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Identifying the Factors Influencing the Impact of Artificial Intelligence on Optimizing the Attraction of Sports Tourists with a Health-Oriented Approach

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Abstract

This study aimed to identify the factors influencing AI's role in attracting health-oriented sports tourists in Iran. Employing a qualitative exploratory design grounded in the interpretive-constructivist paradigm, data were collected through in-depth, semi-structured interviews with 15 purposively selected participants from three key stakeholder groups: health-oriented sports tourists, industry practitioners and experts and academic researchers and specialists in the field of artificial intelligence in tourism. The interview data were analyzed using Braun and Clarke's reflexive thematic analysis approach, adhering to the six-phase framework. The trustworthiness of the findings was ensured through Lincoln and Guba's four criteria of credibility, transferability, dependability, and confirmability. The analysis yielded a comprehensive hierarchical thematic structure comprising 42 basic themes, 12 subordinate themes, and 4 overarching main themes: (1) Technological Core: AI-Enabled Hyper-Personalization of the Health-Oriented Sports Tourism Experience; (2) Ethical-Cultural Governance: Culturally Intelligent, Trustworthy, and Responsible AI; (3) Systemic Impediments: A Multi-Layered Ecosystem of Barriers to AI Adoption; and (4) Strategic Roadmap for Implementation: Integrated Governance, Investment, and Collaborative Action. The findings reveal that while AI holds substantial transformative potential for delivering deeply personalized, data-driven health and fitness experiences, its successful implementation in the Iranian context is critically contingent upon embedding cultural intelligence, transparency, and user trust into the very design of AI systems, and systematically addressing a deeply interconnected ecosystem of legal, financial, technical, and socio-cultural barriers. The study concludes with a pragmatic, pilot-driven strategic roadmap and offers actionable recommendations for policymakers, industry practitioners, and academic institutions.

Keywords: Artificial Intelligence, Health-Oriented Approach, Sports Tourism, Thematic Analysis.

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Introduction

In recent years, the tourism industry, as one of the world's most vital economic and cultural sectors, has undergone profound structural and functional transformations driven by the rapid evolution of digital technologies. Technological advancements, particularly in the field of artificial intelligence (AI), are redefining how tourists interact with travel experiences, destination services, and marketing processes (López-Naranjo et al., 2025). With capabilities such as big data analytics, machine learning, and natural language processing, AI has become a strategic tool for personalizing services, predicting tourist behavior, and optimizing decision-making processes within this industry (Bulchand-Gidumal, 2020; Florido-Benítez & del Alcázar Martínez, 2024; Ghanbari et al., 2025).

In this context, sports tourism, as one of the most dynamic and complex forms of tourism, is playing an increasingly significant role in responding to the emerging needs of tourists; needs that go beyond mere leisure to encompass the enhancement of physical and mental health and quality of life (Weed & Bull, 2012). Concurrent with the growth of sports tourism, health-oriented tourism has also come into focus as a part of experience-based tourism. This type of tourism encompasses travel whose primary purpose is to improve the physical, mental or well-being status of tourists and is deeply linked with the development of preventive and experiential health approaches (Lukose et al., 2024; Gan et al., 2023). This evolution has led to the formation of the "health-oriented sports tourism" concept, a construct situated at the intersection of sports, health, and the travel experience, which requires innovative, data-driven, and personalized approaches (Smith, 2019). Within this ecosystem, the application of AI can create unique opportunities for optimizing the attraction of sports tourists with a health-oriented approach. AI technologies are capable of analyzing tourist behavior, delivering personalized recommendations tailored to their physical and psychological conditions, and dynamically adjusting the marketing performance of destinations (López-Naranjo et al., 2025; Dai et al., 2024). This not only enhances marketing efficiency but also leads to improved health-oriented experiences and the overall performance of the sports tourism industry (Šakyte-Statnicke & Budryte-Ausiejiene, 2025).

Despite the growing importance of this field, a systematic review of the literature reveals significant gaps in the scientific discourse. In domestic research, although numerous studies have addressed the application of AI in tourism, they have often been either general in scope or focused on isolated domains. For instance, a group of studies has referred to smart tourism in the sports industry and identified its general factors, including AI (Salahi Kojour et al., 2020; Salahi Kojour et al., 2021). Another category has exclusively examined AI applications in health tourism without considering its sports dimension (Forghani, 2024; Jamaat et al., 2024; Yousefi et al., 2025) or has emphasized its impact on the marketing and branding of health destinations (Salehi & Bidram, 2024; Nateghian & Salimi Nejad, 2024). In the sports domain, studies have primarily concentrated on sports marketing and athlete performance (Momeni Far et al., 2024; Rahmani et al., 2024) and have rarely addressed its connection with health-oriented tourism. Collectively, these studies, while valuable in their respective domains, remain fragmented, operating in disciplinary silos without offering an integrative lens that simultaneously captures the technological, health, and sports dimensions of AI-driven tourist attraction. The strength of these studies lies in explaining the general capacities of digital technologies and AI and highlighting benefits such as service personalization and enhanced customer experience (Hosseini & Hosseini, 2024; Kiani & Nazari, 2025). However, their common weakness is the lack of an integrated framework for identifying the specific factors influencing tourist attraction at the intersection of the three domains: sports tourism, health orientation, and AI.

A similar situation is observed in international research. Many studies have broadly examined the diverse applications of AI in travel and tourism (Bulchand-Gidumal, 2020; Stojanovic et al., 2025) or investigated its impact on management, marketing, and customer engagement within the sports industry (Efe, 2023; Jokela, 2024). Another set of studies has focused on the motivations and perceptions of health and wellness tourists (Gan et al., 2023; Dai et al., 2024). Although this body of research possesses notable strengths, such as the presentation of empirical data and an emphasis on the competitive advantages of AI (Al-Orainat, 2025; Memon et al., 2025), their primary weakness is a sectoral focus and a failure to provide a holistic analysis of the role of AI in optimizing the attraction of sports tourists with a health-oriented approach. Even the few studies that have addressed sports tourism and AI (Lu, 2022) have overlooked the health-oriented dimensions. Consequently, the existing literature remains fragmented, offering no integrated, context-sensitive framework that simultaneously accounts for the technological capabilities of AI, the specific demands of health-oriented sports tourism, and the unique socio-cultural and regulatory context of Iran. This study, therefore, moves beyond merely identifying general AI applications by providing a localized, multi-dimensional model that explicitly incorporates Iran-specific cultural and religious sensitivities, systemic legal and infrastructural barriers, and a pragmatic, stakeholder-driven implementation roadmap—none of which have been systematically addressed in prior research.

Therefore, the main research gap that this study seeks to fill is the absence of a comprehensive and systematic model for identifying and analyzing the factors influencing AI's role in attracting health-oriented sports tourists—factors that span technological capabilities, cultural and ethical considerations, systemic barriers, and strategic enablers unique to the Iranian context. The core issue is that despite the increasing demand for experience-based and health-conscious travel, especially following global crises (Wang et al., 2025), and the concurrent rapid growth of AI technologies, a clear understanding of which factors and through what mechanisms can be effective in this synergy is still lacking. The significance and necessity of this research can be articulated from both a scientific and a managerial perspective. From a scientific standpoint, this study makes a distinct contribution to the literature by developing a novel, contextually grounded conceptual model that, for the first time, integrates the three fragmented domains of sports tourism, health tourism, and artificial intelligence within the specific socio-cultural and regulatory landscape of Iran. Unlike prior studies that have examined these areas in isolation, this research identifies and systematically categorizes 42 context-specific factors, including culturally embedded components—such as adherence to the Hijri calendar, halal dietary requirements, gender-segregated service preferences, and culturally congruent communication protocols—that have not been previously theorized in the AI-tourism nexus. Furthermore, it uncovers a unique, self-reinforcing ecosystem of systemic barriers specific to Iran—namely, the absence of a comprehensive data protection law, persistent inter-organizational conflict among key ministries, economic sanctions limiting technology access, and deep-rooted public mistrust stemming from socio-political experiences—that collectively distinguish the Iranian context from the settings examined in the existing international literature. Finally, the study goes beyond mere diagnosis by proposing a pragmatic, pilot-driven strategic implementation roadmap grounded in multi-stakeholder collaboration, thereby transforming the identified barriers into an actionable agenda. Through these contributions, the research not only fills a critical gap but also offers a transferable analytical framework that can inform similar studies in other developing countries with comparable cultural and regulatory complexities. From a managerial and practical perspective, considering the economic and social importance of sports and health tourism in Iran (UNWTO, 2020; Allami, 2025) and its capacities for job creation and foreign currency earnings (Bashokooh & Forouzan, 2025), the results of this study can serve as a practical guide for policymakers, marketing managers, and industry practitioners. It can enable them to purposefully leverage AI technologies to deliver a personalized, engaging, and health-oriented experience for tourists, thereby establishing a sustainable competitive advantage for sports tourism destinations. Finally, in light of the foregoing, the main research question is formulated as follows: What are the technological, cultural, ethical, systemic, and strategic factors influencing AI's role in attracting health-oriented sports tourists in Iran?

Research Methods

The present study is applied in terms of its purpose, as its findings can be directly utilized to enhance the impact of artificial intelligence on optimizing the attraction of sports tourists with a health-oriented approach in Iran. Regarding its nature and philosophical stance, the research falls within the category of interpretivist inquiry, which is grounded in the interpretive-constructivist paradigm. Within this paradigm, reality is considered subjective, multi-layered, and contingent upon social context and setting, and the aim of the research is to attain a deep understanding of the meanings, experiences, and interpretations that participants ascribe to the phenomenon under investigation (Creswell & Poth, 2018). In terms of research logic and approach, this study follows an inductive approach, meaning that concepts, themes, and patterns have been derived directly from the field data, and the researcher entered the analytical process without predetermined theoretical presuppositions (Stebbins, 2001). With respect to strategy, the study is a qualitative exploratory inquiry, employing thematic analysis with the thematic networks approach (Attride-Stirling, 2001). This strategy is particularly suited to research that seeks to discover latent patterns, identify recurring themes, and organize findings across different levels of meaning (Braun & Clarke, 2006). From a temporal perspective, this research constitutes a cross-sectional study, as the data were collected within a specific timeframe (the second half of 2025) and capture the status of the use and application of artificial intelligence in attracting sports tourists with a health-oriented approach in Iran at a particular point in time. The data collection sources comprise two components: (a) library-based studies and a systematic review of the theoretical and empirical literature related to sports management, sports tourism management, and artificial intelligence and its application in sports; and (b) field data obtained from in-depth, semi-structured interviews. The data collection instrument consisted of in-depth, semi-structured interviews, which allow for flexibility in follow-up questions and access to deeper layers of participants' experiences (Rubin & Rubin, 2012). Accordingly, this research seeks to identify the factors influencing the impact of artificial intelligence on optimizing the attraction of sports tourists with a health-oriented approach in Iran.

