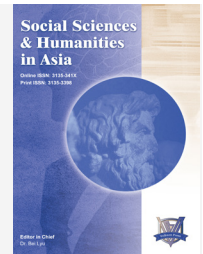




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RESEARCH ARTICLE

AI-Driven Digital Marketing and Consumer Behavior in Medical Tourism: From Personalization to Privacy Concerns

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ABSTRACT

Background and Purpose: The use of artificial intelligence (AI) in digital marketing has changed how consumers make decisions regarding medical tourism. AI can provide tailored information and recommendations to users, thereby increasing user engagement and improving perceived usefulness. At the same time, the use of personal and health-related data raises significant privacy concerns, especially in the context of cross-border healthcare and the potential misuse of sensitive and secure data. In light of this issue, this research examines how AI-based personalization affects consumer engagement in medical tourism. Trust is theorized as a central psychological mechanism that amplifies the positive effects of AI personalization on consumer engagement while attenuating the negative effects of privacy concerns.

Methods: A quantitative research design was employed, with data collected from 280 individuals who had researched medical tourism services. The collected data were analyzed using the Statistical Package for the Social Sciences and Smart Partial Least Squares.

Results: The findings indicate that AI personalization has a positive effect on consumer engagement, while privacy concerns have a negative effect. Trust plays an important mediating role by reducing the perceived risks associated with personalization and enhancing consumer engagement.

Conclusion: The findings reveal a privacy-personalization paradox and provide implications for the development of ethical and transparent AI-based marketing strategies in the field of medical tourism.

KEYWORDS

Medical Tourism, Digital Marketing, AI-driven Personalization, Consumer Behavior, Privacy Concerns, Trust

1. INTRODUCTION

There has been huge growth in the medical tourism industry, making it one of the fastest-growing industries in the world (Sharma, Bharti & Malik, 2022). This has occurred due to increased costs associated with healthcare (Choi & Liang, 2024), along with longer wait times for medical procedures (DeMicco et al., 2022), as well as unequal access to quality health services around the world (Chaudhry, 2022). With this change in circumstance, patients are starting to travel greater distances to receive affordable, quality, and timely medical care. India is quickly becoming one of the leading destinations for medical tourism because of its high-quality healthcare system, internationally qualified physicians, and lower prices for health care (Mahida, 2024). As the number of attendees at medical tourism facilities grows, the amount of business being offered or provided for such facilities increases. Therefore, the ability of a healthcare facility to retain international customers is also impacted by its use of digital marketing strategies to attract and retain international patients (Enderwick & Nagar, 2011).

The shift in marketing for the healthcare industry to digital through the implementation of artificial intelligence (AI) technologies (Swan et al.,

2024) has led to a decline in traditional methods of referring patients through communication and using AI to create digital ecosystems that deliver personalised healthcare goods and services. AI allows healthcare providers to interact with consumers throughout all stages of their decision-making process, including information-seeking, hospital selection, and post-treatment communication, through predictive analytics, recommendation systems, and intelligent chatbots. The use of personalised digital interactions makes healthcare information more relevant and accessible; reduces consumer decision complexity; and improves the overall experience of the consumer (Shastry & Lakshmi, 2025).

The impact on consumer behaviour from AI-driven personalised communications can be understood using the stimulus-organism-response (S-O-R) model, whereby personalised digital stimuli create internal cognitive and emotional evaluations of consumers that subsequently impact their behavioural outcomes such as engagement and intention to act. In addition, the technology acceptance model (TAM) indicates that perception of a technology as useful and effective will create positive attitudes and behaviours amongst users. AI-driven personalised touch points can improve consumer engagement by

providing greater convenience, relevance, and efficiency of consumer decision-making in medical tourism because of the high sensitivity and abundance of information required when making healthcare decisions.

Even though AI-driven personalized services have many advantages, they also have raised serious concerns about data privacy and ethical considerations surrounding the use of personal data. AI systems rely heavily on ongoing collection and processing of behavioral, demographic, and medical data to provide personalized recommendations and communications. In healthcare, consumers frequently associate high levels of risk with the misuse of personal information (data privacy), surveillance, unauthorised use, sharing, and lack of transparency, as this is highly sensitive information. The privacy calculus theory (PCT) suggests that individuals weigh the advantage of receiving a personalised service versus the risk they perceive when disclosing their personal information. Although consumers are likely to value receiving a personalised healthcare service, the increase in awareness regarding how companies deal with data has raised concern about the protection of privacy, creating a privacy-personalisation paradox in digital healthcare settings.

In this case, trust can be considered an important element for how consumers respond to AI-driven digital marketing strategies. Through the experience of the consumer, their healthcare provider and digital platform type may invoke a sense of trust that can reduce perceived uncertainty and associated risks, thus increasing confidence about data usage and willingness to accept and seek personalized service offerings (Catapan et al., 2025); whereas low levels of trust can increase privacy concerns and reduce positive responses toward AI-enabled health care platforms. Trust is especially important in the case of medical tourism, since there is high perceived risk associated with making big decisions that involve financial investment, physical health and emotional vulnerability, whereby trust is a key factor affecting consumer engagement and decision-making behaviour (Nguyen et al., 2026).

Prior research has explored AI-driven personalization, privacy concerns and trust; however, existing research is inconsistent and fragmented. Most scholarly works have focused on these variables as separate issues or have primarily focused on traditional e-commerce and domestic health care service sectors. Very little empirical work has examined the combined effect of AI-driven personalization, privacy concerns, and trust in the context of medical tourism, since consumers making cross-border health care decisions have both high perceived risk and significant data disclosure associated with their decision-making process. Therefore, there is a substantial theoretical and contextual knowledge gap in how these variables interrelate and affect consumer behaviour upon an AI-enabled medical tourism platform.

These findings extend the work of Nguyen et al. (2026) by demonstrating that trust functions not merely as an antecedent but as a psychological buffer that attenuates the negative effect of privacy concerns on engagement. This aligns with PCT, wherein consumers engage in cost-benefit evaluations; however, the present results suggest that trust recalibrates this calculus in favor of engagement even under elevated privacy sensitivity—a dynamic particularly salient in healthcare contexts where data vulnerability is heightened.

In order to fill this gap in the literature, the present research provides an integrated framework that combines TAM, PCT, and the S-O-R framework. The purpose of this study is to investigate the relationship between AI-driven digital marketing and consumer engagement in the context of medical tourism. More specifically, this study will investigate whether (a) AI-based personalization positively impacts consumers and their engagements, (b) privacy concerns negatively affect consumers and their responses towards AI-enabled healthcare, and (c) trust is the primary factor that affects consumer engagements in AI-based healthcare.

