

Consumer Adoption of AI-Powered Healthcare Product Recommendations: Examining Trust and Purchase Intention in Uttarakhand

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Abstract

Artificial Intelligence (AI) is increasingly influencing online shopping by providing personalized product recommendations based on consumer preferences and behavior. Its application to healthcare products is particularly important because consumers may consider issues of reliability, safety, privacy and product suitability before accepting an automated recommendation. This study examines the adoption of AI-powered healthcare product recommendations among consumers in Uttarakhand, with particular emphasis on trust and purchase intention. The study considers perceived usefulness, personalization, information quality, perceived risk and privacy concern as factors that may influence consumer trust. Trust is further examined as a potential determinant of purchase intention. A quantitative research approach is proposed, using a structured questionnaire among consumers who have experience with online healthcare product searches or purchases. The study is expected to contribute to the growing literature on AI and consumer behavior by examining healthcare product recommendations from a regional perspective. It may also provide useful implications for online healthcare retailers and AI developers seeking to improve transparency, reliability and consumer confidence.

Keywords: Artificial Intelligence, Healthcare Products, Recommendation Systems, Trust, Purchase Intention, Consumer Behavior, Uttarakhand

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1. Introduction

Artificial Intelligence has become an increasingly visible part of digital commerce. Online platforms use AI to analyze consumer behavior, identify preferences and recommend products that may be relevant to individual users. Recommendation systems have consequently changed the traditional online shopping process. Instead of searching through a large number of alternatives independently, consumers can receive suggestions generated according to their previous searches, browsing behavior, purchases and stated preferences.

The use of AI recommendations in healthcare-related shopping deserves particular attention. Consumers increasingly purchase healthcare and wellness products through online platforms, including health-monitoring devices, nutritional products, personal healthcare equipment and wellness products. AI can

simplify the search process by presenting products that appear relevant to the consumer's requirements. This may reduce search time and information overload.

However, healthcare products differ from many conventional consumer products. Consumer purchasing clothing or household goods may tolerate an unsuitable recommendation with relatively limited consequences. A healthcare-related purchase can involve concerns about safety, effectiveness, suitability and personal wellbeing. Consumers may therefore be more cautious when an AI system recommends a healthcare product.

Trust becomes important under these circumstances. Consumers generally cannot see how an AI algorithm reaches a recommendation. They may not know which information has influenced the suggestion or whether commercial interests have affected the

recommendation. They must therefore form an opinion about whether the system is reliable, competent and trustworthy.

Personalization can strengthen the perceived value of AI recommendations. When recommendations appear relevant to a consumer's preferences, the system may be considered more useful. However, personalization can also generate privacy concerns. Consumers may question how the platform obtained information about their interests and how that information will be used.

Information quality is another important consideration. Consumers may be more willing to trust a recommendation when product descriptions are accurate, clear and complete. In contrast, unclear or incomplete information can increase uncertainty and reduce confidence in the recommendation.

Perceived risk may also influence consumer responses. Consumers can perceive financial, functional, privacy or health-related risks when considering an AI-recommended healthcare product. Higher perceived risk may encourage consumers to seek information from alternative sources before purchasing.

The Indian environment provides an important context for studying these relationships. Digital commerce has expanded considerably, while AI-enabled services are becoming increasingly familiar to consumers. At the same time, healthcare decisions continue to involve human sources of trust, including doctors, pharmacists, family members and personal experience. AI recommendations therefore operate alongside existing forms of consumer decision-making.

Uttarakhand provides a distinctive regional setting for examining this issue. Consumers in the state differ in terms of geographical location, digital exposure, education, income and online shopping experience. Consumers in urban areas may have greater exposure to AI-enabled platforms, while those in smaller towns may have different experiences and levels of confidence in digital technologies.

The present study consequently focuses on the relationship between AI recommendation characteristics, trust and purchase intention among consumers in Uttarakhand. It does not treat an AI recommendation as medical advice. Instead, the study examines AI as a digital tool that assists consumers in discovering and evaluating healthcare products.

2. Objectives of the Study

The study has the following objectives:

1. To examine consumer awareness and exposure to AI-powered healthcare product recommendations in Uttarakhand.
2. To examine the influence of perceived usefulness on consumer trust.
3. To determine whether personalization influences trust in AI-powered healthcare recommendations.
4. To examine the effect of information quality on consumer trust.
5. To determine the relationship between perceived risk and trust.
6. To examine the influence of privacy concerns on consumer trust.
7. To determine the effect of consumer trust on purchase intention.
8. To examine whether trust mediates the relationship between AI recommendation characteristics and purchase intention.

