:

1. Determining health tourism applications in Egyptian tourist destinations.
2. Identifying the influence of AI on the development of health tourism apps.
3. Analyzing the benefits of artificial intelligence to enhance health tourism applications in Egyptian tourist destinations.
4. Examining the challenges facing artificial intelligence to enhance health tourism applications in Egyptian tourist destinations.
5. Exploring efforts to enhance the role of AI in health tourism applications at Egyptian tourist destinations

Research importance

This research is important because it deals with artificial intelligence. Therefore, it is important to understand to what extent AI, as a modern trend, contributes to the strengthening of health tourism in the tourist destinations of Egypt. Therefore, this study can provide information on the contribution of artificial intelligence techniques to the strengthening of health tourism in the tourism destinations of Egypt. This research analyzed the role of AI in the transformation and revival of the medical tourism sector and how the sector will change by highlighting the role of AI. In the era of Industrial Revolution 4.0, the healthcare sector is growing faster than ever before. This includes health tourism as well as the emerging trend of interconnected health care (for example, mobile healthcare technology and digital health).

2. Literature Review

2.1. Artificial intelligence

Artificial intelligence technology is one of the most significant original breakthroughs that have altered several industries throughout the world in modern technologically sophisticated times (Russell and Norvig, 2016). According to Bajpai, Biberman, and Yip Yingxin (2020), artificial intelligence is a new general-purpose technology that has the potential to completely transform practically every sector. AI is a cutting-edge technology that has revolutionized many industries and is being heralded as a key enabler of equitable access to quality health care, including the development and enhancement of diagnostic tools, personalized medical treatment, disease prevention, and novel therapies. The use of AI in the medical field is expected to increase tenfold over the next five-year period (Perry, 2016). Artificial intelligence (AI) enables healthcare professionals to gain insight into the day-to-day needs and behaviors of their patients, empowering consumers to take control over their health and wellbeing and enabling them to better advise, support, and guide patients on how to maintain their health (Horne *et al.*, 2020; Ghassemi *et al.*, 2020). This is noteworthy because AI seems to be the industry's future (Deniz *et al.*, 2023).

2.2. Health Tourism

Health tourism refers to the practice of seeking medical care outside of one's own country. Health tourism is rapidly expanding and is already a worldwide phenomenon worth billions of dollars. However, health tourism remains a specialty within the tourism sector (Ghassemi *et al.*, 2020; Sevim & Sevim, 2019). All observable and measurable services and activities aimed at enhancing visitors' health and well-being are included in the category of health tourism (UNTWO, 2018).

Egypt is distinguished by its unique geographical location, as it is in the center of the Arab world and is considered one of the most important medical destinations for

tourists coming from Arab countries or from Europe. Egypt is distinguished by its numerous medical expertise' in all health fields, in addition to natural healing places, historical archaeological sites, and natural landscapes. There are hundreds of mineral springs and medical natural wells in Egypt, rich in mineral elements. Egypt also has water resources for healing purposes, with a suitable salinity level for treating some various diseases, and it also has fresh water wells suitable for drinking. Egypt has sand dunes that are equal in value to the importance of mineral water from a therapeutic standpoint, and they contain radioactive elements that are beneficial in rheumatism and spinal diseases (Mohamed *et al.,* 2020). The following are significant prospective areas of health informatics application in medical tourism (Peyman *et al.,* 2017):

- ***Electronic Health Cards (EHC)***: Types of EHC There are two categories of EHC. The first category is the administrative category. This category includes information about your insurance status, overseas treatment, and prescriptions. The second category is the medical category. This category is optional. You can choose to include medication information or clinical information. You can also submit your own medical data (Viziteu, 2008).
- ***Electronic Health Record (EHR)*** is an IT system that relies on the technical and informational structure of medical organizations. The EHR system will enhance the ability of medical tourism institutions to attract medical tourists from developed countries. The personal medical information of the tourists can be accessed across borders through a network using EHR (Viziteu, 2008).
- ***Telemedicine*** is the practice of treating or monitoring patients at a distance using information technology, which can range from simple instruments to complex systems. Through a teleconsultation with a doctor, a patient travelling abroad can use telemedicine to get trustworthy information about their health status and select the most appropriate course of treatment for their trip. (Herrick, 2007).
- ***Medical Tourism Recommender Systems (RS) and Decision Support Systems (DSS)*** are extensively used methods for avoiding information overload and offering travel suggestions to tourists. RSs are presently used in a wide range of areas, with a variety of features and platforms, including web-based, mobile, intelligent, DSS, ranking systems, scheduling systems, routing applications, location systems, and so on. The majority of these systems have components connected to artificial intelligence (Sharda, 2009).

2.3. Medical Tourism Industry Stakeholders

The government, represented by the Cabinet, the Ministries of Health and Population, and Tourism, plays a vital role in creating and building the required governance structure for medical tourism, allowing the business to grow and thrive. Medical tourism facilitators and hospital representatives are considered at the forefront of the medical tourism sector. Travel is an essential component of the medical tourism experience. It is critical to have travel agencies that can manage this sort of traveller in order to properly meet their particular demands. Medical tourists might fund their travel using a variety of techniques. Medical service providers include hospitals, specialized medical centers, clinics, and health and wellness resorts, which are the primary shareholders in the medical tourism sector. The stakeholder categories for medical tourism are displayed in the following fig. 1 (Gan & Frederick, 2011).