This research makes contributions to the literature in three significant ways. First, this research integrates an understanding of consumers' behavior in medical tourism, specifically looking at personalization, privacy concerns, and trust through a single conceptual model. Second, this research expands on existing research in AI-based marketing strategies in healthcare by focusing on the unique aspects of decisions

made for cross-border healthcare. Finally, this research has application for healthcare providers, digital marketers, and facilitators of medical tourism in creating guidelines for developing transparent, ethical, and trustworthy marketing strategies based on AI. With continued growth in the use of AI in healthcare, the ability for consumers to understand their balancing of benefits from personalization and the risks to their privacy has become paramount for creating sustainable and responsible independent digital health systems.

Using the integrated theoretical framework, this research proposes that personalization through AI positively impacts consumer engagement in medical tourism and that privacy concerns negatively impact consumer engagement with AI-based digital marketing. Additionally, it is anticipated that trust has a positive impact on consumer engagement within AI-enabled healthcare platforms by decreasing perceived uncertainty and ultimately increasing confidence in the digital interactions. This study seeks to provide greater insight into consumer decision-making dynamics within medical tourism and consumers as they utilize electronic media.

2. LITERATURE REVIEW AND CONCEPTUAL MODEL

AI has rapidly spread, drastically altering the digital marketing landscape within many different industries, such as digital marketing in healthcare and medical tourism (Reshadi & Chehragh, 2025). AI marketing refers to using advanced computer science techniques (e.g., machine learning, natural language processing, computer vision, predictive analytics) to automate decision-making, personalize interactions between users and businesses, and improve how customers interact with an organization (Davenport et al., 2020). These computational methods also allow organizations to process and analyze large volumes of behavioral data and create predictive insights that can be used to support real-time decision-making. For instance, AI-based marketing systems have increasingly been implemented in the healthcare industry to identify potential patients, segment audiences by health-seeking behavior, and dynamically customize digital content to meet the needs of individual users (Weingott & Parkinson, 2025).

Previous research has indicated that AI significantly changes marketing logic from traditional segmentation-based marketing strategies toward an individualized prediction of behaviors and anticipation of behaviors through the use of predictive models (Rust & Huang, 2021). This shift is especially important for services provided by the healthcare industry because consumers frequently make high-risk, emotionally charged decisions to seek services from a variety of organizations when there is a high level of uncertainty (high-risk), ambiguity regarding services expected or received, and few objective or consistent criteria to measure a physician's capabilities to successfully treat patients (Rust & Huang, 2021). This scenario is amplified in the case of medical tourism because patients must assess healthcare providers in a different country while attempting to make sense of the ambiguous and disparate information relative to informational asymmetries, regulatory variances, and cultural dissimilarities, all of which add uncertainty to patients' decision-making processes.

Digital marketing is an important digital channel within the medical tourism industry as it reduces the amount of information asymmetry that exists between providers of medical services and international patients who are attempting to access those medical services (Weingott & Parkinson, 2025). Prior studies have shown that the information asymmetry creates a significant obstacle to making decisions about obtaining cross-border medical services (Lunt & Carrera, 2010). As a result, digital platforms have been able to reduce the effect of this information asymmetry by providing access to information about hospitals, patient reviews, treatment comparison information, and teleconsultation services (Subramaniam et al., 2019). Advances in technology have increased transparency and help empower patients to look for and evaluate healthcare options outside of their own home healthcare system (Mesko et al., 2025).

More research continues to highlight the expanding influence of digital communications in determining how medical tourism flows are made. Specific examples include the visibility of medical tourism destinations

being expanded via online platforms, search engine marketing, social media engagement, and influencer-based marketing, and expanded examples include how emerging medical tourism hubs (i.e., India) utilize hospital websites, healthcare aggregators, and digital consultation platforms during the first phases of patient decision-making. Also, new messaging and communication channels through digital means are utilized during the appointment scheduling process, medical record sharing, and planning cross-border treatment (FICCI Healthcare Committee, 2023). Collectively, these new changes demonstrate that digital marketing has become the central mechanism for attracting international patients instead of traditional referral-based systems.

The ability for AI-driven digital marketing to provide personalized experiences is a key development. Personalization is defined by Vesanen (2007) as adjusting digital content, services, and communications so that they are applicable to a given user based on their characteristics, behaviours, and context. In marketing literature, personalization has consistently resulted in improved consumer experience such as increased consumer engagement, improved customer connections, and higher likelihood of purchase and adoption (Tam & Ho, 2005). By providing individualized and relevant information, personalized systems are able to increase.

Personalization enhances patient engagement and decision-making confidence in healthcare. As an example of the positive impact of personalized health information on patients' intentions to pursue preventive and elective medical services, Hawkins et al. (2020) found that providing individualized health information helped motivate people to seek preventive and elective services. AI delivers personalized experiences on medical tourism platforms through its recommendation system by breaking down complex decision-making paths (by filtering through treatment alternatives and finding appropriate providers) and providing personalized treatment options for consumers; thus, providing personalized experiences for consumers will likely enhance engagement because healthcare information will provide increased relevance, clarity, usability, etc.

Even with these advantages, as digital systems become more personalized, there are many serious concerns with privacy related to data-based services. Malhotra et al. (2004) classify the privacy concerns of digital services by the following three categories: (a) awareness of data collection, (b) control of personal information, and (c) risk of data misuse. Because medical records are very private and sensitive, there is an increased concern about privacy in healthcare applications than there is in other applications because the effects of disclosing this information may impact individuals on multiple levels: socially (i.e., stigma), financially (i.e., debt), and emotionally (i.e., mental health), because of the sensitive nature of the information contained in medical records (Angst & Agarwal, 2009).

The privacy paradox (Karwatzki et al., 2017) is the conflict between the advantages of personalization and worries about data disclosure that is often mentioned. This phenomenon is the discrepancy between people's stated worries about privacy and their real desire to expose personal information in return for apparent advantages (Acquisti & Grossklags, 2005). This paradox gets really complex in healthcare settings. Sensitive data may be shared by patients if they think it would directly improve medical treatment, accuracy, or results (Nazi, 2013). But privacy issues can get worse and cause opposition to digital platforms if data collection methods seem unclear, financially driven, or badly controlled. Especially pertinent in AI-driven medical tourism systems, where individualized recommendations greatly depend on ongoing examination of personal and health-related data (Yorulmaz, 2025), this dynamic tension is rather important.