3. Research Questions

The study seeks to answer the following questions:

RQ1: What is the level of consumer awareness of AI-powered healthcare product recommendations in Uttarakhand?

RQ2: Does perceived usefulness influence consumer trust in AI recommendations?

RQ3: Does personalization influence trust?

RQ4: Does information quality influence trust?

RQ5: Do perceived risk and privacy concerns negatively affect trust?

RQ6: Does consumer trust influence purchase intention?

RQ7: Does trust mediate the relationship between AI recommendation characteristics and purchase intention?

4. Review of Literature

4.1 Artificial Intelligence and Consumer Behavior

AI has changed the way consumers interact with digital platforms. Recommendation systems are among the most common applications because they allow platforms to analyze large amounts of consumer information and identify products that may match individual preferences.

From a consumer perspective, recommendations can reduce search effort and make product selection easier. However, recommendation quality alone does not guarantee acceptance. Consumers may reject suggestions if they appear irrelevant, inaccurate or commercially motivated.

The growing sophistication of AI means that recommendations can become increasingly personalized. This creates both an opportunity and a challenge. Greater relevance may improve consumer experience, while increased use of personal data may create concerns regarding privacy and transparency.

4.2 AI in Healthcare-Related Consumption

Healthcare is one of the areas in which AI has received considerable attention. Research has examined AI in diagnosis, treatment support, healthcare chat bots, health information and medical decision-making. More recently, AI has also become relevant to consumer-facing healthcare services.

AI-powered product recommendations represent a different form of healthcare application. Here, the technology does not necessarily diagnose a condition or prescribe treatment. Instead, it assists consumers in identifying products available through digital marketplaces.

This distinction is important because consumers may perceive such systems primarily as shopping tools. Nevertheless, the healthcare-related nature of the products means that trust and perceived risk can be more important than in ordinary online retail.

4.3 Trust in AI

Trust is commonly associated with a willingness to rely on a system despite uncertainty. In AI-based environments, trust may depend on perceived competence, reliability, transparency and consistency.

Consumers often cannot independently evaluate the technical functioning of an AI algorithm. Instead, they may judge it based on the quality of its

recommendations and their previous experiences. A system that repeatedly provides relevant suggestions may gradually develop credibility, whereas repeated errors may reduce confidence.

Trust is particularly important in healthcare because consumers may perceive a higher cost of making an inappropriate decision. If consumers believe that an AI recommendation could potentially be unsuitable, they may require stronger evidence before accepting it.

4.4 Perceived Usefulness

Perceived usefulness refers to the extent to which consumers believe that a technology improves their ability to complete a particular task.

In AI-powered healthcare product shopping, usefulness may be reflected in the ability of the recommendation system to reduce search time, identify relevant alternatives and simplify comparison.

A consumer who finds an AI system useful may be more willing to interact with it and consider its recommendations. Usefulness can therefore contribute to positive evaluations of the system and may strengthen trust and purchase intention.

4.5 Personalization

Personalization refers to the extent to which recommendations are adapted to an individual's interests, preferences or previous behavior.

Consumers may value personalized recommendations because they reduce the number of irrelevant products presented to them. A recommendation that appears specifically suited to a consumer's requirements can create a perception that the AI system understands the consumer.

However, personalization also raises questions about data usage. A consumer may appreciate relevant suggestions while wondering why the platform possesses information about their interests. Thus, personalization and privacy can operate simultaneously as benefits and concerns.

The effect of personalization on trust may consequently depend on whether consumers believe that the use of their information is appropriate and transparent.

4.6 Information Quality

Information quality concerns the accuracy, completeness, relevance and clarity of information available to consumers.

In healthcare product purchasing, information quality can have a strong influence on confidence. Consumers may want to know product characteristics, intended use, instructions, limitations, reviews and other relevant details before making a purchase.

An AI recommendation supported by clear and reliable information may be perceived as more credible. Conversely, incomplete or contradictory information can increase uncertainty.

Information quality is therefore expected to have a positive relationship with trust and purchase intention.

4.7 Perceived Risk

Perceived risk represents the consumer's expectation of possible negative consequences associated with a decision.