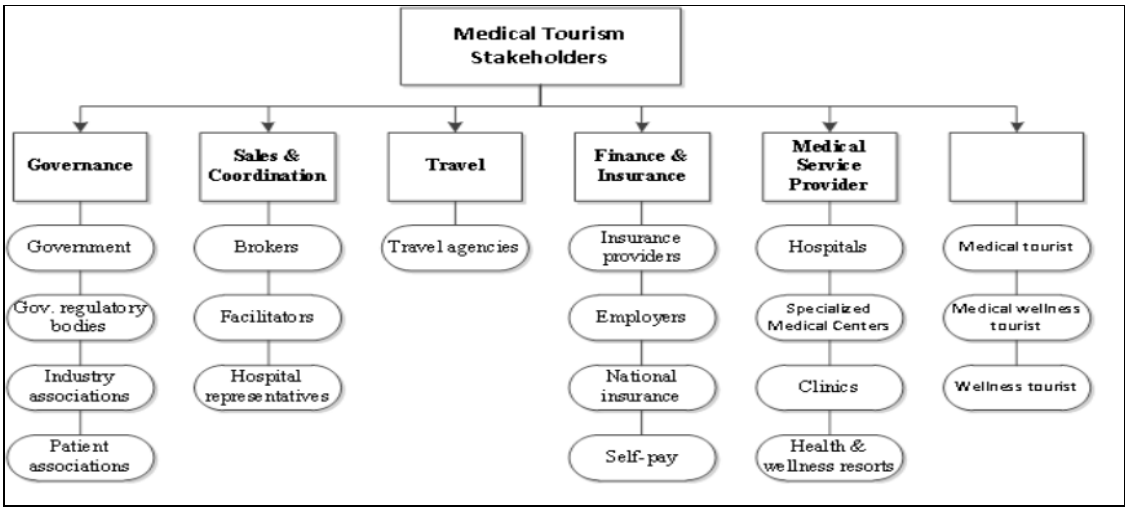

Fig 1: Medical Tourism Stakeholders
Source: (Gan & Frederick, 2011)

2.4.The uses of AI in Healthcare

There are three main types of use cases for AI in healthcare (Paul *et al.*, 2018; Raghupathi and Raghupathi, 2014):

- **Descriptive:** This is done by calculating the number of events that have already taken place and then using this information to identify trends and other insights.
- **Predictive:** It is the process of predicting the future using descriptive data, and
- **Prescriptive:** In addition to identifying trends and forecasting the future, it also identifies potential treatments in public health and research and development (R&D) clinical trials.

2.5. Artificial Intelligence in Health Tourism

These technologies enhance the services and competitiveness of health tourism sites, attracting health travellers. AI has expanded the use of digital technologies, offered access to massive data sources, and contributed to tourists' preference for them (Yıldız, 2021). According to Aykın (2020**)**, new trends in health tourism rely heavily on technology to compete. Ease of use has become the most important benefit for tourists, and ease of use has a direct impact on tourist preferences (Aydoğmuş & Aykın, 2020). These technologies include facial recognition software, virtual reality programmes, chatbots, and robots; extended reality (XR) applications in healthcare; block chain technology; and metaverse practices in medical tourism.

2.5.1. Facial recognition

Artificial intelligence technology known as facial recognition is gaining popularity and finding extensive use in several sectors. Facial recognition is being widely applied in the medical industry to enhance therapeutic results (Bowyer, 2004).

2.5.2. Virtual reality

Virtual reality applications are commonly used in medical tourism. Virtual treatment tours, presented in the form of three D-videos, show the hospital's surroundings and services. This allows clients to see the hospital's features in real time (Barnes, 2016).

2.5.3. The virtual rehabilitation

The healthcare tourism industry will benefit from the application as well. It's a system that tracks range of motion using wearable sensors. According to Li *et al.* (2019), the data is analyzed so that therapists can use a mobile device to provide patients with real-time advice.

2.5.4. Chat-bots

Vocal voice-based messaging is how chatbots respond to consumer inquiries (Hassan & Bellos, 2022). Using chatbots for hospitality, you may provide a first-rate visitor experience. Hospitals don't often use chatbots.

2.5.5. Robots

Robotics is one of the newest applications of artificial intelligence (AI) to impact the travel industry (Tussyadiah, 2020; Park, 2020; Tussyadiah *et al.*, 2020). According to Seyito_glu and Ivanov (2021), both service providers and customers must adjust as the robotic service system offers a socially and geographically remote service. Robots can effectively be employed to provide physical separation between hosts and visitors during pandemics.

2.5.6. Extended Reality (XR) Applications in Healthcare

- XR uses can reduce the need for medicinal medicines in chronic and acute pain **(**Trost *et al.*, 2021; Thomason, 2021).
- VR-compatible Wii games (glasses, headphones, gloves, etc.) may be utilized for many things, such as the rehabilitation of patients with Parkinson's disease (who need physical therapy), the treatment of burn patients (by distracting them with a virtual world), and patient education. It is utilized in situations intended for therapy (Yılmaz *et al.*, 2022).
- AccuVein uses augmented reality (AR) technology to secure vascular access in real-time, allowing patients to open it in a single effort (AccuVein, 2024).

2.5.7. Block chain technology

In recent years, block chain technology has become increasingly popular as a way to enhance the security and efficiency of health data within the health tourism industry (Iryo Network, 2018). The use of block chains may reduce the need for in-person consultations with health tourists, especially for post-return follow-up visits, making the experience more convenient and cost-effective (Wong & Hazley, 2020).

2.5.8. Metaverse practices in medical tourism

The metaverse will enable simulation, imaging, patient care management, rehabilitation, and health management. The use of augmented reality (AR) and virtual reality (VR) can help patients complete their treatments more quickly. AR images, like CT imaging, can be projected directly onto the patient's body. Physician practitioners can see the patient's internal anatomy even when they are not moving. This technology can be used by care teams along with point of care (POC) radiography (Thomason, 2021; Ahmadi et al., 2022).

