

June 29, 2024

IIHMR Univeristy, Jaipur

A Review on the Perception of Medical Device Adoption Among Individuals in India

STUDENT

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IIHMR-U/01/2022-24/1442

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Internship Organisation – Orbees Business Solutions Pvt. Ltd.



Orbees Medical enables medical technology companies to grow their business by offering consulting solutions that are backed by comprehensive research, robust analyses and actionable recommendations.

Value Propositions

1. Superior Strategic Market and Clinical Insights – We provide meaningful strategic and market insights that are rooted in a deep understanding of care continuum of various disease spaces, therapies, and technologies.
2. Global Coverage – US, EU-5, BRIC, other developed and emerging markets
3. Flexible and Agile – Always able to respond to client's time sensitive requirements and challenges with speed and resource bandwidth.
4. Diversified Team – MBA's, engineers, medical doctors, life-science majors, and statisticians; native language experts to communicate in local language across the major markets.
5. Cost Effective – Unfailingly provide above and beyond expected value, each time, well within the client's budget.

Mission: The mission is to provide superior value to the client that enables them to grow, and stay ahead of the competition. To achieve this we challenge ourselves to take on their toughest problems, go beyond their expectations, and provide impactful solutions. It is the reason why our clients come back to us repeatedly.



Responsibilities

- Conducting secondary research on clinical space and deducing a patient care pathways.
- Performing market analysis and developing a market model for the medical device.
- Assessing the competitive landscape and identifying key competitors.
- Identifying market drivers and barriers, and developing insights to overcome these barriers.
- Proposing strategies to increase market share and enhancing market penetration.

Challenges

- Limited access to up-to-date and comprehensive data sources.
- Navigating complex and varying regulatory requirements.
- Integrating diverse data sets to create a cohesive and accurate market model.

Learnings

- Developed advanced skills in sourcing and verifying up-to-date and comprehensive data.
- Gained a deep understanding of the complex regulatory landscape for medical devices.
- Enhanced ability to integrate diverse data sets and create accurate market models.



- **Medical devices**, from simple tools to advanced systems, are essential for improving **diagnostic accuracy and treatment efficiency** in healthcare.
- Wearable devices and remote monitoring systems enable **continuous health management**, especially aiding chronic disease care and reducing hospital readmissions.
- India's healthcare system has significant disparities, with **urban areas** having **better access to advanced care** compared to rural regions.
- **Government initiatives** like Ayushman Bharat **aim to improve healthcare accessibility**, but **challenges** such as **inadequate rural infrastructure and high out-of-pocket costs** persist.
- Understanding **Indian individuals' perceptions** of medical devices is crucial for identifying adoption barriers, such as cost and cultural issues, and finding ways to encourage adoption.
- Insights from this review will help policymakers and manufacturers improve regulations, affordability, product development, and **address healthcare access gaps to ensure equitable benefits** from medical advancements.

Author (Year)	Sample Size	Sampling Technique	Salient Features
Gupta et al. (2023) "Factors Influencing Adoption of Remote Monitoring Devices"	600	Cluster Sampling	Explored factors influencing the adoption of remote monitoring devices among cardiac patients; identified perceived usefulness and ease of use as key determinants.
Thaker et al. (2022) "Adoption of Wearable Medical Devices"	500	Random Sampling	Investigated the awareness and acceptance of wearable medical devices; found that higher awareness correlated with greater acceptance and usage.
Mishra & Singh (2022) "Perception of Smart Inhaler Adoption Among Asthmatic Patients"	350	Convenience Sampling	Investigated the perception of smart inhaler adoption among asthmatic patients; found concerns about affordability and data privacy.
Patel et al. (2021) "Role of Physician Recommendation in Medical Device Adoption"	450	Systematic Sampling	Asked about the influence that medical advice has on the introduction of new remedies.
Sharma & Gupta (2021) "Barriers to Telemedicine Devices During COVID-19"	350	Convenience Sampling	The article examines the difficulties involved in bringing modern telemedicine into play with COVID-19 cases.