The present study involved 15 participants who fell into three distinct categories: (1) health-oriented sports tourists who had travel experience in this domain; (2) practitioners and experts in the sports and health-oriented tourism industry (including those working in hotels, travel agencies, medical centers, and sports clubs); and (3) researchers and specialists in the field of artificial intelligence in tourism. Participants were initially recruited through purposive sampling, whereby individuals who met the predefined inclusion criteria and were deemed capable of providing rich, relevant, and diverse insights into the research phenomenon were deliberately identified and invited. The initial recruitment was facilitated through multiple channels: professional networks and referrals within the tourism and sports industries, academic research groups and scientific associations specializing in AI and tourism, and direct outreach to individuals with publicly documented experience in health-oriented sports travel. Following this initial purposive phase, theoretical sampling was employed as the study progressed, meaning that subsequent participant selection was guided by the emerging conceptual categories and the need to elaborate, refine, and saturate specific dimensions of the developing thematic structure (Asefi, 2025). In practice, this involved, for example, recruiting an additional participant with a specialized background in ethics and technology (P15) after preliminary analysis highlighted the salience of ethical concerns, and seeking out a policy-oriented expert (P13) to deepen the understanding of legal and regulatory barriers that were repeatedly raised by earlier interviewees. The inclusion criteria for the study were as follows: Based on Participant Groups: Group One: Health-Oriented Sports Tourists: Having undertaken at least one sports tourism trip with the primary motivation of improving physical or mental health within the last three years. Familiarity with and use of at least one technology-based tool or platform during various stages of their travel (such as booking applications, recommender systems, or health trackers). Group Two: Industry Practitioners and Experts: Having a minimum of three years of executive or managerial work experience in one of the relevant sectors, including sports tourism, health tourism, sports clubs, hotels, or specialized travel agencies. Having practical experience with or knowledge of utilizing digital tools and emerging technologies in the processes of attracting tourists and delivering services to them. Group Three: Researchers and Specialists in the Field of Artificial Intelligence: Holding a Master's or Doctoral degree in disciplines related to artificial intelligence, data science, information technology, or tourism management with a technology focus. Having a documented research or professional background in the application of artificial intelligence within the tourism or sports industry. A total of 21 individuals were initially invited to participate in the study. Of these, 4 did not respond to the invitation, and 2 declined to participate—one citing time constraints and the other expressing concerns regarding confidentiality. Consequently, 15 individuals ultimately consented to participate and completed the interview process, yielding a response rate of approximately 71%. All participants provided full informed consent prior to the commencement of their interviews.

All interviews were conducted individually and online via WhatsApp, domestic messaging applications, and social media platforms (owing to the geographical and temporal constraints of certain participants) and were scheduled at times chosen by the interviewees. To record the data, audio recording of the conversations was employed with the explicit consent of the participants. In this study, the interview process continued until data adequacy was achieved (Guest et al., 2006). Specifically, after conducting 12 interviews, the researcher systematically reviewed the emerging codes and themes and determined that no substantially new basic themes were being generated from the later interviews. To substantiate this claim, a comparative analysis was undertaken: the final three interviews (P13, P14, P15) yielded no additional distinct basic themes beyond those already identified in the first 12 interviews. For instance, the theme of "Public Distrust of Algorithms and Data Misuse Concerns" (M23), which had been extensively articulated by earlier participants, was echoed almost verbatim by P13, who stated, "Until we specify which minister is responsible...," and by P14, who emphasized the fear of surveillance. Similarly, the theme "Respect for Religious Sensitivities and Calendars" (M18), which had saturated by the tenth interview, was merely reiterated—not expanded—by P15, who reinforced the importance of "dynamic informed consent" for religious reminders without introducing a conceptually new dimension. The themes "Unstable and Low-Speed Internet Infrastructure" (M25) and "High Costs of Hardware, Software, and Implementation" (M27) also reached a point of conceptual redundancy, with no novel sub-categories emerging after the eleventh interview. Consequently, interviews 13 through 15 served primarily to confirm and reinforce the robustness of the existing thematic structure rather than to introduce new conceptual categories, thereby providing additional assurance that data adequacy had been attained. To maintain confidentiality, the interviewees were designated with codes ranging from P1 to P15. Furthermore, the main interview questions comprised the following: 1) Please introduce yourself and your professional background related to tourism, sports, health, or technology, 2) In your view, how is health-oriented sports tourism defined, and what characteristics distinguish it from other types of tourism? 3) In your opinion, which artificial intelligence technologies (e.g.,

chatbots, recommender systems, sentiment analysis, and computer vision) can have the greatest impact on attracting and retaining health-oriented sports tourists? Why? 4) Have you encountered any examples of successful AI application in this field in Iran or globally? Please elaborate, 5) How can artificial intelligence create a personalized experience for tourists? (e.g., in designing exercise programs, dietary plans, destination recommendations), 6) In your view, how might the use of artificial intelligence influence tourists' cultural behaviors or preferences? (e.g., in destination selection, interaction with the host community), 7) Can artificial intelligence technologies identify and respect the cultural or religious sensitivities of health-oriented tourists? If so, how? 8) What are the most significant cultural or social challenges in deploying artificial intelligence to attract health-oriented sports tourists in Iran? 9) Which countries do you consider pioneers in using artificial intelligence for sports-health tourism? What lessons can be learned from them? 10) What components do successful global models possess? Can these models be transferred to Iran? What adaptations are necessary? 11) What are the greatest barriers to implementing artificial intelligence in Iran's health-oriented sports tourism industry? (Technical, financial, cultural, legal), 12) What measures are essential to build tourists' trust in artificial intelligence systems? 13) From your perspective, what are the key strategies for facilitating the implementation of artificial intelligence in this domain? (The role of government, the private sector, universities), 14) If you had one key recommendation for policymakers or investors in this field, what would it be? And 15) Is there any other point you would like to mention? These interview questions are adequate and appropriate for achieving the objectives of the research.

In order to ensure the quality and trustworthiness of the findings, the four criteria established by Lincoln and Guba—namely credibility, transferability, dependability, and confirmability—were employed (Lincoln & Guba, 1985). To enhance the credibility and dependability of the data, strategies such as prolonged engagement of the researcher with the research setting, persistent interaction with participants, and member checking were utilized. Specifically, a portion of the transcribed texts and initial codes was sent to several participants (five individuals) so that they could provide their feedback on the accuracy of the researcher's interpretations and inferences; these member checks resulted in the confirmation of the interpretive content. Furthermore, to enhance confirmability, theoretical validation was employed, whereby the extracted themes were compared with the theoretical literature and previous studies in order to examine the degree of alignment and coherence between the researcher's interpretations and the existing body of knowledge. Given that independent and differing data sources were not utilized in this study, the term triangulation has not been applied; rather, the method of theoretical comparison was solely employed as a validation strategy. To increase dependability, the data analysis process was documented in a systematic, step-by-step manner, and a portion of the coding was repeated by the researcher at two separate time intervals. Additionally, to assess the reliability of the coding, 20 percent of the total codes were reviewed by an independent coder, and the degree of agreement between the two coders was calculated using Cohen's Kappa coefficient. The obtained Kappa value of 0.87 indicates a highly satisfactory and near-excellent level of agreement between the evaluators.

The method of data analysis in this study was reflexive thematic analysis based on the six-phase approach of Braun and Clarke (2006; 2021). In this method, the researcher is recognized as the primary instrument of analysis and plays an active and reflexive role in the process of theme extraction. The six phases were carried out in the following order: Phase One: Familiarization with the Data: Initially, all interviews were read and reread carefully several times. During this phase, through immersion in the data, the researcher recorded initial notes regarding preliminary patterns and points of interest. Phase Two: Generating Initial Codes: In this phase, meaningful segments of the interview transcripts were systematically identified and labeled. The codes encompassed both the semantic (explicit) content and the latent (underlying) meanings within the data. Coding was conducted line by line, employing an inductive approach. Phase Three: Searching for Themes: Codes that were related to one another were collated, and initial themes were formed. In this phase, codes sharing a common semantic pattern were grouped together into a single theme. Phase Four: Reviewing Themes: The initial themes were reviewed at two levels: the first level involved examining the internal coherence of each theme with its constituent codes; the second level entailed assessing the fit of the themes in relation to the entire dataset. During this phase, some themes were merged, others were split, and some were discarded. Phase Five: Defining and Naming Themes: For each theme, a precise definition was written, delineating its essence and scope. Additionally, concise and evocative names were selected for each theme that captured its core essence. Phase Six: Producing the Report: In the final phase, the findings were written up as a coherent narrative, accompanied by direct quotations from the participants. This report not only addresses the research question but also interprets the themes within the context of the theoretical literature.

Findings

First, a brief description of the demographic characteristics of the participants is presented (Table 1).

Table 1- Demographic Characteristics of the Participants

Code	Gender	Age	Education	Current Position/Occupation	Relevant Experience	Interview Duration	Interview Type
P1	Female	42	M.A. in Sports Management	Physical Education Teacher	3 health-oriented trips (Turkey, Germany, once to Iran-Mashhad)	48:15	Face-to-Face
P2	Male	45	Ph.D. in Graphic Design and Painting	Researcher	Researcher in the field of AI impacts on Iranian and Islamic art, architecture, and tourism	39:42	Online
P3	Male	53	Ph.D. in Hospitality Management	Director of Marketing and Business Development at Espinas Palace Hotel Tehran, and Senior Advisor to two hotels in Kish	20 years in hotel management (6 years in Dubai, 2 years in Turkey, 12 years in Iran), specialist in attracting health and sports tourists from the Persian Gulf countries and Russia	52:20	Online
P4	Male	46	Ph.D. in Sports Management	Director General of Physical Education and Sports Medicine Clinic	Head of the National Student Committee, Head of the National University Health Monitoring Association	32:00	Online
P5	Male	48	M.A. in Thermal and Fluid Mechanics	Researcher	Active in the fields of hardware, software, and programming	36:11	Face-to-Face
P6	Female	32	M.A. in Exercise Physiology	Bodybuilding and Fitness Trainer, Physical Education Teacher	10 years as a gym owner	29:13	Face-to-Face
P7	Male	45	Ph.D. in Computer Engineering	University Professor and Director of the Applied Data Mining and Artificial Intelligence Laboratory	18 years of research experience in recommender systems and natural language processing, collaboration with the Cultural Heritage Organization on the "Samt" project (Tourist Experience Management System), technical advisor to 2 smart tourism startups	52:36	Online
P8	Female	35	M.A. in Nutritional Sciences	Nutritionist	3 health-oriented trips (Turkey twice, Germany once)	19:20	Online
P9	Female	48	M.A. in Public Administration	Manager of a Travel Agency	14 years in medical and health tourism, collaboration with 30 hotels and clinics in Iran and Turkey	30:25	Online
P10	Male	28	Ph.D. Candidate in Artificial Intelligence	Researcher	Collaboration with 2 tourism startups and publication of 3 articles in this field	32:28	Face-to-Face
P11	Male	55	B.A. in Accounting	Retired Bank Employee	2 health-oriented trips (Turkey for knee physiotherapy, Mashhad for a weight loss program)	45:36	Online
P12	Female	38	M.A. in Hospitality Management	Manager of a Sports-Recreational Complex	10 years in the fitness industry, collaboration with 3 hotels to provide sports services to tourists	31:36	Online
P13	Male	50	Ph.D. in Management	Faculty Member at the Research Institute of Cultural Heritage and Tourism, and Former Advisor to the Cultural Heritage Organization	20 years of research in tourism policy-making	33:11	Face-to-Face
P14	Female	41	M.A. in Exercise Physiology	Yoga Instructor and Manager of a Fitness Studio	Travel to 12 countries for combining yoga and travel	26:29	Face-to-Face
P15	Female	39	Ph.D. in Philosophy of Science and Technology	Faculty Member at the Institute for Humanities and Cultural Studies	Researcher in technology ethics	18:02	Online

As shown in Table 1, the participant pool comprised a diverse range of stakeholders, with 7 females and 8 males aged between 28 and 55 years, reflecting a balanced gender distribution and a broad age spectrum that captures both early-career and highly experienced perspectives. The educational attainment of the participants was notably high, with the majority holding postgraduate degrees, including 6 doctoral-level qualifications, underscoring the specialized and expert-driven nature of the sample. In terms of professional background, the participants represented the three targeted categories of the study: health-oriented sports tourists with firsthand travel experience, industry practitioners with extensive operational and managerial tenure—ranging from 10 to 20 years in sectors such as hospitality, fitness, and travel agency management—and academic researchers and AI specialists with significant scholarly and technical expertise. The interview durations varied from approximately 18 to 52 minutes, with online interviews accounting for the majority of the sessions, thereby accommodating the geographical and time constraints of the participants while ensuring rich and in-depth data collection. Collectively, these characteristics indicate that the sample was purposefully constituted to yield comprehensive and multi-layered insights into the research phenomenon.