2.6. Advantages of AI in Healthcare

AI has a wide range of potential applications in healthcare. Some of these applications include mining medical records, devising treatment plans, anticipating health occurrences, making better choices and decisions, and solving public health challenges such as identifying at-risk populations for any illness through the analysis of massive amounts of real-time data (Gupta and Kumari 2018). One of the most significant advantages of AI in healthcare is that it has the potential to be extremely beneficial in locations where human resources are few, particularly in rural and distant regions. AI can assist with (Malhotra and Roy 2019):

- Creating digital repositories of health data with sufficient annotations to enable machine learning applications .
- Developing a clinical decision support system at the federal level that might help healthcare professionals with less experience handle common clinical problems.
- Implementing digital self-learning technologies to enhance healthcare in areas such as pathology, genetics, and radiology.

3. Research Methodology

This study is descriptive-analytical, as analytical research is a subset of descriptive research (Collis & Hussey, 2014). The research intends to analyze the role of AI in improving health tourism applications in Egyptian tourist destinations. A three-point Likert scale questionnaire was used as the major data collection tool (Brougham & Haar, 2017; Koo et al., 2021; Li, Bonn, & Ye, 2019). The scale was developed to evaluate AI applications, specifically health tourism applications in Egyptian tourist destinations.

3.1. Data Collection and Sample

The researcher disseminated the questionnaire to a number of (117) respondents, including the Ministry of Tourism and Antiquities, the General Authority for Health Accreditation and Control, Egyptian health facilities accredited by GAHAR, the Managing Committee of the Chamber of Health Care Providers in the Private Sector, representatives from the private sector representing hospitals, health authorities, tourism institutions, and travel agencies, and the Egyptian Foundation for Medical Tourism and Environmental Hospitalization during the Second International Conference on Egyptian Health Tourism Applications.

3.2.Questionnaire Design and Measure

The study aims to explore the role of artificial intelligence techniques as a modern trend in reinforcing health tourism applications in Egyptian tourist destinations. To achieve that, this research used a questionnaire instrument with six sections. The first section contains the socio-demographic profile of respondents. The second section contained study-related data. The third section contained nine variables representing the role of artificial intelligence in health tourism establishments. The fourth section contained 12 variables representing the benefits of AI in health tourism establishments. The fifth section contained seven challenges facing the application of artificial intelligence techniques in the Egyptian health tourism sector. The sixth section contained eight variables, representing the government's efforts to enhance the role of AI in health tourism applications at Egyptian tourist destinations.

3.3.Questionnaire Reliability

The researcher used Cronbach's alpha to calculate the questionnaire's reliability; Table 1 displays the reliability coefficient values obtained using the "Cronbach's alpha" approach for the questionnaire's dimensions. By measuring the questionnaire's reliability using the Cronbach's alpha technique, it is obvious that it has a high degree of reliability, indicating its suitability for use in the current study as well as the credibility of the research results.

Table (1) Cronbach's Alpha Value

Variables	No. of items	Cronbach's Alpha	Validity Coefficient*
The role of Artificial intelligence in the Health tourism Establishments	**9**	**0.916**	**0.957**
The benefits of AI in Health tourism Establishments	**12**	**0.728**	**0.853**
Challenges facing the application of Artificial Intelligence techniques in the Egyptian Health Tourism Sector	**7**	**0.875**	**0.935**
The government Efforts to enhance role of AI in health tourism application at Egyptian tourist destination	**8**	**0.944**	**0.972**
Total	**36**	**0.907**	**0.952**

* Validity coefficient = $\sqrt{}$ Reliability coefficient

Cronbach's alpha was used to measure internal consistency and reliability. The reliability of the scales was examined, and Cronbach's alpha ranged from 0.728 to 0.944 for all scales in Table 1, as well as 0.907 for all questionnaire items, Cronbach's alpha values greater than 0.7 imply that each field has an adequate Cronbach's alpha value (Hof, 2012). It is also worth noting that the validity coefficient is 95.20 percent, indicating that the tested sample is dependable and genuine.

3.4. Data Analysis

In order to accomplish the objectives of the research, the researcher used statistical techniques like factor loading, Pearson correlation analyses, Cronbach's alpha test, mean and standard deviations (SD), and frequency distributions to process data using SPSS.

4. Results and Discussion

4.1. Descriptive Analysis of Research Variables

First Section: Respondent Demographic Characteristics

Table 2: Demographic profile of sample elements

Variable		Frequency	Percentage (%)
Gender			
	Male	**78**	**66.7**
	Female	**39**	**33.3**
age group			
	Up to 30 years old	**0**	**0**
	31-40 years old	**20**	**17.1**
	41-50 years old	**26**	**22.2**
	51-60 years old	**32**	**27.4**
	Over 60 years old	**39**	**33.3**
Educational level			
	Bachelor Degree	**0**	**0**
	Master Degree	**22.2**	**22.2**
	PhD degree	**77.8**	**77.8**
Professional Experience			
	Less than 3 Years	**0**	**0**
	From 3 to 6 Years	**13**	**11.1**
	From 7 to 10 Years	**26**	**22.2**
	More than 10 Years	**78**	**66.7**

As seen in Table 2, it is noticeable that around 66.7% of the study respondents are male. Around 33.3% of the respondents are over 60 years old. In addition, all respondents have a PhD degree (77.8%) or a master degree (22.2%). Moreover, most of the study respondents have professional experience spanning more than 10 years (66.7%).

Second Section: Study Related Data

Figure 2 depicts that 100 percent of respondents think the role of AI in the Egyptian health tourism sector is important and vital.