Author (Year)	Sample Size	Sampling Technique	Salient Features
Singh et al. (2020) "Home-Based Diagnostic Devices Adoption"	400	Stratified Sampling	Focuses upon the introduction of self-care diagnostics into private households; emphasizes that professional advice given by health workers plays an important part in bringing about this development.
Reddy & Kumar (2020) "Barriers to Wearable Health Device Adoption Among Elderly Population"	300	Random Sampling	Explored barriers to acceptance for wearable devices by seniors – identified difficulties with use due to too much technical detail.
Patel & Desai (2019) "Impact of Socio-Economic Factors on Insulin Pump Use"	300	Purposive Sampling	Investigated how socioeconomic status affects the use of insulin pumps in diabetics – Income and educational level are both statistically relevant.
Singh & Sharma (2019) "Awareness and Acceptance of Telehealth Devices in Rural Communities"	250	Stratified Sampling	The researchers investigated the use of modern telecommunications technology as an instrument for health promotion among people living in remote areas.
Rao et al. (2018) "Perceptions of Mobile Health Apps for Chronic Disease Management"	450	Systemic Sampling	Examine the willingness of patients with chronic illnesses to use apps for mobile phone-supported disease management.

Author (Year)	Sample Size	Sampling Technique	Salient Features
Verma et al. (2018) "Impact of Cultural Beliefs on Medical Device Adoption in Urban Slums"	400	Purposive Sampling	The research explored how traditional beliefs affect the acceptance of new technologies among people living in urban poverty areas.
Kumar & Jain (2017) "Adoption of Digital Health Records"	200	Snowball Sampling	Analyzed the adoption of digital health records; revealed concerns about privacy and data security as major hindrances.
Yadav & Gupta (2017) "Perception of Smartphone Health Apps Among Young Adults"	200	Snowball Sampling	Analyzed the perception of smartphone health apps among young adults; identified concerns about data accuracy and reliability.
Kaur et al. (2016) "Attitudes Towards AEDs in Public Places"	200	Cluster Sampling	Explored attitudes towards automated external defibrillators (AEDs) in public places; found that lack of awareness and training were significant barriers.



Study Design: A systematic literature review was chosen to organize and analyze current literature on medical device adoption in India, ensuring neutrality and comprehensive coverage.

Inclusion Criteria: Studies must be conducted in India, published in peer-reviewed journals, focused on medical device adoption, and published between January 2016 and December 2023.

Exclusion Criteria: Excludes studies not specific to medical devices, non-peer-reviewed publications, research outside India, and articles published before 2016.

Information Sources: Includes databases like PubMed, Google Scholar, Scopus, Web of Science, clinical trial registers, relevant organization websites, reference lists, and official documents, with searches completed by June 2024.