In such dangerous digital settings, trust becomes a crucial factor affecting customer behavior (Yorulmaz, 2025). Trust in digital healthcare systems works at several levels: trust in digital platforms, trust in healthcare professionals, and trust in the algorithmic decision-making process (Taddeo, 2010). Studies done before show that perceived risk, especially privacy-related risk, reduces technology adoption plans and negatively impacts trust (Featherman & Pavlou, 2003). Regarding medical tourism, trust becomes even more crucial as consumers have to depend on unknown facilities in other regulatory and cultural settings (Aydin &

Karamehmet, 2017).

Therefore, trust helps to determine consumer interpretation of AI-driven personalization and assessment of privacy-related trade-offs (Aydin, 2026). Consumers who have great confidence in healthcare systems and digital platforms are more likely to find personalization desirable and acceptable (Catapan et al., 2025). On the other hand, a lack of trust can make privacy issues worse and lessen the desire to use AI-enabled healthcare solutions.

Table 1 lists important earlier studies on AI, personalization, privacy issues, trust, and consumer behavior in digital healthcare and medical travel settings so as to offer a better grasp of the current body of knowledge. The table draws attention to the main theoretical approaches, research settings, main results, and lingering limits within the material. As shown, past research has mostly looked at customization, privacy, and trust as distinct ideas usually inside general digital commerce or domestic healthcare settings.

Though research on digital healthcare marketing is increasing, some significant knowledge gaps still exist. Though privacy issues have been thoroughly researched in the fields of digital health and e-commerce, most empirical studies concentrate on general internet services or national healthcare systems. Consequently, the interaction between AI-driven personalization and privacy issues in medical tourism's cross-border setting still needs to be better understood. Given the great seen risk, financial repercussions, and cultural variety connected with worldwide medical travel, this points to a major contextual vacuum in ongoing study.

Several studies investigate personalization and privacy issues as separate concepts instead of as intertwined elements of a larger consumer decision-making process. This incomplete view makes it difficult to fully grasp how customers weigh the advantages and drawbacks of AI-driven digital marketing systems.

While trust is generally acknowledged to be a major factor in technology acceptance, it is usually handled as a static attitudinal characteristic. Recent debates in AI ethics and digital governance indicate that trust ought to be seen as a dynamic process that develops over several interactions, apparent openness, and gathered user experience. Still, this idea of changing trust is understudied in research on medical travel and healthcare marketing.

In order to fill the identified gaps, the current study utilizes an integrated theoretical approach by combining the PCT, TAM, and S-O-R framework. PCT indicates how consumers weigh the benefits associated with personalized services against the possible risks resulting from the release of personal information (Dinev & Hart, 2006). Conversely, the TAM explains how perceived usefulness and trust are causal mechanisms for influencing technology adoption decisions (Davis, 1989). Finally, the S-O-R framework provides an organized explanation of how external technological stimuli influence an individual's mind, which will ultimately lead to the individual's behavior (Mehrabian & Russell, 1974).

Within this integrated framework, trust is conceptualized not as a formal mediator but as a key organism-level variable—an internal evaluative state that directly shapes behavioral engagement in response to AI-driven stimuli, consistent with the S-O-R model's organism component.

Integrating these separate but thematically related theoretical perspectives creates a more complete framework to examine AI-based personalization as an external stimulus in developing consumer trust and privacy concerns, both of which ultimately influence the engagement behaviour of individuals using medical tourism service platforms. This integrated conceptual framework creates a deeper understanding of how consumers process information within an AI-based healthcare setting and will contribute to a broader understanding of digital health marketing and medical tourism research.

2.1 Research Hypotheses

The hypotheses below are derived from the outlined research goals as

Table 1 Summary of Prior Studies on AI, Personalization, Privacy, and Trust in Digital Healthcare and Medical Tourism

Author(s)	Research context	Key variables	Key findings	Research gap
Davis (1989)	Information systems / technology adoption	Perceived usefulness, perceived ease of use	TAM explains how perceived usefulness drives technology adoption and user behavior	Does not address AI-driven personalization or healthcare contexts
Tam & Ho (2005)	Online marketing	Personalization, consumer response	Personalization increases user engagement and purchase intention in digital environments	Limited focus on healthcare and sensitive data contexts
Malhotra et al., (2004)	Online privacy	Privacy concerns, information disclosure	Consumers' concerns about data collection and control influence their willingness to disclose personal information	Does not explore AI-based personalization or medical decision-making
Acquisti & Grossklags (2005)	Digital privacy behavior	Privacy concerns, disclosure behavior	Introduced the privacy paradox showing mismatch between privacy attitudes and behavior	Limited examination in healthcare or medical tourism
Featherman & Pavlou (2003)	E-services adoption	Perceived risk, trust	Perceived risk negatively affects adoption, while trust improves user acceptance	Context limited to general e-services rather than healthcare
Angst & Agarwal (2009)	Electronic health records	Privacy concerns, trust	Privacy concerns strongly influence trust and adoption of health IT systems	Focus on domestic healthcare rather than cross-border medical tourism
Hawkins et al. (2020)	Digital health communication	Personalized health information, patient engagement	Personalized health information increases intention to seek healthcare services	Limited examination of AI-driven marketing systems
Rust & Huang (2021)	AI in Marketing	AI, predictive marketing	AI shifts marketing from segmentation toward individualized prediction and automation	Healthcare marketing applications require further empirical exploration
Lunt & Carrera (2010)	Medical tourism	Information asymmetry, patient mobility	Information gaps are a major barrier for international patients choosing healthcare abroad	Does not consider AI-enabled digital marketing tools
Runnels & Carrera (2012)	Medical tourism industry	Global medical travel, digital promotion	Online platforms significantly influence destination visibility and patient decision-making	Limited focus on privacy and trust issues
Turner (2019)	Global healthcare mobility	Medical tourism platforms	Digital platforms facilitate cross-border healthcare decisions	AI-driven personalization mechanisms not examined
Taddeo (2010)	Digital ethics	Trust in digital systems	Trust is fundamental for ethical and sustainable digital interactions	Limited application to healthcare marketing
Davenport et al., (2020)	AI marketing	AI analytics, marketing automation	AI enables predictive marketing and personalized communication at scale	Implications for healthcare marketing remain underexplored
Dinev & Hart (2006)	Privacy calculus	Perceived benefits, perceived risks	Individuals evaluate benefits against privacy risks before disclosing personal data	Limited healthcare-specific applications

well as the technology adoption model (TAM) combined with the PCT and S-O-R model:

H1: AI-driven personalized marketing will have a very positive impact on a consumer's interest in participating in medical tourism. The benefits associated with personalised marketing are compared against their risks to aid the consumer's rational decision-making. If, after weighing the benefits and the risks, the risks outweigh the benefits, it is likely that the consumer will not engage in the marketing. This leads to our second hypothesis.