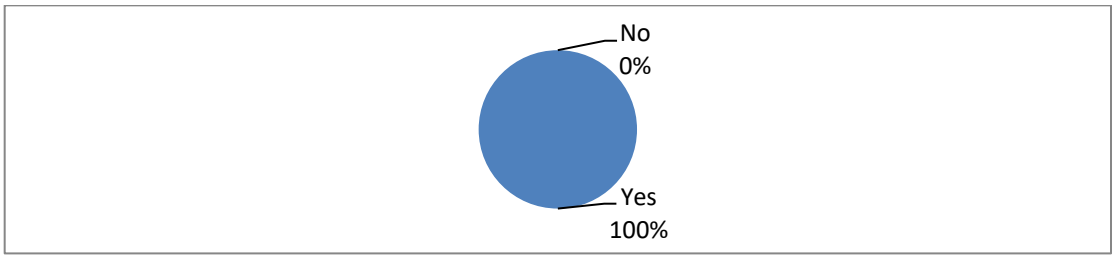

Fig2: The role of using AI in the Egyptian Health Tourism Sector.

The figure (3) depicts that 88.90% of respondents agree to activate medical centers and hospitals in Egypt that deal with medical tourism for AI to provide products and services to medical tourists in a professional manner.

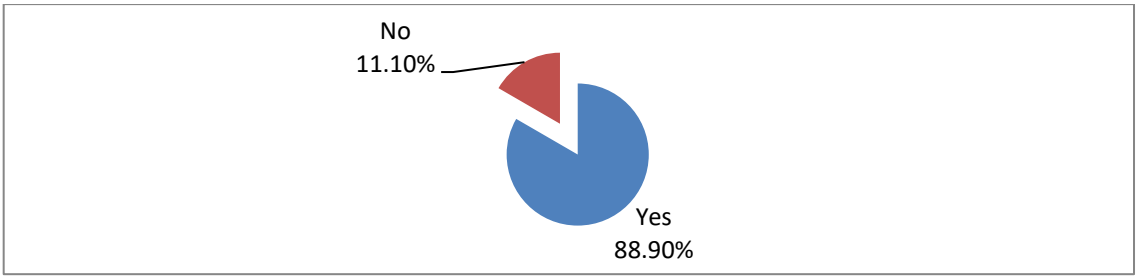

Fig3: Medical centers and Hospitals in Egypt that deal with Medical tourism enable for AI.

Third section: The role of Artificial intelligence in the Health tourism Establishments

Table 3: The role of Artificial intelligence in the Health tourism Establishments

Variables	Mean	SD	Factor loading	Rank	Attitude
Artificial intelligence (AI) helps in understanding the needs and wants of health tourists better.	**2.44**	**.688**	**.775**	**9**	**Agree**
Health Tourism Establishments have enhanced their interaction and communication with tourists.	**2.78**	**.418**	**.936**	**2**	**Agree**
AI will lead to a decrease in healthcare wait times.	**2.89**	**.316**	**.788**	1	**Agree**
AI assists medical tourists in making buying decisions and comparing different health tourism destinations in a simple and efficient manner.	**2.78**	**.499**	**.848**	**3**	**Agree**
AI in Health Tourism Facilities can enhance medical decision-making.	**2.67**	**.670**	**.925**	**6**	**Agree**
Using AI in Health Tourism Establishments might help enhance the supply of direct, easy-to-access health services.	**2.78**	**.631**	**.936**	**4**	**Agree**
The integration of AI in Egypt's medical tourism centers and hospitals enhances health tourism services and leadership development.	**2.67**	**.688**	**.782**	**7**	**Agree**
AI provides a competitive advantage for medical tourists to choose medical centers and hospitals in Egypt that engage with the medical tourism.	**2.67**	**.473**	**.782**	**5**	**Agree**
Applying AI in Egyptian medical centers and hospitals that deal with medical tourism would reduce mistake rates, enhance revenue, and boost client confidence.	**2.56**	**.499**	**.713**	**8**	**Agree**
Total Mean	**2.69**				**Agree**

It's declared from this table that respondents see the role of artificial intelligence in health tourism establishments, and the most common items are "AI will lead to a decrease in healthcare wait times" and "Health tourism establishments have enhanced their interaction and communication with tourists," with mean 2.89 and 2.78, respectively.

Fourth section: The benefits of AI in Health tourism Establishments

Table 4: The benefits of AI in Health tourism Establishments

Variables	Mean	SD	Factor loading	Rank	Attitude
AI could improve the operational efficiency of the Health tourism establishments and reduce the cost of medical care.	**2.56**	**.670**	**.807**	**10**	**Agree**
AI has the capability to enhance the Health tourism establishment's medical tourist's engagement and experience.	**2.78**	**.418**	**.980**	**4**	**Agree**
AI in Health tourism Facilities Could Improve Health Monitoring and Preventative Care.	**2.89**	**.316**	**.956**	**2**	**Agree**
AI could assist in bridging the data gaps in health tourism establishments.	**2.89**	**.318**	**.981**	**3**	**Agree**
Health Tourism Establishments use an AI tool to detect problems that occur during the application and processing stages.	**2.78**	**.460**	**.993**	**5**	**Agree**
The steps that have been taken to integrate AI into the Health Tourism Facilities provide ways to increase user trust in online transactions.	**2.78**	**.499**	**.993**	**6**	**Agree**
Virtual assistants and chatbots powered by artificial intelligence (AI) can make it easier for patients to access healthcare data and services.	**2.99**	**.111**	**0.997**	**1**	**Agree**
Artificial intelligence can also help with administrative tasks like scheduling meetings and handling insurance claims.	**2.78**	**.631**	**.749**	**7**	**Agree**
AI Applications Enhanced Service Quality and Reduced Medical Errors.	**2.56**	**.688**	**.936**	**11**	**Agree**
AI Applications Increase Productivity and Create New Jobs.	**2.33**	**.670**	**.740**	**12**	**Neutral**
AI Applications Improve Collaboration and Decision-Making.	**2.67**	**.473**	**.791**	**8**	**Agree**
AI applications improved the diagnosis and monitoring of patients.	**2.56**	**.499**	**.890**	**9**	**Agree**
Total Mean	**2.71**				**Agree**

The benefits of AI in health tourism establishments are shown in Table (4), with the means and standard deviations, with means ranging between 2.99 and 2.33. The item "Virtual assistants and chatbots powered by artificial intelligence (AI) can make it

easier for patients to access healthcare data and services." has a mean of 2.99 and a standard deviation of 0.111 when compared to the field's overall instrument means (2.71). The last-ranked response, "AI Applications Increase Productivity and Create New Jobs." had a mean (2.33) and a standard deviation of (0.670).