For healthcare products, perceived risk can involve concerns about financial loss, product effectiveness, suitability or potential health consequences. The level of perceived risk may differ according to the type of product and the consumer's familiarity with it.

When risk is high, consumers may be less willing to rely on AI recommendations alone. They may search for independent information or consult healthcare professionals before making a purchase.

Perceived risk is therefore expected to have a negative relationship with trust and purchase intention.

4.8 Privacy Concern

Privacy is an important issue in AI-based recommendation systems because personal data can be used to improve recommendation accuracy.

Consumers may be concerned about the collection, storage and use of information generated through searches and online behavior. These concerns may

become stronger when the information relates to healthcare interests.

A consumer who believes that personal information is not adequately protected may be unwilling to rely on AI recommendations, even when the recommendations are useful. Privacy concern is therefore expected to weaken consumer trust.

4.9 Purchase Intention

Purchase intention refers to a consumer's willingness or likelihood of purchasing a product.

In this study, purchase intention specifically refers to the intention to purchase a healthcare product recommended by an AI-powered system.

A recommendation may attract attention without necessarily producing purchase intention. Consumers may still compare prices, read reviews, seek professional advice or examine alternative products. Trust is therefore expected to play an important role in converting a recommendation into a purchasing intention.

When consumers perceive the AI system as reliable and the recommendation as relevant, they may become more willing to consider the recommended product.

5. Research Gap

Existing literature provides considerable knowledge regarding AI adoption and healthcare technology. However, most studies focus on applications such as healthcare chat bots, diagnosis, treatment support or AI-generated health information.

Comparatively less attention has been given to **AI-powered healthcare product recommendations as a consumer purchasing mechanism**. The distinction is important because the consumer is not merely using AI; the consumer is evaluating an AI-generated suggestion and deciding whether to purchase a healthcare-related product.

A second gap concerns the role of trust. Although trust is widely recognized as an important factor in AI adoption, fewer studies examine it as a mechanism connecting perceptions of AI recommendations with purchase intention.

A third gap is geographical. Research on AI and digital consumer behavior in India is expanding, but regional evidence from Uttarakhand remains limited.

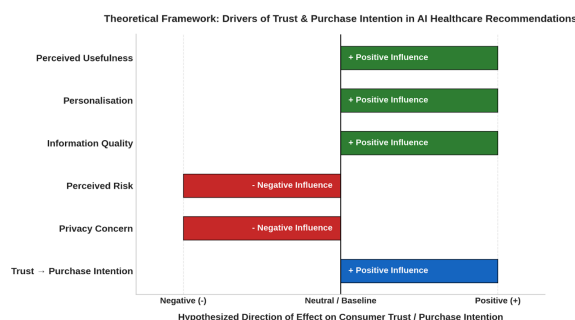
The present study attempts to address these gaps by examining the relationships among perceived usefulness, personalization, information quality, perceived risk, privacy concern, trust and purchase intention in the Uttarakhand context.

6. Conceptual Framework

The study proposes that consumers evaluate AI-powered healthcare product recommendations through both positive and negative perceptions.

Perceived usefulness, personalization and information quality are expected to contribute positively to trust. Perceived risk and privacy concern are expected to reduce trust. Trust is then expected to influence purchase intention.

The proposed relationship is:



Source: Own framework based on the literature.

The model assumes that trust acts as a central psychological link. A consumer may recognize that AI recommendations are convenient but may still avoid purchasing a recommended healthcare product if the system is not considered trustworthy.

7. Hypotheses

H1: Perceived usefulness has a significant positive effect on consumer trust.

H2: Personalization has a significant positive effect on consumer trust.

H3: Information quality has a significant positive effect on consumer trust.

H4: Perceived risk has a significant negative effect on consumer trust.

H5: Privacy concern has a significant negative effect on consumer trust.

H6: Consumer trust has a significant positive effect on purchase intention.

H7: Perceived usefulness has a significant positive effect on purchase intention.

H8: Personalization has a significant positive effect on purchase intention.

H9: Information quality has a significant positive effect on purchase intention.

H10: Perceived risk has a significant negative effect on purchase intention.

H11: Privacy concern has a significant negative effect on purchase intention.

H12: Consumer trust mediates the relationship between AI recommendation characteristics and purchase intention.

8. Brief Research Method

The study will use a quantitative, cross-sectional research design. The target population will consist of adult consumers residing in Uttarakhand who have experience with online healthcare product searches or purchases.