H2: The Privacy Issues will have a significant negative impact on the consumer's interest in engaging with AI based digital marketing for medical tourism. Trust is generally accepted to be an important factor affecting the behaviour of consumers within both digital and healthcare situations, especially when there are uncertainties or when consumers feel there is some degree of potential risk.

H3: Trust positively influences consumer engagement through AI-enabled healthcare platforms. In accordance with the S-O-R model established by Mehrabian & Russell (1974) and Featherman & Pavlou (2003), trust is an internal psychological state that helps to translate an external stimulus into positive behaviours.

2.2 Conceptual Model

Figure 1 depicts a conceptual framework that shows the primary interactions driving consumer engagement in AI-enabled medical tourism platforms. This model identifies three main independent variables that determine the likelihood of consumers engaging with, continuing to use, or recommending digital healthcare services: AI-driven personalisation, concern about privacy (in how their data is used), and trust.

The conceptual model presents exactly three hypothesized paths: H1 (AI-driven personalization → consumer engagement), H2 (privacy concerns → consumer engagement), and H3 (trust → consumer engagement).

→ consumer engagement), and H3 (trust → consumer engagement). No additional paths were hypothesized or tested in this study.

3. METHODOLOGY

Using a quantitative approach, this research investigates the impact of AI-enabled personalized communications on the level of customer engagement with regard to medical tourism services. The potential effects of privacy concerns and consumer trust are also taken into account within this context. The research design uses established behavioral theory to guide the examination of the research variables, including the TAM, the PCT, and the S-O-R model. Primary data for the research was collected from survey participants who had used (or had an interest in using) medical tourism services using a cross-sectional survey design and were subjected to statistical analysis to test for relationships between the research variables.

3.1 Sample

280 people were collected using a structured questionnaire. Purposive sampling, and the people sampled had either been to medical travel services or had considered using them during the last 3 years, thus making them relevant to this research study.

The questionnaires were then distributed online using Google Forms and shared through digital and social media related to healthcare. Data collection took place over a six-week time period, with only complete and valid responses included in the data set for analysis.

3.2 Data Collection Tool

The survey instrument was developed based on validated scales from prior studies on AI-driven personalization and consumer behavior in healthcare and tourism contexts (Tussyadiah, 2020; Luo et al., 2021). The survey contained a total of two parts. The first part of the survey

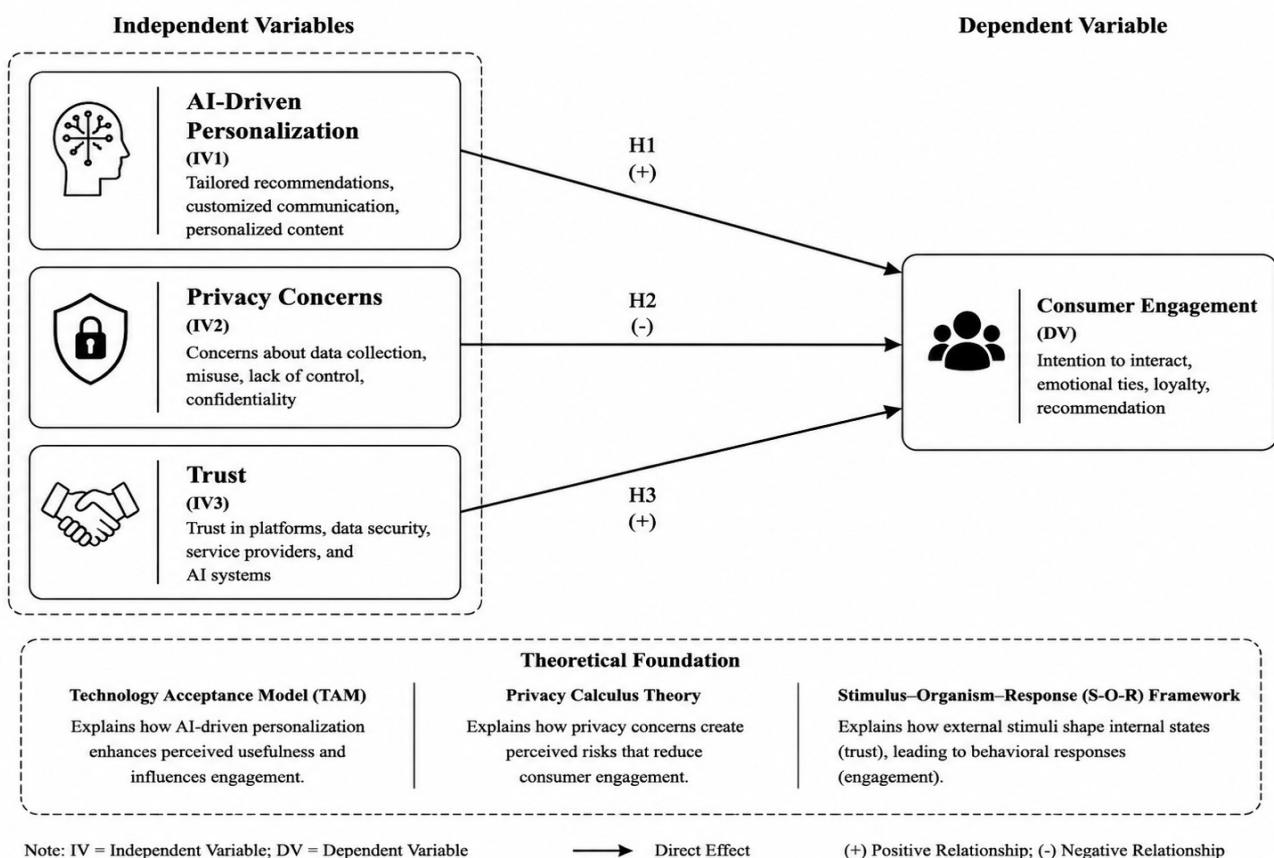


Figure 1 The Proposed Conceptual Model

collected demographic data (such as age, gender, and education) of participants. The survey instrument was developed based on validated scales from prior studies on AI-driven personalization and consumer behavior in healthcare and medical tourism contexts (Tussyadiah, 2020; Luo et al., 2021; Huang & Rust, 2021).