Fifth Section: Challenges facing the application of Artificial Intelligence techniques in the Egyptian Health Tourism Sector

Table 5: Challenges facing the application of Artificial Intelligence techniques in the Egyptian Health Tourism Sector

Variables	Mean	SD	Factor loading	Rank	Attitude
Medical tourism service providers lack a clear knowledge of how to apply AI in these technologies.	**2.33**	**.670**	**.946**	**6**	**Neutral**
Medical tourism service providers lack the competence required to develop in the use of artificial intelligence techniques.	**2.33**	**.820**	**.933**	**7**	**Neutral**
AI and how it should be regulated are concepts that managers and leaders don't fully understand.	**2.44**	**.840**	**.881**	**5**	**Agree**
Health tourism establishments lack the necessary infrastructure to accommodate AI technology.	**2.44**	**.688**	**.853**	**3**	**Agree**
There is ethics and privacy challenges in the Use of AI in Health tourism Facilities	**2.78**	**.631**	**.953**	**1**	**Agree**
The Lack of Consistency and Trust in the Use of AI Technologies at Health tourism Facilities.	**2.44**	**.835**	**.932**	**4**	**Agree**
AI-based health technology deployment is difficult and time-consuming.	**2.56**	**.499**	**.842**	**2**	**Agree**
Total Mean	**2.47**				**Agree**

It's declared from this table that respondents see challenges facing the application of artificial intelligence techniques in the Egyptian health tourism sector, and the most common items are: "There are ethics and privacy challenges in the use of AI in health tourism facilities" and "AI-based health technology deployment is difficult and time-consuming." and "Health tourism establishments lack the necessary infrastructure to accommodate AI technology." with mean 2.78, 2.56, and 2.44, respectively.

Sixth Section: The government Efforts to enhance role AI in health tourism application at Egyptian tourist destination

Table 6: The government Efforts to enhance role AI in health tourism application at Egyptian tourist destination

Variables	Mean	SD	Factor loading	Rank	Attitude
The government is investing resources and offering financial incentives to strengthen the digital infrastructure of healthcare organizations.	**2.67**	**.473**	**.775**	**2**	**Agree**
The government is standardizing digital infrastructure and data collection to enhance interoperability and facilitate the deployment of AI-powered health technologies across healthcare systems.	**2.78**	**.418**	**.928**	**1**	**Agree**
The government is developing high-quality, varied information to Health tourism Facilities AI-based health technologies.	**2.67**	**.670**	**.894**	**4**	**Agree**
The government is ensuring that HCPs are trained and equipped to embrace and apply AI-based health technology for decision assistance.	**2.67**	**.499**	**.808**	**3**	**Agree**
The government is promoting a culture of meaningful and useable innovation in the healthcare sector (for example, by establishing an innovation mandate for healthcare organizations).	**2.67**	**.673**	**.890**	**5**	**Agree**
The government is building trust and confidence in end-users.	**2.56**	**.499**	**.915**	**7**	**Agree**
The government is improving the system's ability and ability to adopt AI in the healthcare sector.	**2.67**	**.688**	**.890**	**6**	**Agree**
The government is enhancing the definition of AI governance in health, including assessment, reimbursement, regulation and standards.	**2.44**	**.688**	**.845**	**8**	**Agree**
Total Mean	**2.64**				**Agree**

The government's efforts to enhance the role AI in health tourism applications at Egyptian tourist destinations are shown in Table 6. It was discovered that the overall evaluation was agreed upon with a composite mean of 2.64. The government is standardizing digital infrastructure and data collection to enhance interoperability and facilitate the deployment of AI-powered health technologies across healthcare systems. It ranked first with a weighted mean score of 2.78 and was rated as agreeable. It was followed by the government investing resources and offering financial incentives to strengthen the digital infrastructure of healthcare organizations, with a weighted mean of 2.67. From the perspective of the researcher, the government is enhancing the definition of AI governance in health, including assessment, reimbursement, regulation, and standards, which ranked last with a weighted mean score of 2.44 and was rated agreeable with the lowest mean value.

4.2. Pearson Correlation analysis

Table 7: Correlation between government efforts to enhance the role of AI in health tourism applications at Egyptian tourist destinations and the role of AI in health tourism establishments

		The role of Artificial intelligence in the Health tourism Establishments
The government efforts to enhance the role of AI in health tourism applications at Egyptian tourist destinations	Pearson Correlation	**.741****
	Sig. (2-tailed).	**.000**

As shown in Table 7, there is a strong and positive correlation between government efforts to improve the role of AI in health tourism applications at Egyptian tourist destinations and the role of artificial intelligence in health tourism establishments. The value of the Pearson correlation coefficient is (.741**-sig = 0.000).

Table 8: Correlation between the government efforts to enhance the role of AI in health tourism applications at Egyptian tourist destinations and the benefits of AI in health tourism establishments

		The benefits of AI in Health tourism Establishments
The government Efforts to enhance role AI in health tourism application at Egyptian tourist destination	Pearson Correlation	**.866***
	Sig. (2-tailed).	**.000**

As shown in Table 8, the correlation between the government's efforts to improve the role of AI in the application of health tourism at Egyptian tourist destinations and the benefits of AI in health tourism establishments is very high. The correlation value of the Pearson correlation coefficient is (.866** - sig = 0.000).