Next, the line-by-line analysis of the 15 interview transcripts yielded a total of 1,285 initial codes. During the refinement process, 216 codes were removed as they were deemed irrelevant to the research question (e.g., general discussions of unrelated tourism trends or personal anecdotes without conceptual value to the focal phenomenon). The remaining 1,069 codes were subjected to a rigorous process of merging semantically equivalent concepts. Specifically, codes that shared conceptual affinity—such as "exercise plan based on user history," "adaptive training intensity," and "workout schedule tailored to physical condition"—were collapsed into a single, more abstract basic theme, in this case, Personalized AI-Powered Exercise Program Design (M1). Through this iterative process, the 1,069 semantically relevant codes were consolidated into a final set of 42 basic themes. These themes represent the foundational building blocks of the participants' collective experiences and perspectives, capturing the multifaceted nature of the factors influencing the impact of artificial intelligence on optimizing the attraction of health-oriented sports tourists. These themes, along with their frequency of references and the corresponding participant codes, are presented in Table 2.

Table 2- Basic Themes Extracted from the Thematic Analysis

Row	Theme Code	Basic Theme	Number of References	Interviews Containing References
1	M1	Personalized AI-Powered Exercise Program Design	38	P1, P2, P3, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14
2	M2	Personalized Nutrition and Dietary Recommendations	29	P1, P2, P3, P6, P7, P8, P9, P10, P11, P12, P14
3	M3	Real-Time Physiological Data Monitoring via Wearables	32	P1, P2, P3, P4, P6, P7, P8, P9, P10, P12, P14
4	M4	Computer Vision for Movement Analysis and Correction	25	P1, P2, P3, P5, P6, P7, P10, P12
5	M5	Multi-Language AI Chatbots for 24/7 Support	31	P1, P2, P3, P5, P6, P7, P8, P9, P10, P11, P13, P14
6	M6	Sentiment Analysis for Detecting Tourist Dissatisfaction	22	P2, P3, P7, P10, P12, P13
7	M7	Recommender Systems for Destination and Service Selection	35	P1, P2, P3, P5, P6, P7, P8, P9, P10, P13, P14
8	M8	Dynamic and Real-Time Itinerary Adjustment Based on Context	26	P1, P2, P3, P7, P8, P10, P12, P14
9	M9	Pre-Travel Health Profiling and Risk Assessment	18	P1, P2, P3, P7, P10, P14
10	M10	Post-Trip Follow-Up and Long-Term Customer Retention	15	P1, P3, P7, P9, P13
11	M11	Transparency and Explicability of AI Decisions (XAI)	21	P1, P2, P3, P7, P9, P10, P13, P15
12	M12	User Control and Easy Opt-Out Mechanisms	19	P1, P2, P7, P8, P9, P10, P13, P15
13	M13	Human-in-the-Loop for Critical Health Decisions	20	P1, P2, P3, P7, P9, P10, P13, P15
14	M14	Advanced Data Encryption and Privacy-Preserving Technologies	18	P1, P7, P8, P9, P10, P11, P13, P15
15	M15	Guaranteed Data Deletion After Travel	14	P1, P3, P7, P8, P9, P11, P15
16	M16	Third-Party Certification and Auditing of AI Systems	12	P2, P3, P7, P9, P10, P12, P13

Row	Theme Code	Basic Theme	Number of References	Interviews Containing References
17	M17	Cultural Personalization of AI Interactions (Language, Etiquette)	27	P1, P2, P3, P5, P7, P8, P9, P10, P13, P14
18	M18	Respect for Religious Sensitivities and Calendars	28	P1, P2, P3, P4, P7, P8, P9, P11, P13, P14, P15
19	M19	AI-Driven Modesty and Privacy in Service Delivery	15	P1, P2, P3, P9, P12, P14
20	M20	Promotion of Cultural Diversity and Avoiding Filter Bubbles	16	P1, P2, P3, P7, P9, P10, P13, P14
21	M21	Localization of AI Models with Iranian-Islamic Data	22	P1, P2, P3, P7, P8, P9, P10, P13, P15
22	M22	Designing for Low Digital Literacy and Aging Populations	14	P6, P8, P9, P10, P11
23	M23	Public Distrust of Algorithms and Data Misuse Concerns	28	P1, P2, P3, P4, P5, P7, P8, P9, P10, P11, P13, P14, P15
24	M24	Resistance from Traditional Staff and Management Mindset	17	P2, P3, P5, P9, P10, P12, P13
25	M25	Unstable and Low-Speed Internet Infrastructure	21	P1, P3, P7, P8, P9, P10, P11, P12, P13, P14
26	M26	Lack of Affordable Local Cloud Computing Power	13	P2, P7, P10, P12, P13
27	M27	High Costs of Hardware, Software, and Implementation	26	P2, P3, P5, P7, P8, P9, P10, P11, P12, P13
28	M28	Lengthy and Uncertain Return on Investment	10	P2, P3, P7, P9, P10, P13
29	M29	Economic Sanctions Limiting Technology and Software Access	9	P2, P3, P10, P13
30	M30	Absence of a Comprehensive Data Protection and Privacy Law	20	P1, P2, P3, P7, P9, P10, P11, P13, P15
31	M31	Inter-Organizational Conflict and Lack of a Clear Governing Body	17	P2, P3, P10, P12, P13
32	M32	Lack of National Standards for Health Tourism Data Exchange	12	P2, P3, P9, P10, P13
33	M33	Absence of a National Strategy or Roadmap for AI in Tourism	14	P2, P3, P5, P13
34	M34	Shortage of Interdisciplinary Skilled Workforce	11	P1, P7, P10, P12, P13
35	M35	Need for Governmental Tax Incentives and Subsidies	15	P2, P3, P5, P7, P9, P10, P11, P12, P13
36	M36	Establishing a Pilot Project as a Proof of Concept	13	P3, P7, P8, P9, P10, P11, P12, P13
37	M37	Creation of a National Health Tourism Data Consortium	14	P2, P3, P7, P10, P12, P13
38	M38	Developing Specialized Academic Programs and Curricula	12	P1, P7, P9, P10, P12, P13
39	M39	Public-Private-Academia Partnership and Collaboration	18	P2, P3, P5, P7, P9, P10, P12, P13
40	M40	Learning from Pioneering Countries (UAE, Singapore, Germany)	19	P1, P2, P3, P5, P7, P8, P9, P12, P13, P14
41	M41	Simple and Intuitive User Interface for Non-Technical Users	16	P6, P7, P8, P9, P10, P11
42	M42	Building Trust through a National Transparency Campaign	10	P7, P8, P9, P11, P13

As illustrated in Table 2, the thematic analysis of the 15 in-depth interviews yielded a total of 1,285 initial codes, which, following a rigorous process of refinement—including the removal of duplicates and the merging of semantically equivalent concepts—culminated in the identification of 42 distinct basic themes. These themes represent the foundational building blocks of the participants' collective experiences and perspectives, capturing the multifaceted nature of the factors influencing the impact of artificial intelligence on optimizing the attraction of health-oriented sports tourists. A cursory examination of the frequency and distribution of these themes reveals several noteworthy patterns. First, the themes with the highest number of references—namely, Personalized AI-Powered Exercise Program Design (M1, 38 references), Recommender Systems for Destination and Service Selection (M7, 35 references), and Real-Time Physiological Data Monitoring via Wearables (M3, 32 references)—underscore the centrality of AI-driven personalization as the core value proposition for this niche market. This indicates that participants perceive the capacity of AI to tailor health and fitness experiences to individual needs as the most potent driver of tourist attraction and retention. Second, the data clearly point to a duality of enablers and barriers. Themes related to technological

capabilities, such as Multi-Language AI Chatbots (M5, 31 references) and Dynamic Itinerary Adjustment (M8, 26 references), are juxtaposed against a cluster of significant impediments. Notably, Public Distrust of Algorithms and Data Misuse Concerns (M23, 28 references) and High Costs of Implementation (M27, 26 references) emerged as pervasive challenges, with both being referenced across nearly all interviews. This suggests that while the technological promise is well-recognized, its realization is fundamentally contingent upon overcoming profound financial, cultural, and trust-related barriers. Third, the analysis highlights a strong and recurrent emphasis on the socio-cultural and ethical dimensions of AI deployment. The prominent themes of Respect for Religious Sensitivities (M18, 28 references), Cultural Personalization of AI Interactions (M17, 27 references), and the critical need for Transparency and Explainability of AI (M11, 21 references) collectively affirm that for the Iranian context, a purely technical solution is insufficient. The successful implementation of AI must be deeply interwoven with the country's specific cultural, religious, and ethical fabric. Finally, the themes point towards a clear agenda for action, encompassing Public-Private-Academia Collaboration (M39, 18 references), Learning from Pioneering Countries (M40, 19 references), and the critical role of government in creating a supportive legal and policy framework (e.g., M30, M33). The breadth and diversity of the 42 themes, spanning from granular technical features to macro-level policy recommendations, collectively paint a picture of a complex ecosystem that requires a holistic and multi-stakeholder approach to unlock the full potential of AI in Iran's health-oriented sports tourism industry.

To further substantiate the validity of the findings, a distributional analysis of the most prominent themes across the three participant groups was undertaken. This analysis revealed distinct yet complementary patterns of emphasis that reinforce the multi-faceted nature of the phenomenon. Themes related to the technological core of personalization, such as Personalized AI-Powered Exercise Program Design (M1) and Recommender Systems for Destination and Service Selection (M7), were predominantly articulated by industry practitioners (Group 2) and AI specialists (Group 3), who drew upon their operational and technical expertise to elaborate on the functional capabilities of AI systems. In contrast, health-oriented sports tourists (Group 1) contributed more vividly to themes concerning user experience and trust, particularly User Control and Easy Opt-Out Mechanisms (M12) and Guaranteed Data Deletion After Travel (M15), reflecting their direct concerns as end-users regarding privacy and autonomy. Notably, the theme Respect for Religious Sensitivities and Calendars (M18), with 28 total references, was the most evenly distributed theme across all three groups—referenced by 4 tourists, 4 industry practitioners, and 3 academics—indicating that cultural-religious considerations are not merely a consumer preference but a shared, system-level priority recognized by all stakeholders. Similarly, Public Distrust of Algorithms and Data Misuse Concerns (M23), the most pervasive barrier theme, was cited across all 15 participants irrespective of group affiliation, underscoring its status as a fundamental, cross-cutting challenge. In terms of forward-looking solutions, themes such as Establishing a Pilot Project as a Proof of Concept (M36) and Public-Private-Academia Partnership and Collaboration (M39) were primarily driven by industry practitioners and AI specialists, while tourists emphasized the need for Simple and Intuitive User Interfaces for Non-Technical Users (M41) and Building Trust through a National Transparency Campaign (M42). This triangulation of perspectives across participant groups strengthens the credibility of the thematic structure by demonstrating that the identified factors are not the artifact of a single stakeholder viewpoint but represent a convergent and holistic understanding of the research phenomenon.