3.3 Variables and Measurement

The questionnaire items were adapted from established scales as follows: AI personalization (3 items) was adapted from Tam & Ho (2005) and Vesanen (2007), measuring perceptions of personalized recommendations. Privacy concerns (3 items) were drawn from Malhotra et al. (2004) IUIPC scale, addressing data collection, misuse, and control. Trust (3 items) were adapted from Featherman and Pavlou (2003), assessing platform reliability and data security. And consumer engagement (3 items) were adapted from Kumar et al. (2019), measuring interaction likelihood and service continuance. All items were reviewed by two academic experts in digital health marketing to confirm contextual relevance to AI-driven medical tourism. A pilot test was conducted with 30 respondents to assess item clarity; minor wording adjustments were made based on feedback before full distribution. All constructs were measured with five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree), with minor modifications of wording to fit the context of medical tourism and AI-driven digital marketing.

3.4 Demographic Characteristics of Respondents

The demographic data of 280 individuals responding to the survey are shown in Table 2. The sample is comprised of 45.7% males and 54.3% females. Therefore, the gender distribution is fairly evenly divided. The age range is predominantly in the 36–45 bracket (31.1%), and the next largest group was those who are 46–plus years old (26.1%), meaning that middle-aged and older adult participants represent a large portion of the population sample. Educationally, most individuals have a bachelor's degree (45.0%) compared to secondary (high school). However, a good-sized minority have attained a master's (13.6%) or doctoral (11.1%) degree. Overall, the demographic characteristics of this sample represent an excellent diversity and therefore are representative of a sample that would be appropriate to examine consumer behaviour as it relates to AI-based trips, etc.

4. RESULTS AND DISCUSSION

4.1 Multicollinearity Assessment

A variance inflation factor (VIF) analysis was performed to assess possible multicollinearity problems regarding the independent variables in this study. The VIF scores for the measurement items in this study ranged from 1.661 to 2.255 for all of the independent variables. The VIF values for the AI-driven personalization measurement items ranged from 1.836 to 2.064, the privacy concerns measurement items ranged from 2.068 to 2.255, the trust measurement items ranged from 1.717 to 2.053, and the consumer engagement measurement items ranged from 1.661 to 2.003. According to Hair et al. (2017), a VIF score below 5.0 indicates that there is no significant multicollinearity between the independent variables. Consequently, the findings of this analysis establish that the independent variables are not significantly correlated, and the independent variables of this study can be relied upon as being valid and reliable in order to estimate the structural model in this study.

The structural model was estimated using SmartPLS 4 with a bootstrapping procedure of 5,000 subsamples and no sign changes, following Hair et al. (2019). The sample size of 280 was assessed against the 10-times rule and confirmed as adequate for the model's maximum number of paths directed at any single construct (three paths). Model specification followed a reflective measurement approach for all four constructs, consistent with the theoretical basis of each scale. Discriminant validity was confirmed via Heterotrait-Monotrait (HTMT) ratios ranging from 0.301 to 0.560, all below the conservative threshold of 0.85 (Voorhees et al., 2016). To address potential common method bias, given that all data were collected via a single self-reported survey, Harman's single-factor test was conducted. The single factor accounted for 28.4% of the total variance, well below the 50% threshold, suggesting that common method bias is unlikely to be a serious concern in this study (Podsakoff et al., 2003).

4.2 Measurement Model Assessment

In Table 3, the reliability and convergent validity measures for the measurement model are presented. All measurement items exceeded 0.70 (Hair et al., 2017) on their item loadings (0.824 to 0.89), which indicates that all measurement items are significant contributors to

Table 2 Demographic Characteristics (N = 280)

Variable	Category	Frequency	Percentage
Gender	Male	128	45.7%
	Female	152	54.3%
Age	18-25	62	22.1%
	26-35	58	20.7%
	36-45	87	31.1%
	46 +	73	26.1%
	High school	85	30.4%
Education	Undergraduate	126	45.0%
	Master's degree	38	13.6%
	Doctorate	31	11.1%

Table 3 Construct Reliability and Validity

Constructs and items		Loadings	Cronbach's alpha	Rho_A	CR	AVE
AI personalization	AIP1	0.874	0.829	0.830	0.897	0.745
	AIP2	0.852				
	AIP3	0.863				
Privacy concerns	PC1	0.883	0.858	0.862	0.914	0.779
	PC2	0.879				
	PC3	0.886				
Trust	TR1	0.867	0.827	0.836	0.897	0.743
	TR2	0.890				
	TR3	0.828				
Consumer engagement	CE1	0.880	0.814	0.817	0.890	0.729
	CE2	0.857				
	CE3	0.824				

the constructs they are measuring. The average variance extracted (AVE) value for each construct was greater than 0.50 (0.729 to 0.779), indicating that each construct accounts for a substantial amount of variance from its respective indicator. The composite reliability (CR) values also exceed 0.70 (0.890 to 0.914), which demonstrates that there is convergent validity for the constructs (Fornell & Larcker, 1981). The Cronbach's alpha value for each construct was between 0.814 and 0.858, indicating that all measurement constructs were internally consistent. Therefore, results indicate that all the scales used in this study demonstrated strong reliability and convergent validity.

The HTMT ratio, which is a measure used to evaluate the distinctiveness of constructs according to Voorhees et al. (2016), was used to assess discriminant validity. The HTMT values for this study were between 0.301 and 0.560, all of which were less than the typical criteria of 0.85 or 0.9. As a result, the latent constructs were shown to be distinct, providing satisfactory evidence of discriminant validity within the measurement model (Table 4).

4.3 Structural Model Assessment

Multiple criteria have been used to determine whether the structural model fits the data set; one of these criteria is the standardized root mean square residual (SRMR), which is used to evaluate the fit of a model by assessing the difference between the observed correlation matrix and the correlation matrix predicted by the model. According to the SRMR, as outlined by Hair et al. (2017), a score below 0.08 indicates acceptable fit. The SRMR test for the structural model revealed a value of 0.056, indicating that the model fits the review dataset.

The next step in evaluating explanatory power is through reviewing the proportion of variance explained, which was determined by using the coefficient of determination (R^2). The model explains approximately 44.7% of the variance in consumer engagement ($R^2 = 0.447$). By other, previously established criteria, model explanatory power represents moderate levels of explanatory ability comparable to results from previously conducted research using partial least squares structural equation modeling methodology.