Table 9: Correlation between government efforts to enhance the role AI in health tourism applications at Egyptian tourist destinations and challenges facing the application of AI techniques in the Egyptian health tourism sector

		Challenges facing the application of Artificial Intelligence techniques in the Egyptian Health Tourism Sector
The government Efforts to enhance role AI in health tourism application at Egyptian tourist destination	Pearson Correlation	**.946****
	Sig. (2-tailed).	**.000**

As shown in Table 9, the correlation between the government's efforts to improve the role of AI in health tourism applications at the tourist destination and the challenges faced by the application of AI in the health tourism sector in Egypt is very high. The correlation value of the Pearson correlation coefficient is (.946**-sig = 0.000).

5. Summary and Conclusion

This research aims mainly to explore the utilization of AI as a new trend to strengthen health tourism applications in Egyptian tourist destinations. Hence, the research got the following results: As technology and artificial intelligence applications have advanced, health tourism has taken on a new dimension. Health tourists can gain access to health institutions that provide more affordable, shorter wait times, and higher-quality services outside of their own communities. Countries' shifting attitudes towards health tourism have resulted in the growth of the industry and its transformation into an economic resource. Countries that invest in technology provide patients with knowledge on what constitutes quality health care.

According to the research findings, artificial intelligence applications play an essential role. AI will reduce healthcare wait times, and health tourism organizations have improved their connection and communication with visitors. One of the most significant advantages of AI applications is that virtual assistants and chatbots powered by AI may improve patients' access to healthcare data and services. The most significant difficulties in the implementation of artificial intelligence technology in Egypt's health tourism business are ethical and privacy concerns. One of the most important attempts by the government to improve the role of AI in health tourism applications at Egyptian tourist locations is to spend resources and provide financial incentives to healthcare organizations to expand their digital infrastructure.

6. Recommendations

In the area of AI and health, the government should establish and vigorously enforce laws and regulations, launch the first AI policy (the Egypt Artificial Intelligence Strategy), encourage public-private partnerships, support companies investing in AI, create policies addressing privacy and confidentiality issues in AI-driven healthcare, and establish a certification programme for AI-based healthcare solutions. Before introducing AI-based healthcare, it is essential to teach the workforce about AI so they can safely manage patient data that is secret, stop data theft, and effectively use AI systems. Making sense and being able to explain healthcare decisions made using AI technology is also crucial.

The Ministry of Tourism and Antiquities should prepare a strategy to develop the hospital tourism product in a scientific and thoughtful manner that contributes to achieving the target of this product and making it a product that can compete globally. It also appreciated all the efforts made and successful initiatives and projects related to hospital tourism.

The Ministry of Health and Population should coordinate with hospitals and health care providers, establish alliances with the private and public sectors, and be accredited locally and internationally by all institutions to support health tourism using artificial intelligence applications. Promote the rehabilitation of medical facilities and places that serve health tourism based on artificial intelligence applications to deal with cases of people with special needs.

7. Implications of AI Applications in Health Tourism

Firstly, it is necessary to create a legal framework for accessing and sharing information for AI applications. In order to improve AI performance in healthcare,

real-time data collection and sharing are necessary. The quality of the data is crucial because “the higher the quality of the data, the greater the user’s confidence in the outputs, reducing the risk in the results and increasing the efficiency." **Secondly**, societal agreement is required on crucial AI issues, including responsibility, data sharing, and secrecy. In order to obtain data—which is the primary resource for medical AI—public involvement has to be promoted. **Thirdly**, the use of AI-driven systems necessitates the engagement of experts in several areas of care service. **Finally**, rather than focusing entirely on the job-destroying potential of AI systems, efforts should be made to maximize spare personnel in new areas of value generation.

References

1. Ahmadi, M., Peyravi, M., & Shaygani, F. (2022). "A revolution in health: Opportunities and challenges of the Metaverse", *Excli Journal*, 21, 791-792.
2. AccuVein, V. (2024). "AccuVein Vein Visualization: The Future of Healthcare is here", available online at https://www.accuvein.Com/Why-Accuvein/Ar/, Erişim Tarihi, (accessed on: 14 January 2024).
3. Allen, S. (2019). “2019 global health care outlook”, available online at: https:// www.deloitte.com/global/en/pages/lifesciences- and-healthcare/articles/global-health-care-sector-outlook.html (accessed 25 January 2024).
4. Aydoğmuş, U., Aykın, Ö. (2020). "Digital Marketing and the New Face of the Consumer", Current Studies in Marketing, İksad Publishing House.
5. Aykın, Ö. (2020). "Health Tourism Marketing on the Axis of Relationship Marketing", Theory and Research in Economics and Administrative Sciences, Gece Library Akademi. ISBN: 978-625-7243-51-3.
6. Bajpai, N., John, B., and Ye Yip, Y. (2020). “National ICT-Driven Development Policy Comparing Approaches in India and China.” Working Paper 2. CSD Working Paper Series: Towards a New Indian Model of Information and Communications Technology-Led Growth and Development. Center for Sustainable Development, Earth Institute, Columbia University.
7. Barnes, S. (2016). "Understanding virtual reality in marketing: nature, implications and potential: implications and potential", Available online at: https:// www.ssrn.com/abstract=2909100 (accessed 3 February 2024).
8. Bhattacharyya, S.M. (2020), “Medical tourism: role of telemedicine”, available online at: https:// www.asianhhm.com/ healthcare-management/medical-tourism-telemedicine (accessed 13 March 2024).
9. Bowyer, K.W. (2004). "Face recognition technology: security versus privacy", *IEEE Technology and Society Magazine*, Vol. 23 No. 1, pp. 9-19.
10. Brougham, D., & Haar, J. (2017). "Smart Technology, Artificial Intelligence, Robotics, and Algorithms (STARA): Employees’ perceptions of our future workplace", *Journal of Management & Organization*, 24(2), 239-257.
11. Collis, J., & Hussey, R. (2014). "Business Research: A Practical Guide for Undergraduate and Postgraduate Students", Fourth edition, Jill Collis & Roger Hussey. ed., Basingstoke: Palgrave Macmillan.
12. Deniz, E., Doğan, O., & Köse, G. (2023). "The Potential of Reality Applications for Experiential Marketing in Health Tourism", Ahi Evran III- International Conference on Scientific Research May 3-4, 2023 / Full Textsbook, 288 – 298.
13. Gan, L., & Frederick, R. (2011). "Medical tourism facilitators: Patterns of service differentiation", *Journal of Vacation Marketing*, 17(3), 165–183.