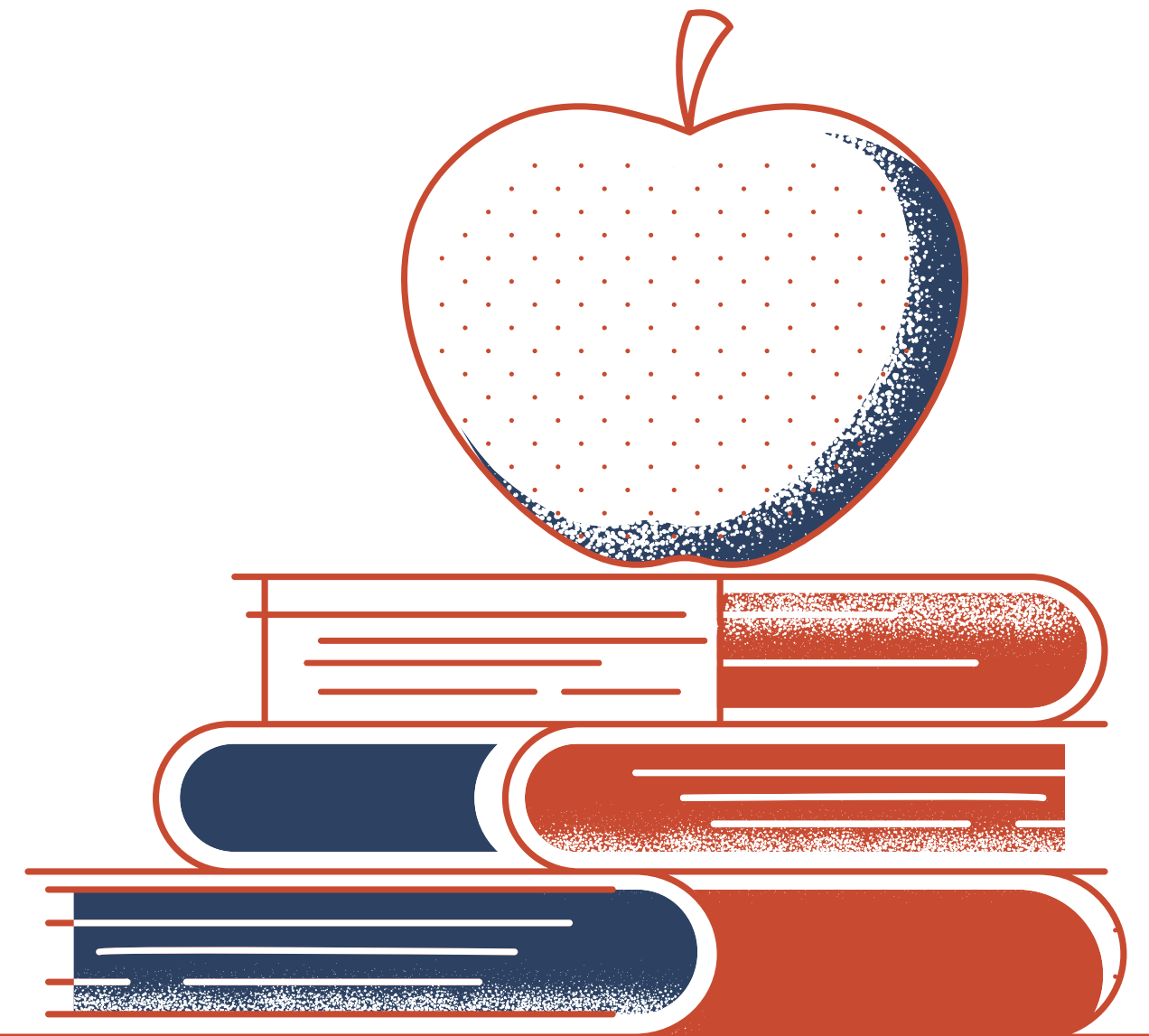
Search Strategy: Uses specific keywords, filters, Boolean operators, and search fields across databases to ensure relevant results from 2016–2023.

Selection Process: Involves initial screening of titles and abstracts, full-text reviews, and consultation with mentors for resolution, without using automation tools.