Following the extraction of the 42 basic themes, the next step of the thematic analysis involved forming subordinate themes. In this phase, the basic themes were grouped together based on synonymity, interrelation, and conceptual commonality. Subordinate themes represent a higher level of abstraction and indicate the broader concept to which each set of basic themes refers. In this study, the 42 basic themes were rearranged into 12 subordinate themes. For each subordinate theme, the constituent basic themes and the total number of references (the sum of references for the related basic themes) are reported. Table 3 presents these themes along with their specifications.

Table 3- Subordinate Themes Formed from the Basic Themes

Row	Theme Code	Subordinate Theme	Constituent Basic Themes	Total References
		Category A: AI-Driven Personalized Services and Experience		
1	S1	AI-Powered Personalization of Health and Fitness Programs	M1, M2, M8, M9	111
2	S2	Intelligent Recommender and Decision Support Systems	M3, M3, M7	92
3	S3	AI-Enabled Communication and Support Interfaces	M5, M6	53
		Category B: Ethical, Cultural, and Social Considerations		
4	S4	Algorithmic Transparency, Trust, and Ethical Governance	M11, M12, M13, M14, M15, M16	104
5	S5	Cultural and Religious Sensitivity and Adaptation	M17, M18, M19, M20	86
6	S6	Localization and Culturally Contextual AI Design	M21, M22	36
		Category C: Barriers and Challenges		
7	S7	Socio-Cultural Resistance and Public Mistrust	M23, M24	45
8	S8	Technical and Infrastructural Deficiencies	M25, M26	34
9	S9	Financial and Economic Obstacles	M27, M28, M29	45
10	S10	Legal, Regulatory, and Policy Gaps	M30, M31, M32, M33	63
		Category D: Strategic Enablers and Solutions		
11	S11	Human Capital Development and Stakeholder Collaboration	M34, M38, M39	41
12	S12	Strategic Governance, Investment, and Implementation Roadmap	M35, M36, M37, M40, M41, M42	87

Table 3 provides a structured overview of the 12 subordinate themes into which the 42 basic themes were reorganized. A brief interpretation follows. The formation of these 12 subordinate themes, categorized into four overarching domains, reveals a nuanced and multi-layered conceptual structure underpinning the research phenomenon. Category A: AI-Driven Personalized Services and Experience, comprising the subordinate themes S1, S2, and S3, accumulates the highest total references, reaffirming that the core transformative potential of AI, as perceived by participants, lies in its capacity to deliver highly tailored, data-driven, and responsive services across the entire tourist journey—from pre-travel planning to real-time in-destination support. Category B: Ethical, Cultural, and Social Considerations, emerges as a distinct and critically important cluster, underscoring that technological implementation cannot be divorced from its socio-cultural context. The themes within this category, particularly S4 and S5, with their high reference counts, highlight that for AI to be successfully adopted in Iran's health-oriented sports tourism; it must be architected upon a foundation of transparency, trust, and deep respect for cultural and religious norms. This positions ethical governance not as an add-on, but as a prerequisite. Category C: Barriers and Challenges, systematically maps the obstacles impeding progress. The relatively balanced distribution of references across socio-cultural (S7), technical (S8), financial (S9), and legal (S10) barriers illustrates the interconnected and systemic nature of the challenges. The prominence of S10 (Legal, Regulatory, and Policy Gaps) with 63 references indicates that participants view the absence of a clear legal and policy framework as a fundamental bottleneck that exacerbates other challenges, particularly investment and innovation. Finally, Category D: Strategic Enablers and Solutions, points towards a forward-looking agenda. The themes S11 and S12 collectively suggest that participants believe overcoming the identified barriers requires a concerted, multi-stakeholder effort centered on human capital development, collaborative partnerships, and, most critically, a strategic governance framework and a phased, pilot-driven implementation roadmap. The high reference count for S12 (Strategic Governance, Investment, and Implementation Roadmap) signals a clear call for a top-down, coordinated national approach to unlock the potential of AI in this sector.

In the third and final step of the thematic analysis, the main themes were extracted. Main themes represent the highest level of abstraction in thematic analysis and signify the overarching, macro-level principles governing the findings. In this phase, the subordinate themes were grouped together based on semantic connections, theoretical alignment, and hierarchical structure, and were organized into several main themes. These main themes, in effect, structure the answer to the central research question: What are the factors influencing the impact of artificial intelligence on optimizing the attraction of sports tourists with a health-oriented approach? Table 4 presents these themes along with their constituent subordinate themes and the total number of references (the sum of references for the basic themes associated with each main theme).

Table 4- Main Themes Formed from the Subordinate Themes

Row	Theme Code	Main Theme	Constituent Subordinate Themes	Total References
1	T1	Technological Core: AI-Enabled Hyper-Personalization of the Health-Oriented Sports Tourism Experience	S1, S2, S3	256
2	T2	Ethical-Cultural Governance: Culturally Intelligent, Trustworthy, and Responsible AI	S4, S5, S6	226
3	T3	Systemic Impediments: A Multi-Layered Ecosystem of Barriers to AI Adoption	S7, S8, S9, S10	187
4	T4	Strategic Roadmap for Implementation: Integrated Governance, Investment, and Collaborative Action	S11, S12	128

The synthesis of the 12 subordinate themes into 4 main themes provides a holistic and structured response to the research question, revealing the key dimensions that influence the impact of AI on optimizing the attraction of health-oriented sports tourists in Iran. The four main themes, while distinct, are deeply interconnected and collectively constitute a comprehensive conceptual framework. Main Theme 1 (T1): Technological Core: AI-Enabled Hyper-Personalization of the Health-Oriented Sports Tourism Experience, with the highest total of 256 references, stands as the most prominent theme. It encapsulates the perceived transformative power of AI technologies—such as recommender systems, computer vision, and intelligent chatbots—to deliver deeply personalized, real-time, and data-driven health and fitness experiences. This theme represents the core value proposition of AI for this niche market, spanning the entire tourist journey from pre-travel profiling to post-trip follow-up, and directly addresses the "attraction and retention" dimension of the research question. Main Theme 2 (T2): Ethical-Cultural Governance: Culturally Intelligent, Trustworthy, and Responsible AI, with 226 references, emerge as an equally critical and non-negotiable foundation. This theme clearly establishes that, in the Iranian context, technological capability alone is insufficient. Successful AI deployment is contingent upon its design being deeply embedded within a framework of transparency, explainability, user control, and, most distinctively, profound respect for cultural and religious sensitivities. The high frequency of references indicates that participants view cultural intelligence and ethical governance not as peripheral considerations but as central prerequisites for building public trust and ensuring long-term adoption. Main Theme 3 (T3): Systemic Impediments: A Multi-Layered Ecosystem of Barriers to AI Adoption, with 187 references, maps the constellation of obstacles hindering progress. This theme reveals that the challenges are not isolated but rather form an interconnected, multi-layered ecosystem encompassing socio-cultural resistance, technical and infrastructural deficiencies, financial constraints, and a critical vacuum in legal and regulatory frameworks. The systemic nature of these impediments, particularly the highlighted legal and policy gaps, underscores that they collectively create an environment that stifles innovation, investment, and practical implementation. Main Theme 4 (T4): Strategic Roadmap for Implementation: Integrated Governance, Investment, and Collaborative Action, with 128 references, offer a forward-looking synthesis of the solutions and enablers proposed by participants. This theme outlines a clear call for a coordinated, multi-stakeholder, and phased approach. It emphasizes the necessity of a national strategy, public-private-academia collaboration, targeted investment in human capital, and, importantly, the initiation of small-scale pilot projects to generate proof of concept and build momentum. This theme transforms the identified challenges into an actionable agenda, suggesting that a top-down, collaborative governance model is the key to unlocking the potential identified in T1 while navigating the barriers outlined in T3 and upholding the ethical-cultural imperatives of T2. Together, these four main themes constitute a comprehensive model. They suggest that optimizing the impact of AI in Iran's health-oriented sports tourism hinges on a delicate balance: leveraging a powerful technological core (T1) that is rigorously governed by ethical and cultural intelligence (T2), while strategically navigating a complex web of systemic barriers (T3) through a concerted, multi-stakeholder strategic roadmap (T4).

Finally, the comprehensive hierarchical table of themes is presented, illustrating in an integrated manner how each main theme is constituted from subordinate themes, and in turn, how each subordinate theme is formed from the basic themes (Table 5).

Table 5- Comprehensive Hierarchical Thematic Structure (Basic, Subordinate, and Main Themes)

Main Theme	Subordinate Themes	Basic Theme
T1: Technological Core: AI-Enabled Hyper-Personalization of the Health-Oriented Sports Tourism Experience	S1: AI-Powered Personalization of Health and Fitness Programs	M1: Personalized AI-Powered Exercise Program Design, M2: Personalized Nutrition and Dietary Recommendations, M8: Dynamic and Real-Time Itinerary Adjustment Based on Context, M9: Pre-Travel Health Profiling and Risk Assessment
	S2: Intelligent Recommender and Decision Support Systems	M7: Recommender Systems for Destination and Service Selection, M3: Real-Time Physiological Data Monitoring via Wearables, M4: Computer Vision for Movement Analysis and Correction
	S3: AI-Enabled Communication and Support Interfaces	M5: Multi-Language AI Chatbots for 24/7 Support, M6: Sentiment Analysis for Detecting Tourist Dissatisfaction, M10: Post-Trip Follow-Up and Long-Term Customer Retention
T2: Ethical-Cultural Governance: Culturally Intelligent, Trustworthy, and Responsible AI	S4: Algorithmic Transparency, Trust, and Ethical Governance	M11: Transparency and Explainability of AI Decisions (XAI), M12: User Control and Easy Opt-Out Mechanisms, M13: Human-in-the-Loop for Critical Health Decisions, M14: Advanced Data Encryption and Privacy-Preserving Technologies, M15: Guaranteed Data Deletion After Travel, M16: Third-Party Certification and Auditing of AI Systems
	S5: Cultural and Religious Sensitivity and Adaptation	M17: Cultural Personalization of AI Interactions (Language, Etiquette), M18: Respect for Religious Sensitivities and Calendars, M19: AI-Driven Modesty and Privacy in Service Delivery, M20: Promotion of Cultural Diversity and Avoiding Filter Bubbles
	S6: Localization and Culturally Contextual AI Design	M21: Localization of AI Models with Iranian-Islamic Data, M22: Designing for Low Digital Literacy and Aging Populations
T3: Systemic Impediments: A Multi-Layered Ecosystem of Barriers to AI Adoption	S7: Socio-Cultural Resistance and Public Mistrust	M23: Public Distrust of Algorithms and Data Misuse Concerns, M24: Resistance from Traditional Staff and Management Mindset
	S8: Technical and Infrastructural Deficiencies	M25: Unstable and Low-Speed Internet Infrastructure, M26: Lack of Affordable Local Cloud Computing Power
	S9: Financial and Economic Obstacles	M27: High Costs of Hardware, Software, and Implementation, M28: Lengthy and Uncertain Return on Investment, M29: Economic Sanctions Limiting Technology and Software Access
	S10: Legal, Regulatory, and Policy Gaps	M30: Absence of a Comprehensive Data Protection and Privacy Law, M31: Inter-Organizational Conflict and Lack of a Clear Governing Body, M32: Lack of National Standards for Health Tourism Data Exchange, M33: Absence of a National Strategy or Roadmap for AI in Tourism
T4: Strategic Roadmap for Implementation: Integrated Governance, Investment, and Collaborative Action	S11: Human Capital Development and Stakeholder Collaboration	M34: Shortage of Interdisciplinary Skilled Workforce, M38: Developing Specialized Academic Programs and Curricula, M39: Public-Private-Academia Partnership and Collaboration
	S12: Strategic Governance, Investment, and Implementation Roadmap	M35: Need for Governmental Tax Incentives and Subsidies, M36: Establishing a Pilot Project as a Proof of Concept, M37: Creation of a National Health Tourism Data Consortium, M40: Learning from Pioneering Countries (UAE, Singapore, Germany), M41: Simple and Intuitive User Interface for Non-Technical Users, M42: Building Trust through a National Transparency Campaign

Table 5 provides a consolidated, hierarchical representation of the thematic structure. A brief interpretation follows. This comprehensive hierarchical table maps the complete thematic architecture of the research findings across three distinct levels of abstraction. The table clearly illustrates the logical and conceptual pathways through which the 42 basic themes (Level 1), grounded directly in the participants' raw data, are progressively synthesized into 12 broader subordinate themes (Level 2) and ultimately distilled into 4 overarching main themes (Level 3). As demonstrated, Main Theme T1 (Technological Core), with 256 references, represents the most frequently discussed dimension, drawing together all technologically oriented themes related to AI's functional capabilities for personalization, recommendation, and communication.