Primary data will be collected using a structured questionnaire. A five-point Likert scale ranging from **1 = Strongly Disagree** to **5 = Strongly Agree** may be used to measure the major constructs.

Purposive sampling may be adopted because respondents should have sufficient exposure to online shopping and AI-based recommendations. A sample of approximately 300–400 respondents may be targeted, subject to actual availability of respondents.

The questionnaire will measure perceived usefulness, personalization, information quality, perceived risk, privacy concern, trust and purchase intention. Demographic information may also be collected to describe the sample.

The collected data may be analyzed through descriptive statistics, reliability testing, correlation and regression analysis. Mediation analysis may subsequently be used to determine whether trust explains the relationship between AI recommendation characteristics and purchase intention.

9. Research Methodology

9.1 Research Design

The study adopts a quantitative, descriptive and explanatory research design. A quantitative approach is appropriate because the study examines measurable relationships among perceived usefulness, personalization, information quality, perceived risk, privacy concern, trust and purchase intention. The explanatory component helps determine whether these factors significantly influence consumer trust and purchasing intention.

The study follows a cross-sectional approach, in which information is collected from respondents during a defined period. The research focuses on consumers residing in Uttarakhand who have experience with online healthcare product searches, online purchases or AI-generated product recommendations.

9.2 Population and Sampling

The target population consists of adult consumers in Uttarakhand who use digital platforms for shopping and have some exposure to healthcare or wellness products available online. Respondents may belong to different age groups, educational backgrounds, income categories and residential locations.

Purposive sampling is considered suitable because respondents need to have some familiarity with online shopping and AI-based recommendations. A target sample of approximately 300 respondents may be considered adequate for the proposed statistical analysis. Data can be collected through online questionnaires as well as direct responses where appropriate.

The study should attempt to include respondents from different parts of Uttarakhand so that the findings do not represent only one urban consumer group.

9.3 Data Collection

Primary data will be collected through a structured questionnaire. The questionnaire will contain questions relating to demographic characteristics, online healthcare shopping behavior, exposure to AI recommendations and perceptions of AI-powered healthcare product recommendations.

A five-point Likert scale will be used for the main statements, ranging from **1 = Strongly Disagree** to **5 = Strongly Agree**. Secondary information will be obtained from published research articles, books, reports and credible institutional sources.

9.4 Variables of the Study

The dependent variable is **purchase intention**. Consumer **trust** is treated as the principal mediating variable. Perceived usefulness, personalization, information quality, perceived risk and privacy concern are the major explanatory variables.

Table 1. Variables and Measurement Dimensions

Variable	Measurement focus
Perceived usefulness	Convenience, time saving, easier product search and decision support
Personalization	Relevance of recommendations and matching individual preferences
Information quality	Accuracy, clarity, completeness and relevance of product information
Perceived risk	Concerns regarding unsuitable products, financial loss and possible negative consequences
Privacy concern	Concerns regarding collection and use of personal information
Trust	Reliability, competence, confidence and willingness to rely on AI
Purchase intention	Willingness and likelihood of purchasing AI-recommended healthcare products

10. Questionnaire Development

The questionnaire is designed to measure the constructs included in the conceptual framework. Statements are framed in simple language so that respondents from different educational backgrounds can understand them.

For **perceived usefulness**, respondents may be asked whether AI recommendations save time, simplify

product searches and assist them in comparing healthcare products.

For **personalization**, questions may examine whether recommendations appear relevant to individual needs and preferences.

For **information quality**, respondents may evaluate the accuracy, clarity and completeness of information provided with AI recommendations.

For **perceived risk**, statements may examine concerns about unsuitable recommendations, incorrect information and possible negative consequences.

For **privacy concern**, respondents may indicate their level of concern about the collection and use of their personal information.

Trust items will measure whether consumers consider AI recommendations reliable, dependable and worthy of confidence.

Finally, purchase intention items will measure whether consumers would consider purchasing a healthcare product recommended by AI.

11. Data Analysis Techniques

The collected data will be analyzed systematically.

First, descriptive statistics such as frequency, percentage, mean and standard deviation will be used to describe respondents and their perceptions.

Second, reliability analysis will be performed to determine the internal consistency of the questionnaire. Cronbach's alpha may be used, with an alpha value of approximately 0.70 or above generally considered acceptable for established scales.