Key Questions

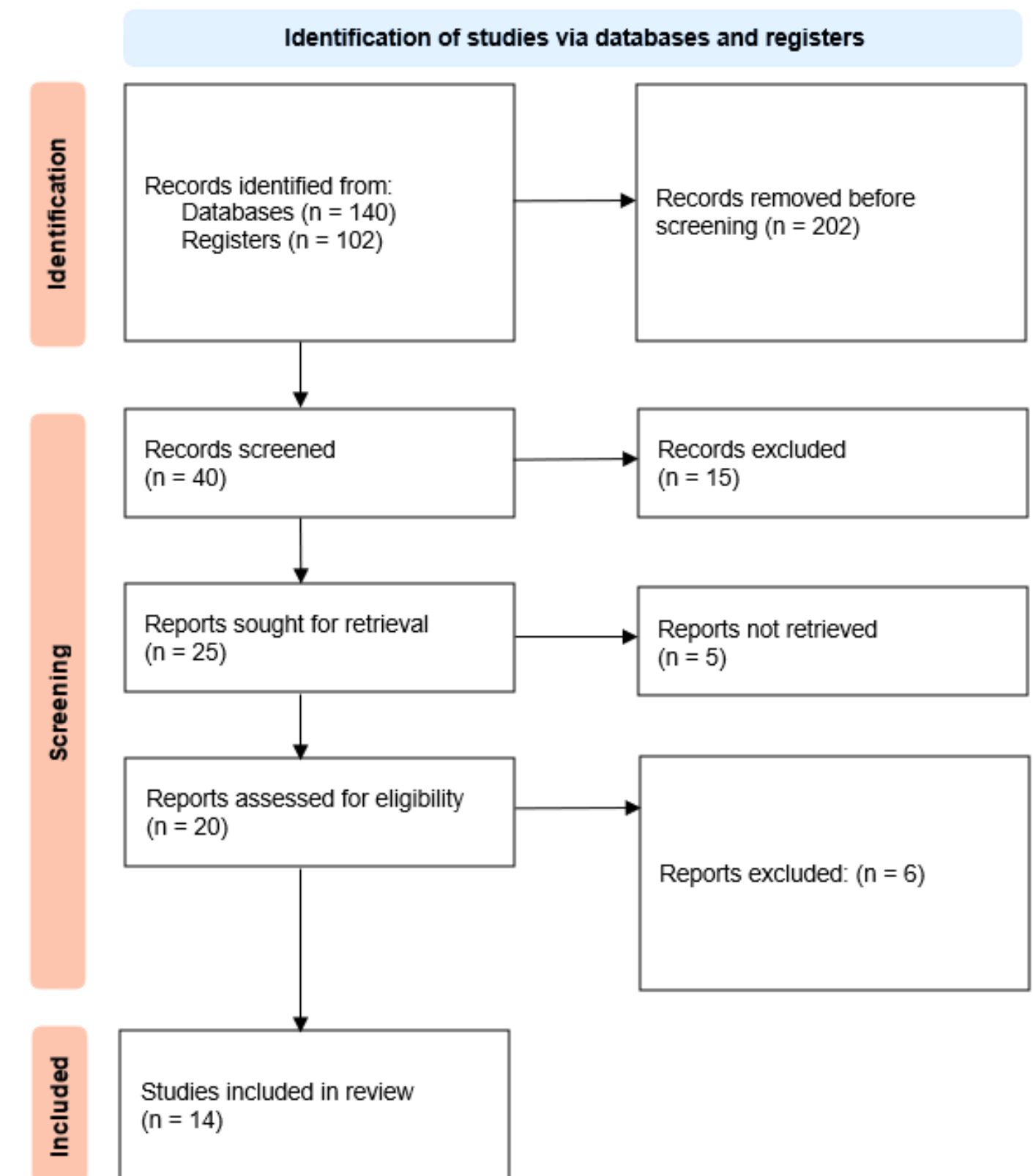
1. Which universal characteristics or attributes are predominant in determine the perception and acceptance of medical devices by the target audience in India?
2. Concerning the influence of socio-economic variables, peculiarities of culture as well as technology, how do these factors play out concerning the medical devices adoption?
3. Identify and analyze key factors that act as impediments or enablers to the adoption of medical devices in India.
4. How the demographic characteristics including age, gender, education and income level of the population influence the perception and use of medical devices?
5. How does health literacy impact the uptake of medical devices?



Identification: Initially, 242 articles were identified from databases like PubMed, Google Scholar, Scopus, and Web of Science, alongside clinical trial and healthcare research registers.

Screening: Out of these, 202 articles were excluded after initial screening due to duplication or lack of relevance to the study's focus on medical device adoption in India. This left 40 articles for detailed evaluation.

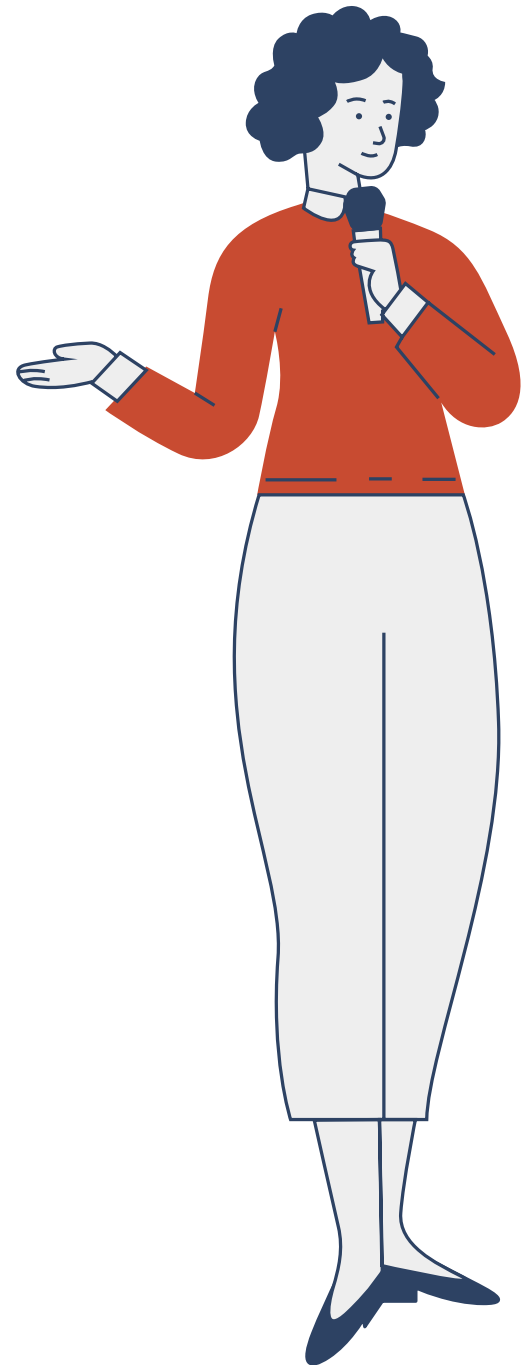
Included: After thorough assessment, 14 articles met all inclusion criteria, focusing on medical device adoption among the Indian population. These studies were selected based on their relevance, quality, and alignment with the study objectives.