Main Theme T2 (Ethical-Cultural Governance), with 226 references, consolidates the critical governance requirements necessary for aligning these technological capabilities with socio-cultural values and building user trust. Main Theme T3 (Systemic Impediments), with 187 references, systematically categorizes the interconnected barriers across cultural, technical, financial, and legal domains that collectively hinder AI adoption. Finally, Main Theme T4 (Strategic Roadmap), with 128 references, synthesizes the proposed solutions into a coherent, multi-stakeholder action framework. The hierarchical structure of Table 5 thus serves as the foundational conceptual model of this study. It provides a systematic and comprehensive answer to the central research question—What are the factors influencing the impact of artificial intelligence on optimizing the attraction of sports tourists with a health-oriented approach? —by demonstrating that these factors are not isolated elements but are organized into a dynamic, multi-level system. This system requires a delicate and simultaneous balance: leveraging a powerful technological core (T1) governed by rigorous ethical and cultural intelligence (T2), while strategically navigating a complex web of systemic barriers (T3) through a concerted, multi-stakeholder strategic roadmap (T4). This integrated model offers a novel contribution to the literature by providing a holistic, context-sensitive framework for understanding and guiding AI implementation in Iran's health-oriented sports tourism industry.

Finally, at the end of this section, the tree diagram of the thematic network derived from the thematic analysis is presented in Figure 1.

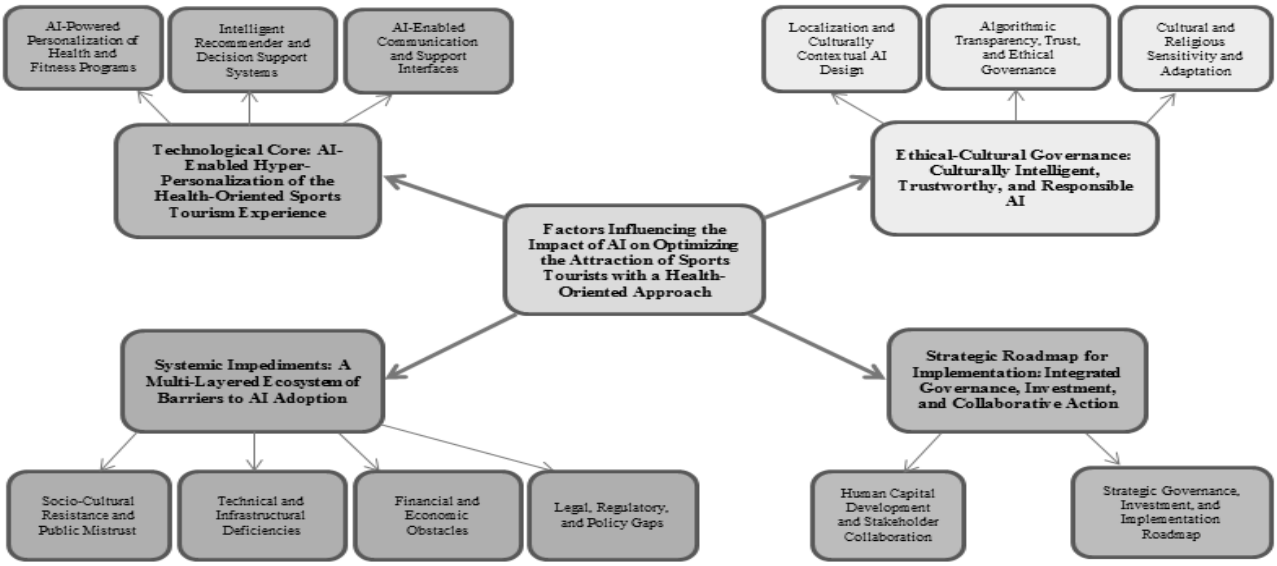

Figure 1. Tree Diagram of the Thematic Network of the Thematic Analysis

Discussion

The present study set out to identify the factors influencing the impact of artificial intelligence on optimizing the attraction of sports tourists with a health-oriented approach in Iran. Employing a qualitative exploratory design and drawing upon in-depth, semi-structured interviews with 15 participants from three key stakeholder groups—health-oriented sports tourists, industry practitioners and experts, and AI researchers and specialists—the study utilized reflexive thematic analysis based on the six-phase approach of Braun and Clarke (2006; 2021). This rigorous analytical process yielded a comprehensive hierarchical thematic structure comprising 42 basic themes, 12 subordinate themes, and 4 overarching main themes, which together form a multi-layered conceptual model. The four main themes are: (T1) Technological Core: AI-Enabled Hyper-Personalization of the Health-Oriented Sports Tourism Experience, comprising three subordinate themes and ten basic themes; (T2) Ethical-Cultural Governance: Culturally Intelligent, Trustworthy, and Responsible AI, comprising three subordinate themes and eleven basic themes; (T3) Systemic Impediments: A Multi-Layered Ecosystem of Barriers to AI Adoption, comprising four subordinate themes and ten basic themes; and (T4) Strategic Roadmap for Implementation: Integrated Governance, Investment, and Collaborative Action, comprising two subordinate themes and eleven basic themes. The following sections provide a detailed interpretation of each main theme, situating the findings within the existing body of literature.

Before examining each theme in detail, it is essential to delineate the dynamic interrelationships that bind

these four pillars into a coherent, systemic model. The thematic structure is not merely taxonomy of discrete categories but represents an integrated framework in which the themes interact in a mutually constitutive manner. Specifically, the Technological Core (T1) —the engine of AI-driven hyper-personalization—cannot operate in a vacuum; its design, deployment, and adoption are fundamentally shaped by the imperatives of Ethical-Cultural Governance (T2). For instance, the depth of personalization achievable through AI (T1) is directly constrained by the cultural and privacy safeguards demanded by users (T2), creating the privacy-personalization paradox discussed subsequently. Simultaneously, both T1 and T2 are embedded within, and profoundly constrained by, the ecosystem of Systemic Impediments (T3). The legal-regulatory vacuum and infrastructural deficiencies identified in T3 not only hinder the development of sophisticated AI applications (T1) but also erode the very trust that T2 seeks to cultivate. Conversely, the Strategic Roadmap (T4) emerges as the actionable synthesis that leverages the strengths of T1 and T2 while systematically addressing the barriers of T3. In this sense, T4 functions as the integrative mechanism that transforms the model from a static diagnostic framework into a dynamic, forward-looking strategy. The roadmap's emphasis on pilot projects, for example, is designed to generate local evidence (strengthening T1), build public trust through demonstrated transparency (reinforcing T2), and provide a controlled environment to navigate legal and financial obstacles (mitigating T3). This interplay underscores a central insight of the study: the successful implementation of AI in Iran's health-oriented sports tourism is not contingent upon optimizing any single pillar in isolation but upon orchestrating their dynamic equilibrium.

T1: Technological Core: AI-Enabled Hyper-Personalization of the Health-Oriented Sports Tourism Experience: The first and most prominent main theme, with 256 references, is constituted by three subordinate themes—AI-Powered Personalization of Health and Fitness Programs (S1), Intelligent Recommender and Decision Support Systems (S2), and AI-Enabled Communication and Support Interfaces (S3)—and encapsulates the perceived transformative power of AI technologies to deliver deeply personalized, data-driven health and fitness experiences across the entire tourist journey. Participants consistently emphasized the centrality of AI-powered personalization of exercise programs (M1), intelligent recommender systems for destination and service selection (M7), and real-time physiological monitoring through wearables (M3) as the core value proposition for attracting and retaining health-oriented sports tourists. As one industry expert (P3) articulated, the AI-driven ecosystem should operate across four layers of personalization—pre-travel, upon arrival, during the stay, and post-departure—thereby creating a seamless, responsive, and deeply individualized experience that transforms a generic trip into a personally meaningful health journey.

These findings are strongly aligned with the existing international literature. The emphasis on recommender systems and personalization corroborates the work of López-Naranjo et al. (2025), who identified natural language processing and deep learning as the most widely used AI technologies in tourism for automating interactions and personalizing services. Similarly, the findings resonate with the conclusions of Bulchand-Gidumal (2020) and Florido-Benítez & del Alcázar Martínez (2024), who positioned AI as a strategic tool for personalizing services, predicting tourist behavior, and enhancing the overall tourist experience. The multi-layered personalization model described by participants also echoes the research of Dai et al. (2024), who demonstrated the capacity of AI-driven predictive models to forecast health tourism behavioral intentions with high accuracy. Furthermore, the emphasis on wearable technology and real-time data monitoring aligns with the findings of Šakyte-Statnicke & Budryte-Ausiejiene (2025), which identified personalization of services and operational efficiency as primary benefits of AI-based digital tools. Within the domestic literature, the findings are consistent with the work of Hosseini and Hosseini (2024), which highlighted personalized recommendations and improved customer experience as key applications of AI in Iran's tourism industry, and with Kiani and Nazari (2025), who underscored the role of recommender systems and machine learning in optimizing fan and customer engagement. However, a notable point of departure from some domestic studies, such as those by Salahi Kojour et al. (2020; 2021), is the present study's specific focus on the health-oriented dimension. While prior domestic research has broadly addressed smart tourism and AI in the sports industry, it has not delved into the nuanced intersection of AI, sports, and health-oriented personalization. This study, therefore, extends the existing knowledge by demonstrating that, within the context of health-oriented sports tourism, personalization is not merely a value-added feature but the fundamental product and the primary driver of attraction and retention.

In conclusion, T1 establishes that the technological core of AI—centered on hyper-personalization through recommender systems, real-time physiological monitoring, and intelligent communication interfaces—constitutes the foundational capability upon which the successful attraction of health-oriented sports tourists is built.