14. Ghassemi, M., Nejad, G., & Aghaei, I. (2020). "Knowledge management orientation and operational performance relationship in medical tourism (overview of the model performance in the COVID-19 pandemic and post-pandemic era)", *Health Serv. Manag. Res*., 1–15.
15. Gupta, K., and Rashmi, K. (2018). "Artificial Intelligence in Public Health: Opportunities and Challenges", *JK Science*, 19(4).
16. Hassan, V., & Bellos, G. (2022). "COVID-19: Reshaping Medical Tourism through Artificial Intelligence (AI) and Robotics", *Athens Journal of Tourism*. 9. 77-98.
17. Herrick, DM. (2007). "Medical tourism: global competition in health care". NCPA Policy Reports.
18. Hof, M. (2012). "Questionnaire evaluation with factor analysis and Cronbach's alpha: An example".
19. Hong, A. (2016), "Vision 2.0 medical tourism and telemedicine: a new frontier of an old business", *Journal of Medical Internet Research*, Vol. 18 No. 5, p. 115.
20. Horne, B., Nevo, D., Adali, S., Manikonda, L., & Arrington, C. (2020) "Tailoring heuristics and timing AI interventions for supporting news veracity assessments", *Computers in Human Behavior Reports*, 3, 1-16.
21. Iryo.network (2018). "Medical tourism will benefit from telemedicine and blockchain", available online at: https://www.medium.com/iryo-network/medical-tourism-will-benefit-fro m-telemedicine-and-blockchain-f0d15a82fc18 (accessed 10 March 2024).
22. Ivanov, St., & Webster, Cr. (2019). "Economic fundamentals of the use of robots, artificial intelligence, and service automation in travel, tourism, and hospitality". *Emerald Insight, Discover Journals, Books & Case Studies.*
23. Kavut, S. (2022). "Examination of Theses Written in the Field of Artificial Intelligence in Turkey Using Content Analysis Method", *Turkish Journal of Communication Research*, (41), 80-98.
24. Koo, B., Curtis, C., & Ryan, B. (2021). "Examining the Impact of Artificial Intelligence on Hotel Employees through Job Insecurity Perspectives", *International Journal of Hospitality Management*, 95.
25. Li, B., Dong, Q., Downen, R., Tran, N., Jackson, J., Pillai, D., & Li, Z. (201 9). "A wearable IoT aldehyde sensor for pediatric asthma research and management", *Sensors and Actuators,* 287, 584-594.
26. Li, J., Bonn, M. A., & Ye, B. H. (2019). "Hotel Employee's Artificial Intelligence and Robotics Awareness and Its Impact on Turnover Intention: The Moderating Roles of Perceived Organizational Support and Competitive Psychological", *Climate Tourism Management*, 73, 172-181.
27. Lobo, F. (2020). "Industry 4.0 – manufacturing and the future of medical things", available online at: https://www. asianhhm.com/technology-equipment/industry-manufacturing-future-medical-things (accessed 13 March 2024).
28. Luxton, D. (2016). "An introduction to artificial intelligence in behavioral and mental health care, chapter 1", in Luxton, D.D. (Ed.), *Artificial Intelligence in Behavioral and Mental Health Care*, Academic Press, MA, 1-26.
29. Malhotra, N., and Saransh, R. (2019). "National Artificial Intelligence Mission." available online at: https://www.investindia.gov.in/team-india-blogs/national-artificial-intelligence-mission (accessed 13 March 2024).
30. Medical Technology (2020), "Medical tourism: how is digital tech reshaping the industry?" available online at: https://medical-technology.nridigital.com/medical_technology_jan20/medical_tourism_how_is_di gital_ tech_reshaping_the_industry (accessed 20 March 2024).