Third, correlation analysis will be used to examine the direction and strength of relationships between the major variables.

Regression analysis will then be used to determine whether perceived usefulness, personalization, information quality, perceived risk and privacy concern significantly predict trust and purchase intention.

Finally, mediation analysis will examine whether trust acts as an intermediate mechanism between the explanatory variables and purchase intention.

A significance level of **5% ($p < 0.05$)** may be used for hypothesis testing.

12. Proposed Data Interpretation

The empirical analysis should begin with a description of the respondents. Variables such as age, gender, education, income, place of residence and frequency of online shopping can provide an understanding of the sample.

The next stage should examine consumers' exposure to AI recommendations. This is important because respondents who frequently encounter AI-generated recommendations may have different levels of trust from consumers with limited exposure.

Mean scores can then be calculated for each major construct. Higher scores for perceived usefulness, personalization and information quality would indicate positive consumer perceptions. Higher scores for perceived risk and privacy concern would indicate greater apprehension.

The correlation matrix can provide an initial indication of whether trust is positively related to usefulness, personalization and information quality and negatively related to risk and privacy concerns.

Regression analysis can provide stronger evidence regarding the explanatory power of these variables. If trust significantly predicts purchase intention, the study would provide support for the central argument that consumer confidence is an important factor in AI-supported healthcare purchasing.

13. Reliability and Validity

Reliability refers to the consistency of the measurement instrument. If several questionnaire items are intended to measure the same construct, they should produce reasonably consistent responses.

Cronbach's alpha can be calculated separately for perceived usefulness, personalization, information quality, perceived risk, privacy concern, trust and purchase intention.

Validity concerns whether the questionnaire actually measures the concepts it is intended to measure. Content validity can be strengthened by developing questionnaire items from established literature and obtaining expert feedback before final data collection.

A pilot test with a small group of respondents can also identify unclear or ambiguous questions. Necessary modifications should be made before conducting the final survey.

14. Expected Relationships among Variables

The proposed model assumes that perceived usefulness will increase trust because consumers are more likely to value a system that makes healthcare product searching easier.

Personalization is expected to strengthen trust when consumers perceive recommendations as relevant to their needs. Information quality is similarly expected to improve confidence because accurate and understandable information reduces uncertainty.

In contrast, perceived risk is expected to weaken trust. Consumers who believe that an AI recommendation may be unsuitable may hesitate to rely on it.

Privacy concern is also expected to reduce trust because consumers may be uncomfortable with the use of personal information for recommendation purposes.

Trust is finally expected to have a positive effect on purchase intention. Consumers who consider AI recommendations reliable should be more willing to consider purchasing the recommended product.

15. Ethical Considerations

Participation in the study should be voluntary. Respondents should be informed about the academic purpose of the research before completing the questionnaire.

The survey should not require unnecessary personal health information. Responses should remain confidential, and personally identifiable information should not be reported in the research paper.

The study should also clearly communicate that AI-powered product recommendations are not equivalent

to professional medical advice. Consumers should make healthcare decisions responsibly and consult qualified healthcare professionals when necessary.

16. Limitations of the Proposed Method

The study may face several limitations. First, purposive sampling may restrict the generalisability of the findings to the entire population of Uttarakhand. Second, self-reported responses may be influenced by individual perceptions and social desirability.

Third, a cross-sectional design captures consumer perceptions at one point in time and cannot fully explain how trust develops through repeated interaction with AI systems.

Fourth, purchase intention may not always result in actual purchasing behavior. Consumers may change their decisions because of price, availability, professional advice or other factors.

17. Results and Discussion

The empirical analysis of the study should be based on responses obtained from consumers in Uttarakhand who have experience with online healthcare products or AI-based recommendations. The analysis is intended to determine whether the factors identified in the conceptual model influence consumer trust and purchase intention.

Perceived usefulness is expected to be an important factor because consumers generally value technologies that reduce search time and simplify product selection. When an AI system provides relevant alternatives without requiring consumers to examine numerous products, it can make the purchasing process more convenient.

Personalization is another important factor. Consumers may appreciate recommendations that reflect their previous searches and preferences. However, personalization may also create privacy concerns when consumers are uncertain about how their information is being collected and used.

Information quality is expected to have a positive relationship with trust. Clear product descriptions, accurate specifications and relevant information can reduce uncertainty and improve confidence in AI-generated recommendations.