T2: Ethical-Cultural Governance: Culturally Intelligent, Trustworthy, and Responsible AI: The second

main theme, with 226 references, is constituted by three subordinate themes—Algorithmic Transparency, Trust, and Ethical Governance (S4), Cultural and Religious Sensitivity and Adaptation (S5), and Localization and Culturally Contextual AI Design (S6)—and emerges as T a critically important and equally weighted dimension, asserting that technological capability alone is insufficient for successful AI adoption in Iran's health-oriented sports tourism context. This theme consolidates the essential requirements for ethical governance and cultural intelligence into a coherent framework. Participants placed strong emphasis on algorithmic transparency and explainability (M11), user control and easy opt-out mechanisms (M12), and the indispensable role of a human-in-the-loop for critical health decisions (M13). Most distinctively, the findings underscored the profound necessity for cultural and religious sensitivity (M17, M18), including respect for the Hijri calendar, halal dietary requirements, gender-segregated service preferences, and culturally appropriate communication styles. As one participant (P3) from the hospitality sector insightfully noted, technology must serve human choice, not replace it, and should facilitate and respect cultural differences rather than impose a single, homogenized ethical framework.

These findings find substantial support in both international and domestic literature. The emphasis on transparency, data security, and privacy aligns with the systematic review by López-Naranjo et al. (2025), which identified ethical concerns and privacy issues as critical challenges requiring careful management for appropriate AI deployment in tourism. The findings also resonate with the work of Stojanovic et al. (2025), who highlighted the importance of integrating AI within strategic and regulatory frameworks. Within the domestic literature, the results are highly consistent with the work of Forghani (2024), who emphasized the need to address data security, ethical considerations, and the digital divide in AI-driven health tourism. They also corroborate the research of Jamaat et al. (2024) and Nateghian and Salimi Nejad (2024), who respectively highlighted ethical and legal considerations and the necessity of robust regulatory frameworks for AI in health tourism. The findings of Salehi and Bidram (2024) on the role of AI in managing online reputation and building trust further reinforce this theme. A significant point of alignment with Hashemi and Zahmatkesh Sardorahi (2025) is the shared identification of project mismanagement and big data analysis challenges as pivotal concerns. However, the present study extends this body of knowledge by foregrounding the specifically Iranian-Islamic cultural dimension. While prior research has broadly acknowledged ethical concerns, this study uniquely illuminates the granular and context-specific nature of cultural intelligence required—encompassing not just general privacy but nuanced religious and cultural sensitivities such as the Fiqh basis for halal certification, the need for non-judgmental AI, and the critical distinction between cultural facilitation and ethical imposition.

It is important to acknowledge, however, that the cultural and religious sensitivities identified here—while rich and multi-faceted—were articulated predominantly from an Iranian-Islamic insider perspective. The extent to which these specific sensitivities are shared, prioritized, or perhaps supplemented by other concerns among international health-oriented sports tourists from diverse cultural backgrounds remains an open empirical question. This limitation, which is further elaborated in the limitations section, suggests that the cultural intelligence framework proposed in this study should be viewed as a necessary but not sufficient foundation, requiring validation and enrichment through the direct inclusion of international tourist perspectives in future research.

In conclusion, T2 establishes that ethical-cultural governance, characterized by transparent, user-controlled, and culturally intelligent AI, is not a peripheral consideration but a non-negotiable prerequisite. The successful optimization of AI's impact in this domain is contingent upon embedding these principles into the very architecture of AI systems, thereby ensuring they are trustworthy, respectful, and aligned with the values of both domestic and international health-oriented sports tourists.

A critical tension emerging from the juxtaposition of T1 and T2 warrants explicit discussion, the inherent paradox between the demands for deep, data-driven personalization and the equally strong insistence on privacy preservation and user control. On one hand, the realization of AI-enabled hyper-personalization (T1) necessitates the continuous collection and analysis of sensitive physiological, behavioral, and locational data. On the other hand, the ethical-cultural governance framework (T2) mandates user sovereignty, data minimization, and the right to opt out. These two imperatives can appear contradictory—the more personalized the experience, the more intrusive the data collection; the stricter the privacy controls, the more limited the personalization potential. However, the findings of this study suggest that this paradox is not irreconcilable. Participants across all three groups pointed towards a resolution strategy grounded in three complementary principles: (a) privacy-preserving AI architectures, such as federated learning and on-device processing, which allow algorithms to learn from user data without the raw data ever leaving the user's device (as explicitly recommended by P7 and P15); (b) granular and dynamic consent mechanisms, whereby users can selectively authorize specific data streams for specific purposes (e.g., permitting heart rate

monitoring for exercise adjustment but not for marketing profiling), with the ability to revoke consent at any time; and (c) transparent value exchange, wherein the benefits of data sharing are made explicit and tangible to the user—for instance, the system communicating that "because you allowed us to monitor your sleep quality, we were able to adjust today's exercise intensity, reducing your risk of injury by an estimated 15%." This transforms privacy from a zero-sum trade-off into a collaborative value-creation process. The present study thus extends the literature by demonstrating that, in the context of health-oriented sports tourism, privacy and personalization are not opposing ends of a spectrum but mutually reinforcing dimensions of a trustworthy AI ecosystem—provided that the technological architecture is intentionally designed to uphold both simultaneously. This insight contributes a novel resolution to a tension that has been largely underexplored in the extant literature on AI in tourism.

T3: Systemic Impediments: A Multi-Layered Ecosystem of Barriers to AI Adoption: The third main theme, comprising 187 references, is constituted by four subordinate themes—Socio-Cultural Resistance and Public Mistrust (S7), Technical and Infrastructural Deficiencies (S8), Financial and Economic Obstacles (S9), and Legal, Regulatory, and Policy Gaps (S10)—and systematically maps the interconnected constellation of obstacles that collectively hinder the adoption of AI in Iran's health-oriented sports tourism industry. The findings reveal that these barriers are not isolated incidents but form a deeply intertwined, multi-layered ecosystem spanning four critical domains: socio-cultural, technical, financial, and legal-regulatory. The socio-cultural dimension is dominated by pervasive public distrust of algorithms and data misuse concerns (M23) and resistance from traditionally minded staff and management (M24). Technically, the most pressing issues are unstable and low-speed internet infrastructure (M25) and the lack of affordable local cloud computing power (M26). Financially, participants highlighted the prohibitively high costs of hardware, software, and implementation (M27), coupled with lengthy and uncertain returns on investment (M28), a situation exacerbated by economic sanctions (M29). Most critically, the legal and regulatory domain, with the highest reference count within this theme (63 references), was identified as the fundamental bottleneck, characterized by the absence of a comprehensive data protection and privacy law (M30), persistent inter-organizational conflict and the lack of a clear governing body (M31), the absence of national standards for health tourism data exchange (M32), and the lack of a national AI in tourism strategy (M33). As one senior policymaker (P13) lamented, "Until we specify which minister is responsible for coordinating this area, nothing will happen".

These findings are extensively corroborated by the existing literature. The identified challenges with data privacy, high costs, and technical infrastructure align closely with the work of López-Naranjo et al. (2025) and Šakyte-Statnicke & Budryte-Ausiejiene (2025), who catalogued similar obstacles in the broader tourism and hospitality sectors. The findings resonate with Al-Orainat (2025), who identified limited digital infrastructure, high implementation costs, and workforce skill gaps as primary barriers to AI adoption in Arab countries. Within the domestic literature, the results are strikingly consistent with the work of Hosseini and Hosseini (2024), which specifically identified security and privacy issues, the need for continuous technical training, and high implementation and maintenance costs as key challenges facing AI in Iran's tourism industry. The findings also align with Hashemi and Zahmatkesh Sardorahi (2025), who identified poor project planning and management, big data analysis challenges, and insufficient R&D funding as the most significant challenges in health tourism in Yazd province. The legal and regulatory vacuum highlighted in this theme directly corroborates the findings of Forghani (2024) regarding the need for robust regulations. However, a notable strength of the present study is its demonstration of the systemic and cascading nature of these barriers. While prior research has often listed these challenges as discrete items, the present analysis reveals their deep interconnection. For instance, the legal vacuum (S10) directly exacerbates financial barriers (S9) by discouraging investment, while technical deficiencies (S8) compound socio-cultural distrust (S7) by creating unreliable user experiences that further erode public confidence. This systemic perspective represents a novel contribution to the domestic literature on AI in tourism.

In conclusion, T3 reveals that the barriers to AI adoption in health-oriented sports tourism in Iran constitute a systemic and self-reinforcing ecosystem. Addressing these impediments in isolation is unlikely to yield sustainable progress; rather, a holistic and coordinated intervention strategy that simultaneously tackles legal, financial, technical, and socio-cultural dimensions is essential.

T4: Strategic Roadmap for Implementation: Integrated Governance, Investment, and Collaborative Action: The fourth main theme, with 128 references, is constituted by two subordinate themes—Human Capital Development and Stakeholder Collaboration (S11) and Strategic Governance, Investment, and Implementation Roadmap (S12)—and provides a forward-looking and action-oriented synthesis of the solutions and strategic enablers proposed by participants for overcoming the identified barriers and unlocking the potential of AI. This theme articulates a clear call for a coordinated, multi-stakeholder, and

phased approach, integrally linking human capital development and stakeholder collaboration (S11) with a broader strategic governance, investment, and implementation roadmap (S12). Key solutions include the creation of a national health tourism data consortium (M37), the establishment of a pilot project as a proof of concept (M36), government tax incentives and subsidies (M35), specialized academic programs (M38), and public-private-academia partnerships (M39). Crucially, participants identified the need to learn from pioneering countries such as the UAE, Singapore, and Germany (M40), while emphasizing the necessity of adapting these global models to Iran's unique economic, cultural, and infrastructural context. As one computer engineering professor (P7) pragmatically advised, "Start with a small, real, and economy-driven pilot project, not from hundreds of theoretical meetings and document writing.

These findings resonate with and extend the existing literature. The emphasis on multi-stakeholder collaboration aligns with the work of Stojanovic et al. (2025), who situated AI integration within strategic and regulatory frameworks. The call for a national strategy and roadmap echoes the recommendations of Wang et al. (2025), who urged practitioners and policymakers to develop proactive strategies and industry standards for AI applications. Within the domestic literature, the findings are consistent with the work of Aghaei Khan Mohammad et al. (2025), who emphasized that the successful integration of digital technologies with sports tourism requires simultaneous attention to infrastructure, human resources, and supportive legislation and policymaking. The results also align with the conclusions of Bashokooh and Forouzan (2025), who demonstrated the positive and significant impact of AI on attracting foreign tourists through the mediating role of digital marketing, thereby implicitly supporting the need for strategic investment in digital capabilities. The call for learning from global models is supported by the work of Ahmadi Aliabad and Ahmadi Aliabad (2025) and Yousefi et al. (2025), who highlighted the substantial potential of AI to transform health tourism. However, the present study makes a distinct contribution by providing a granular, actionable, and context-sensitive roadmap. It moves beyond general recommendations to specify the precise roles of government, the private sector, and academia, and uniquely champions a "pilot-first" strategy. This emphasis on a small-scale, real-world pilot project as a catalyst for building confidence, generating local data, and demonstrating return on investment—before scaling—responds directly to the financial and trust barriers identified in T3. This pragmatic, phased approach represents a novel and practically significant contribution to the discourse on AI implementation in Iran's tourism sector.