31. Mohamed, K., Salman, O., Elhenawy, I. (2020) "Utilizing the New Technologies For Enhancing Healthcare Tourism in Egypt", *International Journal of Innovative Science and Research Technology*, Vol. 5, No.8.
32. Park, S. (2020), "Multifaceted trust in tourism service robots", *Annals of Tourism Research*, Vol. 81.
33. Paul, Y., Elonnai, H., Amber, S., Udbhav, T., & Pranav, B. (2018). "Artificial Intelligence in the Healthcare Industry in India", available online at: https://cis-india.org/internet-governance/files/ai-and-healtchare-report (accessed 20 March 2024).
34. Perry, P. (2016), "'How Artificial Intelligence will Revolutionize Healthcare", Big Think, available online at: https://bigthink.com/philip-perry/how-artificial-intelligence-will-revolutionize-healthcare (accessed 30 Mar 2024).
35. Peyman, R-H., Reza, S., Marjan, G., & Taha, S. (2017). "The Applications of Health Informatics in Medical Tourism Industry of Iran", *Iran J Public Health, Vol. 46, No.8, pp.1147-1148*.
36. Raghupathi, W., and Viju R. (2014). "Big Data Analytics in Healthcare: Promise and Potential." *Health Information Science and Systems* 2 (3).
37. Russell, S.J. and Norvig, P. (2016). "Artificial Intelligence: A Modern Approach", Pearson Education Limited, Malaysia.
38. Sevim, E., & Sevim, E. (2019). "Examining the factors affecting medical tourism preference: Türkiye example", *Hacettepe Journal of Health Administration*, 22(3).
39. Seyito_glu, F. and Ivanov, S. (2021), "Service robots as a tool for physical distancing in tourism", Current Issues in Tourism, Vol. 24 No. 12, pp. 1631-1634.
40. Sharda N (2009). Tourism Informatics: Visual Travel Recommender Systems, Social Communities, and User Interface Design. ed. Information Science Reference.
41. Thomason, J. (2021). "MetaHealth-How will the Metaverse Change Health Care?" *Journal of Metaverse*, 1(1), 13-16.
42. Trost, Z., France, C., Anam, M., Shum, C. (2021). "Virtual Reality Approaches To Pain: Toward A State of the Science. Pain". 162(2), 325-331.
43. Tussyadiah, I. (2020), "A review of research into automation in tourism: launching the annals of tourism research curated collection on artificial intelligence and robotics in tourism", Annals of Tourism Research, Vol. 81.
44. Tussyadiah, I.P., Zach, F.J. and Wang, J. (2020), "Do travelers trust intelligent service robots?", Annals of Tourism Research, Vol. 81.
45. Valeri, M., & Baggio, R. (2020). "A critical reflection on the adoption of blockchain in tourism", *Journal Information Technology and Tourism*, 23(2), 121–132.
46. Viziteu, L. (2008). "Horizons and Perspectives eHealth". Analele Universitatii din Craiova-Seria Stiinte Economice.
47. Wong, B., & Hazley S. (2020). "The future of health tourism in the industrial revolution 4.0 era", *Journal of Tourism Futures*, 7(2). 267-272.
48. World Tourism Organization and European Travel Commission, (2018). *Exploring Health Tourism*, Madrid: UNWTO.
49. Yıldız, E. (2021). "Examination of Theses on Artificial Intelligence in the Field of Communication", *Istanbul Aydin University Journal of Social Sciences*, 13(3).
50. Yılmaz, F., Mete, A.H., Fidan Türkön, B., & İnce, Ö. (2022). "Metaverse Ecosystem and Technologies in the Future of Healthcare: Applications, Opportunities, and Challenges", *Eurasian Journal of Health Technology Assessment*, 6(1):12.

المحتوى متاح على بنك المعرفة المصري EKB

مجلة المنيا لبحوث السياحة والضيافة

رابط المجلة https://mjthr.journals.ekb.eg/

دور الذكاء الاصطناعي في تعزيز تطبيقات السياحة الصحية في الوجهات السياحية المصرية

أ. م . د / حسين عبدالوهاب عبدالراضي

أستاذ مساعد – قسم الدراسات السياحية – كلية السياحة والفنادق – جامعة المنيا

الكلمات الدالة

الذكاء الاصطناعي، السياحة العلاجية، التطبيقات، الوجهات السياحية، مصر.

المستخلص

في الوقت الحاضر، توفر التكنولوجيا المتقدمة العديد من الفوائد. وتمثل التكنولوجيا أهمية بالغة من حيث الوقت والتكلفة وسهولة الوصول إلى المعلومات، وخاصة في تعزيز تطبيقات السياحة الصحية في المقصد السياحي المصري، باعتبار الخدمات السياحة الصحية مقدمة في جميع أنحاء العالم؛ فضلا عن أن القدرة على محاكاة العقل البشري تجعلنا نضع تطبيقات الذكاء الاصطناعي بطريقة جديدة تمامًا. فالذكاء الاصطناعي يساعد في تحقيق نتائج أكثر تركيزا في العديد من المجالات ومن أهمها الرعاية الطبية، وخاصة من خلال تحليل الفوائد. يناقش هذا البحث أهم الإمكانيات والعقبات المرتبطة بتطبيق الذكاء الاصطناعي على السياحة الصحية، ويهدف البحث إلى دراسة استخدام الذكاء الاصطناعي كاتجاه جديد لتعزيز تطبيقات السياحة الصحية في الوجهات السياحية المصرية. واعتمدت منهجية الدراسة على التحليل الوصفي باستخدام الاستبيان الإلكتروني، وتم استخدام عدة طرق إحصائية في الدراسة. تظهر النتائج أن الحكومة تعمل على توحيد البنية التحتية الرقمية وجمع البيانات من أجل تحسين قابلية التشغيل البيني وتبسيط تنفيذ الخدمات الصحية المدعومة بالذكاء الاصطناعي عبر أنظمة الرعاية الصحية. وتوصي هذه الدراسة الحكومة بتنفيذ أول استراتيجية للذكاء الاصطناعي، وهي استراتيجية مصر للذكاء الاصطناعي، وتشجيع الشركات على الاستثمار في الذكاء الاصطناعي، وتعزيز التعاون بين القطاعين العام والخاص في مجالات الذكاء الاصطناعي والصحة. ومن الضروري توفير منصات افتراضية لتنسيق خدمات الرعاية الصحية قبل وأثناء وبعد الحصول عليها، مما يتيح للعملاء الحصول على تجربة كاملة، بما في ذلك الاستفسارات الأولية، والتنسيق مع مقدمي الخدمة، والمتابعة بعد تلقي الخدمة، كذلك كدمج الممارسات المستدامة والصديقة للبيئة في السياحة العلاجية.