Table 4 Heterotrait-Monotrait Ratio

	AI personalization	Privacy concerns	Trust	Consumer engagement
AI personalization				
Privacy concerns	0.049			
Trust	0.030	0.054		
Consumer engagement	0.483	0.350	0.560	

To assess the relative contribution of each predictor variable to the endogenous variable, the size of the effect (f^2) was considered. The results indicated that Personalization via AI ($f^2 = 0.255$) and privacy concerns ($f^2 = 0.151$) have a medium-sized effect on consumer engagement. However, Trust demonstrated a relatively strong effect size for consumer engagement ($f^2 = 0.383$) and is therefore an important variable in the structural model described.

Overall, the model was a good fit and provided sufficient explanatory power to predict Consumer Engagement. Figure 2 illustrates the results of the structural relationships.

The structural model and hypothesis testing results are summarized in Table 5. The study's overall conclusion is that all proposed hypotheses were supported because all p-values were less than the recommended level of significance (0.05).

As demonstrated through the results, AI Personalization significantly and positively affects Consumer Engagement ($\beta = 0.376$, $t = 8.949$, $p < 0.001$), thus supporting hypothesis H1. The conclusion reached as a result of this study's findings is that increased levels of personalization due to AI drive higher levels of consumer engagement on digital platforms supporting medical tourism.

Conversely, Privacy Concerns significantly and negatively affect Consumer Engagement ($\beta = -0.289$, $t = 6.303$, $p < 0.001$), thereby confirming hypothesis H2. This finding suggests that if individuals have significant concerns about their personal data and/or the handling thereof, they may be less willing to engage with an AI-enabled digital service.

Trust has been found to have the highest positive impact on Consumer Engagement ($\beta = 0.460$, $t = 11.337$, $p < 0.001$), thereby supporting hypothesis H3. The strong degree of trust within this relationship highlights the critical role that trust plays in facilitating and enhancing consumer interaction and engagement within AI-enabled health care

and medical tourism settings.

Overall, the results indicate how valuable personalized AI can be to drive engagement, as well as how important consumer trust is for consumer engagement in the context of digital healthcare, while at the same time highlighting the inhibiting effect of privacy concerns on the digital healthcare context.

4.4 Discussion

The primary findings of this study demonstrate strong empirical evidence of the impact that AI personalization, privacy concerns, and trust have on consumer engagement in the context of digital healthcare. The structural model results indicate that consumer engagement is positively impacted by AI personalization, while consumer engagement is negatively impacted by privacy concerns. Finally, trust is found to be the most powerful predictor of consumer engagement, supporting the critical role of trust in AI-enabled healthcare environments.

The present study makes a distinct theoretical contribution by integrating three complementary frameworks—the TAM, PCT, and S-O-R model—into a unified explanatory structure applied to AI-driven personalization in medical tourism. While prior studies have examined these constructs in isolation or within general digital health contexts, this study is among the first to empirically test their joint explanatory power in the medical tourism sector. The findings advance existing knowledge by demonstrating that trust does not merely mediate the personalization-engagement relationship, but functions as a psychological buffer that recalibrates consumers' privacy calculus in favor of engagement—a dynamic with direct implications for AI system design and healthcare marketing strategy.

These findings demote that trust functions not merely as an antecedent but as a psychological buffer that attenuates the negative effect of privacy concerns on engagement. This aligns with PCT, wherein consumers engage in cost-benefit evaluations. However, the present results

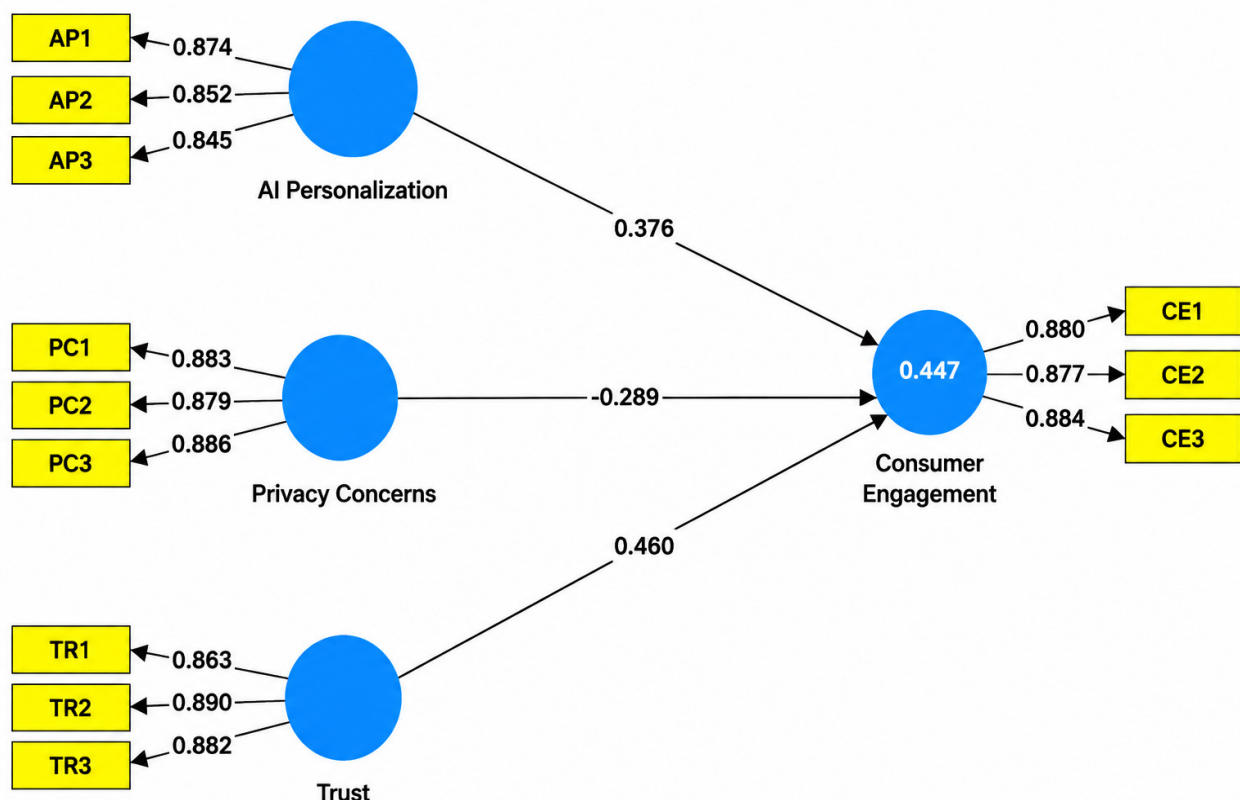


Figure 2 Results of the Path Analysis

Table 5 Structural Model Results

Hypothesis	Path	Effect (β)	Value (t)	Values (p)	Remarks
H1	AI personalization $\rightarrow$ consumer engagement	0.376	8.949	0.000	Supported
H2	Privacy concerns $\rightarrow$ consumer engagement	-0.289	6.303	0.000	Supported
H3	Trust $\rightarrow$ consumer engagement	0.460	11.337	0.000	Supported

suggest that trust recalibrates this calculus in favor of engagement even under elevated privacy sensitivity—a dynamic particularly salient in healthcare contexts where data vulnerability is heightened.