While the preceding analysis has focused extensively on barriers and strategic enablers, it is equally critical to recognize that Iran possesses a distinctive portfolio of indigenous assets that, if strategically integrated with AI, can transform the country into a competitive destination for health-oriented sports tourism. These assets—frequently highlighted by participants as latent strengths—include: (a) an extensive network of natural mineral hot springs (e.g., Sarein, Mahalat) with scientifically recognized therapeutic properties for musculoskeletal and dermatological conditions; (b) diverse climatic and geographical zones within a single country, enabling the simultaneous offering of skiing and winter sports in the Alborz and Zagros mountains while coastal water sports and thalassotherapy are available along the Persian Gulf and Caspian Sea; (c) a well-established medical infrastructure with internationally trained physicians offering high-quality health services at significantly lower costs compared to regional competitors such as the UAE and Turkey; (d) a rich tradition of holistic wellness practices—including traditional Persian medicine, herbal therapy, and culturally embedded rituals of hospitality—that can be differentiated from standardized global wellness offerings; and (e) a young, educated, and increasingly digitally native population that constitutes both a skilled workforce and a domestic market for technology-driven health tourism services. The strategic roadmap proposed in this study (T4) is predicated not merely on overcoming barriers but on purposefully deploying AI as a catalyst to unlock these indigenous strengths—for example, by using recommender systems to intelligently match specific mineral springs with tourists' particular health profiles, or by employing computer vision to deliver personalized skiing technique coaching on Iran's slopes. This shift from a defensive posture (merely addressing impediments) to an offensive, asset-driven strategy reframes the narrative, positioning AI not as a compensatory mechanism for deficiencies but as an amplifier of Iran's inherent competitive advantages in the global health-oriented sports tourism market.

In conclusion, T4 provides a coherent and actionable strategic roadmap. It posits that the successful implementation of AI in health-oriented sports tourism in Iran hinges on a nationally coordinated, multi-stakeholder effort that prioritizes investment in human capital, creates a supportive legal and financial ecosystem, and adopts a pragmatic, pilot-driven, and evidence-based approach to scaling innovation.

Here are concise and practical recommendations based on the research findings, tailored for key stakeholders: A) For Policymakers and Government Bodies: 1) Draft and ratify a comprehensive "Health Tourism Data Protection and Privacy Act" to establish clear legal boundaries, define liability in case of algorithmic error, and provide a secure framework that encourages both investor confidence and tourist trust

(Akhavan et al., 2023). KPI: Reduction in the number of reported data privacy complaints from health tourists by at least 50% within two years of enactment, 2) Designate a single coordinating authority for AI in health-oriented sports tourism to resolve the current inter-organizational fragmentation among the Ministries of Tourism, Health, Sports, and ICT, and mandate the creation of a unified national strategy. KPI: Establishment of the authority and publication of the national strategy within 18 months; a 30% reduction in inter-agency licensing turnaround time within the first year of operation, and 3) Establish a "Special Smart Health Tourism Innovation Zone" in a receptive location such as Kish Island, offering tax incentives, customs exemptions on smart hardware, and streamlined licensing to attract private-sector investment and serve as a national testbed. KPIs: Attraction of at least 10 AI-driven health tourism startups within three years; a 20% increase in health-oriented sports tourist arrivals in the zone within five years. B) For the Private Sector (Hoteliers, Travel Agencies, Sports Clubs, and Investors): 1) Launch a "National Health Tourism Data Consortium" where hotels, clinics, and sports centers pool anonymized and non-sensitive data to enable the training of locally relevant AI algorithms, thereby overcoming the current data scarcity that hinders effective personalization. KPI: Enrollment of at least 30 member organizations within two years; a 25% improvement in the accuracy of AI-generated personalized recommendations as measured by user acceptance rates, 2) Invest in a small-scale, rigorously evaluated pilot project in a single hotel or sports complex—ideally in a high-traffic health tourism hub like Mashhad or Kish—to generate tangible proof of concept, measure return on investment, and build a replicable model before large-scale deployment. KPIs: A minimum 15% increase in guest satisfaction scores (measured via validated post-stay surveys); a 10% increase in repeat bookings attributable to AI-enhanced services within one year of pilot completion, and 3) Design AI interfaces with radical simplicity and cultural intelligence: ensure chatbots are multi-lingual (Persian, Arabic, Russian, English), adopt a polite and indirect communication tone aligned with Iranian cultural norms, and incorporate features tailored for older adults and users with low digital literacy. KPIs: A minimum 85% user satisfaction rate with AI interface usability (measured through the System Usability Scale); less than 5% abandonment rate of AI services due to complexity complaints. C) For Universities and Research Institutions: 1) Create an interdisciplinary academic program in "Smart Health Tourism Management" that integrates coursework in tourism, exercise physiology, nutrition, AI, and data law to address the critical shortage of skilled professionals capable of bridging these domains. KPI: Graduation of at least 50 specialized professionals within the first five years, with a minimum 70% employment rate in the health tourism and AI sectors within one year of graduation, 2) Reorient postgraduate research towards applied, industry-linked pilot projects by partnering with hotels and sports clubs as "living labs," ensuring that dissertations produce not only theoretical contributions but also scalable and implementable AI solutions. KPI: At least 5 industry-partnered pilot projects initiated per year in collaborating universities; a minimum of 3 peer-reviewed publications co-authored with industry practitioners annually, and 3) Conduct and publish an annual ethical audit of AI systems deployed in the tourism and health sectors to benchmark transparency, privacy protection, and cultural sensitivity, thereby reinforcing public trust and providing guidance to industry practitioners. KPI: Publication of the first national audit report within 24 months; a 20% year-on-year increase in the number of AI systems voluntarily submitting to audit within three years.

Conclusion

This study developed a four-pillar model for understanding the factors influencing AI's impact on attracting health-oriented sports tourists in Iran, revealing that technological hyper-personalization, while foundational, is insufficient without a robust framework of ethical-cultural governance that embeds transparency, user control, and deep respect for religious and cultural norms into AI systems. The research further uncovered a self-reinforcing ecosystem of legal, financial, technical, and socio-cultural barriers, with the absence of a comprehensive regulatory framework acting as the principal bottleneck. To overcome these challenges, the study advocates a pragmatic, phased strategy anchored in small-scale pilot projects and multi-stakeholder collaboration.

The emergent four-pillar model can be further illuminated by grounding it within established theoretical frameworks. Specifically, the centrality of perceived usefulness and perceived ease of use—core constructs of the Technology Acceptance Model (TAM) (Davis, 1989)—is reflected in the model's emphasis on AI's tangible value proposition (T1) and the critical need for simple, intuitive interfaces (M41). The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), with its dimensions of performance expectancy, effort expectancy, social influence, and facilitating conditions, provides a more comprehensive lens: performance expectancy maps onto the hyper-personalization core (T1); effort expectancy aligns with the call for user-centric design (M41, M22); social influence directly resonates with the pervasive socio-cultural barriers and public distrust (T3); and facilitating conditions correspond precisely

to the strategic roadmap's emphasis on legal frameworks, financial incentives, and technical infrastructure (T4). Crucially, the model's strong focus on trust, transparency, and cultural sensitivity (T2) extends beyond classic technology acceptance theories and is best explained through the lens of trust theory in technology, particularly the dimensions of ability, benevolence, and integrity (Mayer et al., 1995). In the context of this study, ability translates to AI's demonstrated competence in delivering health outcomes (T1); benevolence is manifested in culturally respectful, non-judgmental AI that prioritizes user well-being over commercial gain (M18, M19); and integrity is operationalized through transparency, explainability, and robust privacy safeguards (M11, M14, M15). By explicitly linking the inductively derived four-pillar model to these deductive theoretical frameworks, the study not only validates the model's conceptual coherence but also enhances its transferability, positioning it as a context-sensitive extension of established technology adoption paradigms to the unique domain of AI-enabled health-oriented sports tourism in a culturally complex setting.

In conclusion, Iran can leverage its considerable natural and cultural assets to become a regional hub for health-oriented sports tourism, provided that AI implementation is guided by a balanced approach integrating technological innovation, ethical integrity, and cultural authenticity.

Research Limitations and Suggestions for Future Research

The present study, while offering a comprehensive and contextually grounded conceptual model, is subject to several limitations that should be acknowledged. First, the qualitative and exploratory nature of the research, while ideal for depth and richness, limits the generalizability of the findings. The sample, though carefully purposive and diverse, was confined to 15 participants, and the insights generated are deeply embedded in the specific socio-cultural and economic context of Iran. Second, the study employed a cross-sectional design, capturing perceptions and experiences at a single point in time. Given the rapid pace of technological evolution in artificial intelligence, stakeholder attitudes, barriers, and opportunities may shift significantly in a short period. Third, and perhaps most substantively, the study did not include international health-oriented sports tourists who have actually visited or are currently visiting Iran. All 15 participants—including the five individuals categorized as "health-oriented sports tourists" (Group 1)—were Iranian nationals whose travel experiences were either outbound (to destinations such as Turkey and Germany) or domestic (within Iran). This constitutes a material limitation that fundamentally shapes the nature of the findings. The conceptual model developed in this study is, therefore, predominantly grounded in the perspectives, expectations, and cultural frameworks of domestic stakeholders—Iranian tourists, Iranian industry practitioners, and Iranian academics. While this provides an invaluable, contextually rich understanding of the supply-side and domestic demand-side dynamics, it leaves a critical gap regarding the perceptions, preferences, cultural sensitivities, and trust concerns of the very international tourists whom Iran seeks to attract. For instance, the cultural and religious sensitivities identified in T2 (e.g., halal food, Hijri calendar observance, gender-segregated services) were articulated from an Iranian-Islamic cultural standpoint. An international tourist from a different cultural background—such as a secular European, a Buddhist from East Asia, or a Sunni Muslim from the Persian Gulf—may hold meaningfully different expectations and sensitivities that are not fully captured in the present model. Consequently, while the model provides a robust foundation for understanding the domestic ecosystem, its direct applicability to international tourist attraction strategies must be approached with caution. Future research that explicitly incorporates the voices of international health-oriented sports tourists is essential to validate, refine, and culturally extend the model for cross-cultural application.

Building upon the contributions and addressing the limitations of this study, several promising avenues for future research are proposed: 1) Conduct a quantitative study to empirically validate and test the proposed conceptual model. A large-scale survey based on the 42 basic themes and 4 main themes identified here could be administered to a broader sample of stakeholders. Structural equation modeling (SEM) could then be employed to examine the causal relationships, mediating effects, and relative weights of the identified factors, thereby transforming the exploratory model into a confirmatory and predictive framework, 2) Undertake a longitudinal or panel study to track the evolution of stakeholder perceptions, technological adoption, and regulatory developments over time. Such a design would be particularly valuable for capturing the dynamic interplay between technological advancement, policy change, and shifts in public trust, providing critical insights into the temporal dimension of AI ecosystem development, 3) Execute an action research or pilot implementation study within a single hotel or sports complex. By designing, deploying, and rigorously evaluating an AI-powered health-oriented tourism service over a defined period, future researchers could generate rich, real-world data on user acceptance, technical performance, cultural friction points, and actual return on investment—addressing a key gap identified by this study's participants, 4) Expand the participant base to include currently active international health-oriented sports tourists in Iran, as

well as technology vendors and startup founders. Capturing the authentic, in-situ experiences and expectations of actual tourists, and the supply-side perspective of technology providers, would add significant depth and external validity to the model, and 5) Conduct comparative case studies across countries such as Turkey, the UAE, and Malaysia to systematically analyze how differing regulatory, cultural, and economic contexts shape the trajectory of AI adoption in health-oriented sports tourism. Such comparative research would yield valuable lessons for contextual adaptation and policy transfer, directly informing the implementation roadmap the present study advocates.