Perceived risk is expected to have a negative relationship with trust. Consumers who believe that an AI recommendation may result in an unsuitable healthcare product may be less willing to rely on it. Privacy concerns may similarly reduce confidence when consumers feel that their personal information is not adequately protected.

The central relationship in the study is expected to be between **consumer trust and purchase intention**. Consumers who consider an AI system reliable and dependable may be more willing to consider purchasing its recommended products. Thus, trust may act as an important psychological link between AI recommendation characteristics and consumer purchasing intention.

The statistical analysis should determine whether these expected relationships are supported by the actual survey responses. Numerical results such as means, correlation coefficients, regression coefficients and significance values should be reported only after genuine primary data have been collected.

18. Theoretical Implications

The study contributes to research on technology adoption and consumer behavior by combining technological, psychological and risk-related factors in the context of AI-powered healthcare product recommendations.

Perceived usefulness reflects the technological value of AI, while personalization and information quality represent important characteristics of recommendation systems. Perceived risk and privacy concern introduce the uncertainty associated with AI-based consumer decisions.

The study particularly emphasizes the role of trust. Consumers may recognize the usefulness of AI but may not necessarily rely on its recommendations. Trust can potentially convert a positive evaluation of technology into greater purchase intention.

The research therefore provides a broader perspective on AI adoption by considering not only convenience but also confidence, privacy and perceived risk.

19. Managerial Implications

The study can provide useful implications for online healthcare retailers and AI-based shopping platforms.

First, recommendation systems should focus on **relevance and accuracy** rather than simply displaying a large number of recommendations. Consumers are more likely to trust recommendations that appear genuinely connected to their requirements.

Second, platforms should provide **clear and reliable product information** alongside AI recommendations. Consumers should be able to evaluate products independently rather than depending entirely on the algorithm.

Third, companies should communicate their **data-collection and privacy practices** clearly. Transparency can reduce uncertainty and may strengthen consumer confidence.

Fourth, AI recommendations for healthcare products should not be presented as professional medical advice. Platforms should maintain a clear distinction between product recommendations and clinical guidance.

Finally, companies should treat consumer trust as a long-term objective. Consistent recommendations, transparent practices and accurate information can contribute to stronger consumer relationships.

20. Implications for Consumers and Policymakers

The study highlights the need for consumers to evaluate AI-generated healthcare recommendations carefully. A personalized recommendation does not necessarily mean that a product is medically suitable for every individual.

Consumers should examine product information, compare alternatives and seek qualified professional advice whenever appropriate.

For policymakers, the increasing use of AI in healthcare-related commerce highlights the importance of consumer protection, privacy and transparency. Platforms should provide sufficient information about AI involvement and responsible data usage.

21. Conclusion

AI-powered healthcare product recommendations are becoming an important component of digital consumer behavior. Such systems can reduce search effort and provide personalized product suggestions,

but technological convenience alone may not guarantee consumer adoption.

The present study proposes that **trust is a central factor influencing purchase intention**. Perceived usefulness, personalization and information quality are expected to strengthen trust, whereas perceived risk and privacy concerns may weaken it.

The focus on Uttarakhand provides a regional perspective that can contribute to the understanding of AI-supported consumer behavior beyond major metropolitan markets. Differences in digital exposure, online shopping experience and consumer characteristics may influence the acceptance of AI recommendations.

The study also demonstrates the importance of responsible AI design. Consumers require recommendations that are useful and personalized, but they also require reliable information, transparency and confidence regarding the use of their personal data.

Overall, successful adoption of AI-powered healthcare product recommendations is likely to depend not only on the technical capability of the recommendation system but also on the **trust that consumers place in it**.

22. Limitations and Future Research

The study has several limitations. The use of purposive sampling may limit the generalization of findings to the entire population of Uttarakhand. The cross-sectional design also captures consumer perceptions at a particular point in time.

Another limitation is that purchase intention may not always result in actual purchasing behavior. Factors such as price, availability, reviews and professional advice may influence the final decision.

Future studies may use larger and more representative samples and compare consumers from urban, semi-urban and rural areas. Researchers may also compare different categories of healthcare products because perceived risk may vary across product types.

Longitudinal studies could examine whether repeated positive experiences with AI recommendations increase consumer trust over time. Future research could also examine AI transparency, explainability,

digital literacy, platform reputation and previous experience with AI.

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