According to the TAM, AI personalisation positively impacts consumer engagement by enhancing their perception of usefulness and enhancing the experience of making selections. Within the context of medical tourism, consumers must analyse complex medical data, evaluate international healthcare providers, and make high-stakes decisions based on both actual data and uncertainty. By providing relevant recommendations, customised communication, and tailored service offerings, AI personalisation reduces consumers' overload of data. The positive path coefficient ($\beta = 0.376$, $p < 0.001$) indicates that consumers will increase their level of active engagement with digital medical tourism services when AI technology provides them with relevant information in a timely, context-aware manner.

Conversely, the results demonstrate that the significant negative relationship ($\beta = -0.289$, $p < 0.001$) between concerns about privacy and consumer engagement validates PCT, which contends that consumers weigh the advantages of digital interactions against the disadvantages (Dinev & Hart, 2006; Malhotra et al., 2004). In the context of medical tourism, concern over the collection and use of consumers' personal data, including medical records, unauthorized access to data, and monitoring of consumers are particularly relevant. The results support earlier work indicating medical information is one of the most private types of individual information (Angst & Agarwal, 2009). Thus, while AI can improve the quality of services and ease of use, consumers will be reluctant to use them if they do not feel they have sufficient control over their health information.

The predictor with the strongest influence over consumer engagement is trust ($\beta = 0.460$, $p < 0.001$), highlighting its importance in the digital ecosystem for health care. Additionally, this finding supports earlier research, indicating that trust serves as an important psychological mechanism to decrease uncertainty and lessen the perception of technological risk (Featherman & Pavlou, 2003). Additionally, in both the extended TAM theory and the S-O-R model, trust functions as a central organism-level evaluative state that directly translates technological stimuli into positive behavioural outcomes—a role theoretically consistent with the S-O-R framework's organism component, even when formal mediation is not separately tested (Mehrabian & Russell, 1974; Venkatesh & Davis, 2000). Therefore, consumers will be more likely to engage with AI-serviced systems if the medical tourism platforms that provide services are trustworthy, transparent, and secure, despite the perception of risk to their health information.

The research collectively shows that the degree to which AI-driven medical tourism services provide privacy as opposed to individualized services is a major factor influencing consumer engagement with these services. Increased consumer satisfaction from tailored services is offset by decreased consumer satisfaction from privacy violations and privacy-related concerns, which result in reduced participation in digital health care services. To address this dichotomy, the research findings indicate that trust works to balance the tradeoff between personalization and privacy when consumers use AI technology for cross-border health care.

The findings of this study also add to the growing body of literature in relation to AI adoption in both health care and medical tourism by developing an empirical framework for AI adoption using the TAM, PCT, and the S-O-R model of buyer behaviour.

The findings further extend the existing literature on AI by providing an integrated theoretical framework which identifies how technological advantages, perceived privacy-related disadvantages, and consumer trust converge to determine consumer use of AI in cross-border digital health care settings.

5. CONCLUSION

The research examined the effects of AI-based digital marketing technology on consumer involvement within the healthcare tourism market, including the impact of AI personalization, privacy concerns, and trust. The study used three theories, where the TAM, PCT, and the S-O-R framework created an integrated model of consumer involvement in healthcare activities that can be successfully implemented through AI-based technologies.

The results of the study show that AI personalization greatly improves consumer engagement, which means that digital experiences that offer personalized options are much more relevant, efficient, and usable for consumers when using healthcare tourism platforms. AI allows for successful construction of personalized recommendations to help guide individuals through the often-complex decision-making process when seeking medical attention and also enables individuals to develop a stronger relationship with the business that provides the medical solution through AI-enabled technology.

On the contrary, privacy concerns have a significant negative impact on consumer involvement, reflecting the lack of public confidence regarding data security, surveillance, and how personal medical information may be used or misused in AI-based healthcare. However, trust was found to have the strongest positive influence on consumer involvement, thus, indicating the importance of trust as it reduces uncertainty among individuals and promotes consumers' utilization and engagement with AI-enabled technologies.

From a theoretical standpoint, the current research adds to the expanding knowledge base of literature concerned with AI Adoption and Digital Healthcare Marketing by providing a cohesive means of understanding the relationship between these two concepts through an integrated model involving the TAM, PCT, and S-O-R Framework. The research supports the assertion that consumer participation in Medical Tourism is influenced not only by the technological capabilities of the provider but also by the consumer's assessment of privacy risk and reliability. As a result, this study enhances previous research that examined AI-driven personalization by identifying trust as an essential variable connecting a consumer's interaction with a provider through technology and a consumer's subsequent behaviour in privacy-sensitive healthcare situations.

From a managerial standpoint, the study findings indicate that medical

tourism providers and digital healthcare marketers should transition from solely technology-related methods of operation and adopt trust-based methodologies with regard to the implementation and management of data collection practices. While AI personalisation has the potential to significantly enhance a consumer's experience and level of engagement, organisations must also ensure transparency in the data collection process and how that data will be used, employ sound cyber security protections against data breaches, and clearly communicate their privacy policies to consumers. The development of a trustworthy AI ecosystem is thus fundamental for building long-term relationships with Consumers and encouraging sustained engagement with digital healthcare services.

The main points of the study demonstrate that an existing privacy-personalization dilemma exists in AI-enabled medical tourism systems. The value created for consumers through personalization technologies is great. However, responsiveness to privacy preferences will lessen engagement levels unless sufficient trust is cultivated. Additionally, future success and sustainability of AI-enhanced medical tourism ecosystems will require organizations to appropriately balance both personalized digital experiences and good privacy protection practices and trust in their use of AI.

5.1 Theoretical contribution

This research provides multiple contributions toward the fields of AI-enhanced digital marketing, as well as to the phenomenon of medical tourism through its connections made with TAM, PCT, and the S-O-R framework by synthesizing various streams of literature into one model that demonstrates how technological advantages, perceived privacy risks, and psychological trust all work together in influencing consumer interactions within AI-empowered healthcare systems. By broadening our understanding of how technological advantages, perceived privacy risks, and psychological trust work together to influence consumer behaviour, this work will significantly contribute to the literature on AI-enabled personalised marketing in medical tourism.