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Conflicts of Interest

There is no conflict of interest.

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Statement on the Use of AI

This manuscript is the product of a multi-stage, human-led research process. The conceptualization of the study, the formulation of research questions, the design of the qualitative methodology, the conduct of all 15 in-depth interviews in Persian, the manual line-by-line coding of 1,285 initial codes, the iterative thematic analysis following Braun and Clarke's (2006; 2021) six-phase framework, the synthesis of themes, and the interpretation of findings were all conducted entirely by the authors without any AI assistance. AI-based tools were employed in a strictly supportive and editorial capacity during the final stage of manuscript preparation. Specifically, large language models (LLMs), including ChatGPT (OpenAI, GPT-4), were used for the following limited and human-supervised purposes: 1. Translation assistance: The original interview transcripts, codes, thematic labels, and initial analytical memos were all generated in Persian. AI tools were used to assist in translating these materials into academic English. All AI-generated translations were subsequently reviewed, revised, and validated by the authors, who are proficient in both languages, to ensure conceptual accuracy and cultural nuance were preserved. 2. Language polishing and academic style refinement: After the authors drafted each section in English, AI tools were used to enhance sentence flow, grammatical accuracy, and adherence to academic writing conventions. In every instance, the AI-generated suggestions were critically evaluated by the authors, and final editorial decisions rested entirely with the human researchers. 3. Reference formatting: AI assistance was used to ensure consistent APA 7th edition formatting of the reference list.

References

Aghaei Khan Mohammad, T., Azizian Kohan, N., Moharramzadeh, M., & Naghizadeh Baghi, A. (2025). *The application of artificial intelligence in the development of citizen sports and the promotion of urban health.* First International Conference on Citizen Sports and Sustainable Development. https://civilica.com/doc/2455796 [In Persian].

Ahmadi Aliabad, N., & Ahmadi Aliabad, J. (2025). *The role of artificial intelligence in the transformation of health tourism: Benefits and challenges.* Ninth International Conference on Management, Tourism and Technology. https://civilica.com/doc/2131608 [In Persian].

Akhavan, E., Alnoori, A. H. K., & Ghadirian Marnani, F. (2023). Feasibility of Implementing an Electronic Government System in Executive Sport Organizations of Iraq. *Archives in Sport Management and Leadership, 1*(1), 103-119. https://doi.org/10.22108/jhs.2023.137076.1012

Allami, A. S. (2025). *Sports tourism between 2020 and 2024: An analytical perspective*. https://B2n.ir/fj9042

Al-Orainat, L. M. (2025). The impact of artificial intelligence on tourism management decisions: From demand forecasting to service customization. *SSRN*. http://dx.doi.org/10.2139/ssrn.5337532

Asefi, A. (2025). Determining sample size in qualitative research: Implications for sport management studies. *Archives in Sport Management and Leadership, 3*(2), 61-69. https://doi.org/10.22108/asml.2025.147693.1126

Attride-Stirling, J. (2001). Thematic networks: An analytic tool for qualitative research. *Qualitative Research, 1*(3), 385–405. https://doi.org/10.1177/146879410100100307

Bashokooh, M., & Forouzan, M. A. (2025). The impact of artificial intelligence on attracting foreign tourists with the mediating role of digital marketing. *Geography and Human Relations, 8*(2), 155–171. https://doi.org/10.22034/gahr.2024.453108.2098 [In Persian].

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. Sage Publications. https://uk.sagepub.com/en-gb/eur/thematic-analysis/book248481

Bulchand-Gidumal, J. (2020). Impact of artificial intelligence in travel, tourism, and hospitality. In Z. Xiang et al. (Eds.), *Handbook of e-Tourism*. Springer. https://doi.org/10.1007/978-3-030-05324-6_110-1

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications. https://B2n.ir/md6636

Dai, H., Lee, S. N., & Chong, K. M. (2024). An artificial intelligence prediction approach for behavioral intentions of health tourism: A protection motivation theory-based perspective. *Applied Mathematics and Nonlinear Sciences, 9*(1), 1–19. https://doi.org/10.2478/amns-2024-2747

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, *13*(3), 319-340. https://doi.org/10.2307/249008

Efe, A. (2023). An assessment over the impact of artificial intelligence on sports activities and the sports industry. *Çanakkale Onsekiz Mart Üniversitesi Spor Bilimleri Dergisi, 6*(3), 76–101. https://www.researchgate.net/publication/375026031

Florido-Benítez, L., & del Alcázar Martínez, B. (2024). How artificial intelligence (AI) is powering new tourism marketing and the future agenda for smart tourist destinations. *Electronics, 13*, 4151. https://doi.org/10.3390/electronics13214151

Forghani, M. R. (2024). *Development of the health tourism industry with artificial intelligence and metaverse technology.* First National Conference on Futures Studies in Medical, Wellness and Nature Tourism (Health Tourism). https://civilica.com/doc/2295198 [In Persian]

Gan, T., Zheng, J., Li, W., Li, J., & Shen, J. (2023). Health and wellness tourists' motivation and behavior intention: The role of perceived value. *International Journal of Environmental Research and Public Health, 20*, 4339. https://doi.org/10.3390/ijerph20054339

Ghanbari, A., Soltanhoseini, M., Halajpoor, Z., & Borgheyan, Z. (2025). Emerging Business Development Model in the Sports Industry. *Archives in Sport Management and Leadership, 3*(1), 23-43. https://doi.org/10.22108/asml.2025.143617.1057

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods, 18*(1), 59–82. https://doi.org/10.1177/1525822X05279903

Hashemi, S. S., & Zahmatkesh Sardorahi, M. (2025). Challenges of applying artificial intelligence in the health tourism industry. *Tourism and Development*. https://www.itsairanj.ir/article_228977_en.html [In Persian].

Hosseini, A., & Hosseini, N. (2024). *The application of artificial intelligence in Iran's tourism industry*. First National Conference on the Era of Technology Explosion: Artificial Intelligence, a Transformation in Industry, Trade and Supply Chain. https://civilica.com/doc/2227515 [In Persian].

Jamaat, A., Asbaghi, S., & Khezraei Shoulayfar, S. (2024). *AI-based applications in health tourism*. Second National Conference on Psychology and Family Counseling (with a Focus on Psychology, Management, Information Technology and Health Tourism). https://civilica.com/doc/215817 [In Persian].

Jokela, S. (2024). *Impact of artificial intelligence on business and management processes in the sports industry* [Bachelor's thesis, Lappeenranta-Lahti University of Technology LUT]. https://lutpub.lut.fi/handle/10024/168297

Kiani, S., & Nazari, L. (2025). Novel applications of artificial intelligence in sports marketing: A systematic review of trends, opportunities, and challenges. *Quarterly Journal of Modern Studies in Management and Organization, 2*(2), 27-43. https://doi.org/10.22034/jmsmo.2025.537681.1036 [In Persian].

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.

López-Naranjo, A. L., Puente-Riofrio, M. I., Carrasco-Salazar, V. A., Erazo-Rodríguez, J. D., & Buñay-Guisñan, P. A. (2025). Artificial intelligence in the tourism business: A systematic review. *Frontiers in Artificial Intelligence, 8*, 1599391. https://doi.org/10.3389/frai.2025.1599391

Lu, W. (2022). *On the mechanism of artificial intelligence affecting sports tourism industry*. ICMSSP 2022: 2022 7th International Conference on Multimedia Systems and Signal Processing. https://dl.acm.org/doi/10.1145/3545822.3545831

Lukose, A., Thomas, S. N., Ks, S., Bose, J., Jacob, G., & Simon, B. (2024). Exploring the frontiers of health tourism: A bibliometric analysis of research themes and trends. *Cureus, 16*(8), e66832. https://doi.org/10.7759/cureus.66832

Mayer, R. C., Davis, j. H., & Schoorman, F. D. (1995). An Integrative Model of Organizational Trust. *The Academy of Management Review, 2*0(3), 709-734. https://doi.org/10.2307/258792

Memon, S. B., Qureshi, J. A., & Shah, S. B. (2025). *AI-powered ChatGPT in sports tourism: Benefits, challenges, and future prospects*. IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-8482-4.ch004

Momenifar, F., Pourranjbar, M., & Farazyani, F. (2024). The impact of artificial intelligence on sports marketing: Applications and limitations. *Journal of New Studies in Sport Management, 5*(1), 1066–1080. https://doi.org/10.22103/jnssm.2023.22042.1218

Nateghian, Z., & Salimi Nejad, F. (2024). *The impact of artificial intelligence on health tourism marketing: An exploration of applications and challenges.* First National Conference on Futures Studies in Medical, Wellness and Nature Tourism (Health Tourism). https://civilica.com/doc/2295199 [In Persian].

Rahmani, M., Majedi, N., Hemmatinejad, M., & Jamshidi, A. (2024). Application of artificial intelligence in the sports industry: A review article. *AI and Tech in Behavioral and Social Sciences*, *2*(2), 20–27. https://doi.org/10.61838/kman.aitech.2.2.4

Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing data* (3rd ed.). Sage Publications.

Salahi Kojour, A., Razavi, S. M. H., Amirnejad, S., Mohammadi, N., & Taghipourian, M. J. (2021). Presenting a qualitative model of smart tourism in the sports industry. *Journal of Sport Management*, *14*(3), 117–132. https://doi.org/10.22059/jsm.2021.304168.2502 [In Persian].

Salahi Kojour, A., Razavi, S. M. H., Amirnejad, S., Mohammadi, N., & Taghipourian, M. J. (2020). Analyzing the factors affecting smart tourism in the sports industry based on the meta-synthesis technique. *Tourism Planning and Development*, *9*(34), 101–120. https://doi.org/10.22080/jtpd.2020.17753.3180 [In Persian].

Salehi, S., & Bidram, R. (2024). *The impact of artificial intelligence on the branding development of health tourism destinations.* First National Conference on Futures Studies in Medical, Wellness and Nature Tourism (Health Tourism). https://civilica.com/doc/2295172 [In Persian].

Šakyte-Statnicke, G., & Budryte-Ausiejiene, L. (2025). Application of artificial intelligence in the tourism sector: Benefits and challenges of AI-based digital tools in tourism organizations of Lithuania, Latvia, and Sweden. *Tourism and Hospitality*, *6*(2), 67. https://doi.org/10.3390/tourhosp6020067

Smith, C. S. (2019, November 19). Dealing with bias in artificial intelligence. *The New York Times*. https://B2n.ir/wj8531

Stebbins, R. A. (2001). *Exploratory research in the social sciences*. Sage Publications. https://doi.org/10.4135/9781412984249

Stojanovic, I., Stranjancevic, A., & Osamanovic, N. (2025). *The role of artificial intelligence in tourism development.* 14th International Scientific Conference Science and Higher Education in Function of Sustainable Development. https://B2n.ir/uj9370

UNWTO. (2020). *Global report on sports tourism*. https://www.unwto.org/

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS quarterly*, *27*(3), 425-478. https://doi.org/10.2307/30036540

Wang, S., Wang, Q., Cui, Q., & Lan, T. (2025). Artificial intelligence in tourism: A systematic literature review and future research agenda. *Sustainability*, *17*, 9080. https://doi.org/10.3390/su17209080

Weed, M., & Bull, C. (2012). *Sports tourism: Participants, policy and provider*s. Routledge.

Yousefi, F., Gholami, M., & Biabanikhankahdani, R. (2025). On the role of artificial intelligence in the development of health tourism: A literature review. *International Healthcare Review*. https://doi.org/10.56226/132