This study further adds empirical evidence to the growing area of research on the impact of AI-driven personalisation in medical tourism by clearly illustrating how AI-driven personalisation leads to increased consumer participation, whereas consumer participation decreases due to privacy issues. These findings provide insight into ongoing discussions around the privacy-personalisation paradox as it relates to providing personalised digital health care services.

Finally, these findings identify that trust is the greatest predictor of consumer engagement with AI technologies; thus, trust serves as a psychological mechanism that reduces uncertainty and helps facilitate acceptance of AI-based products and services within the healthcare space. In turn, this study advances the existing body of knowledge surrounding the behaviors of those who use AI technology within privacy-sensitive healthcare environments.

5.2 Managerial Implications

The results from the study offer multiple practical suggestions/implications for digital healthcare marketers, medical tourism suppliers, and healthcare technology providers across the globe. Based on the positive impact AI personalization has on consumer engagement, it would benefit all organizations to invest in AI-powered systems that provide consumers with customized recommendations and/or targeted communications as well as user-centred digital experiences through these types of systems. Implementing these types of strategies could help make patient decision-making processes more efficient while also increasing the level of consumer interaction and engagement with the medical tourism organisations that are providing the services on the respective platforms.

The findings also showed that there is a negative impact of privacy concerns, so organisations must employ added data protection and privacy management systems for their healthcare platforms. All organisations should implement transparent data use policies and practices along with obtaining user consent in order to safeguard sensitive medical information from being misused.

Trust was determined to be the strongest influencer of consumer engagement, so managers need to focus on trust-building strategies within AI-powered healthcare platforms. Providing verified information, being transparent about how AI operates, using ethical data practices, and displaying overall institutional credibility can enhance the levels of confidence of users and increase long-term levels of engagement.

Medical tourism platforms and facilitators should adopt transparent data practices by clearly disclosing what patient data is collected, how it is processed, and with whom it is shared across borders. Explainable AI mechanisms should be integrated into recommendation engines so that patients understand why specific hospitals, procedures, or destinations are suggested to them. Consent management systems—including granular opt-in/opt-out controls for behavioral and medical data—should be embedded at every touchpoint of the patient journey. Cross-border healthcare providers must comply with destination-country data protection regulations (e.g., the General Data Protection Regulation (GDPR) and the Personal Data Protection Act (PDPA)) and communicate this compliance visibly to international patients. Digital marketing providers serving medical tourism clients should prioritize privacy-preserving personalization techniques, such as federated learning or on-device processing, to reduce the exposure of sensitive health information while maintaining recommendation quality.

In conclusion, this study indicates that the successful implementation of AI technologies in the medical tourism environment must balance the benefits of personalisation with providing privacy protection to users while also creating trust for creating long term use among users.

5.3 Limitations of the Study and Directions of Future Research

This study has contributed to our knowledge about the role of AI-focused digital marketing within medical tourism. However, there are some limitations that will need to be addressed in any future studies.

Firstly, limitation relates to the fact that the data were gathered from respondents at a single moment in time, meaning that the researchers will not be able to ascertain whether there is a causal link between any two of the variables measured during the study or how customer perceptions have evolved over time. Research into trust, privacy and engagement in relation to the provision of healthcare using AI technologies is all evolving as customers use the same digital platform over time and therefore require longitudinal research designs to capture the relationship between trust development and privacy perceptions in AI-enabled healthcare systems over time (Creswell & Creswell, 2018).

Secondly, because this study was conducted based on respondents who were all recruited using a non-probabilistic sampling method from only the Indian medical tourism market, and lastly, while India is one of the leading providers of medical tourism services in the world, the results from this study cannot be presumed consistent across cultures and geographic areas. Future studies should improve the external validity of their findings using a probabilistic sampling method and provide cross-comparative analysis against the major medical tourism markets, such as the Gulf Cooperation Council, South-East Asia and Africa. (Hair et al., 2019).

Thirdly, the study assessed a small number of factors, including AI-driven personalization, concerns about privacy, trust, and engagement as a consumer. However, some of the variables that may also potentially influence behaviours concerning personalisation of products and services include digital literacy, perceived risk, anxiety towards technology, cultural orientation, and past use of AI technology. Therefore, future research will look to explore additional factors, including the moderating influence of digital literacy in determining the relationship between personalised products and services and privacy (Vesanen, 2007).

Fourthly, the study used a quantitative methodology, which may not fully account for the more complex cognitive structures and emotions that impact the privacy-personalisation paradox in making decisions about health care. Consequently, future research should consider using qualitative or mixed-method approaches such as in-depth interviews, focus groups, and case studies to provide additional interpretive data

regarding the experiences and how consumers experience AI-enabled health care platforms (Yin, 2018).

The fast-paced growth of AI is a limitation for this study due to the ongoing changes in AI applications, namely generative AI, and an explosion of large language models, which have drastically changed the way we communicate and receive services from the healthcare sector. Therefore, it is likely that the results of this study will need to be reevaluated when AI applications are more independent, interactive, and capable of providing reasoning. Subsequent studies should look at how consumer trust and privacy perceptions are affected by algorithmic transparency and explainability within the context of AI-driven healthcare settings (Rust & Huang, 2021).

This study also did not specifically address the effect of regulatory and legal structures on consumer perceptions and behaviour. As there are significant differences between privacy protection regulations as well as consumer engagement through regulations, it is recommended to conduct future cross-regulatory comparison studies to understand how institutional governance instruments impact trust-building and privacy perceptions of consumers in the provision of cross-border medical tourism. More specifically, a comparative analysis of the digital PDPA in India and the GDPR in the European Union will yield relevant insight into the relationship between the regulatory environment and platform trustworthiness.

CONFLICT OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest regarding the publication of this article. The research was conducted independently and was not influenced by any financial, commercial, or personal relationships that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS

The authors confirm sole responsibility for all aspects of the study, including conceptualization of the research framework, literature review, data collection, statistical analysis, interpretation of results, and manuscript preparation. The entire research process from design to final submission was carried out independently.

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DATA AVAILABILITY STATEMENT

The data used in this study were collected through a structured survey and are available from the author upon reasonable request, subject to ethical and privacy considerations.

ETHICAL STATEMENT

The study involved human participants who responded voluntarily to an anonymous survey. Informed consent was obtained from all respondents prior to participation. The study did not involve any intervention or clinical procedures, and all data were analyzed in aggregated form to ensure confidentiality and privacy.

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