Author (Year) & Location	Sample Size	Sampling Technique	Key Findings
Gupta et al. (2023) "Factors Influencing Adoption of Remote Monitoring Devices" – Delhi	600	Cluster Sampling	Perceived usefulness and ease of use are key determinants.
Thaker et al. (2022) "Adoption of Wearable Medical Devices" – Mumbai	500	Random Sampling	Higher awareness correlated with greater acceptance and usage.
Mishra & Singh (2022) "Perception of Smart Inhaler Adoption Among Asthmatic Patients" – Lucknow	350	Convenience Sampling	Concerns about affordability and data privacy.
Patel et al. (2021) "Role of Physician Recommendation in Medical Device Adoption" – Mumbai	450	Systematic Sampling	Importance of trust and credibility in physician recommendation.
Sharma & Gupta (2021) "Barriers to Telemedicine Devices During COVID-19" – Delhi	350	Convenience Sampling	Cost and lack of technological literacy as major barriers.

Author (Year) & Location	Sample Size	Sampling Technique	Key Findings
Singh et al. (2020) "Home-Based Diagnostic Devices Adoption" – Bangalore	400	Stratified Sampling	Healthcare professionals' recommendations influence adoption.
Reddy & Kumar (2020) "Barriers to Wearable Health Device Adoption Among Elderly Population" – Hyderabad	300	Random Sampling	Concerns about device complexity and usability among elderly.
Patel & Desai (2019) "Impact of Socio-Economic Factors on Insulin Pump Use" – Ahmedabad	300	Purposive Sampling	Income and education levels significant predictors of insulin pump use.
Singh & Sharma (2019) "Awareness and Acceptance of Telehealth Devices in Rural Communities" – Jaipur	250	Stratified Sampling	Need for infrastructure and digital literacy in rural communities.
Rao et al. (2018) "Perceptions of Mobile Health Apps for Chronic Disease Management" – Hyderabad	450	Systemic Sampling	Ease of use and perceived benefits key determinants of adoption.

Author (Year) & Location	Sample Size	Sampling Technique	Key Findings
Verma et al. (2018) "Impact of Cultural Beliefs on Medical Device Adoption in Urban Slums" – Kolkata	400	Purposive Sampling	Cultural beliefs and community influencers impact adoption.
Kumar & Jain (2017) "Adoption of Digital Health Records" – Chennai	200	Snowball Sampling	Privacy and data security concerns as major hindrances.
Yadav & Gupta (2017) "Perception of Smartphone Health Apps Among Young Adults" – Pune	200	Snowball Sampling	Concerns about data accuracy and reliability among young adults.
Kaur et al. (2016) "Attitudes Towards AEDs in Public Places" – Chennai	200	Cluster Sampling	Lack of awareness and training significant barriers to AED adoption.



Primary Factors Influencing Perception and Adoption

- **Perceived usefulness and ease of use** are critical in adoption decisions for medical devices like remote monitoring tools in New Delhi (Wang et al., 2023).
- **Awareness and education campaigns** significantly boost adoption rates of wearable medical devices in Mumbai (Thaker et al., 2022).
- Economic factors such as **affordability and privacy concerns** influence the adoption of smart inhalers in Lucknow (Mishra & Singh, 2022).
- **Low technological understanding** and accessibility hindered the adoption of telemedicine devices during the COVID-19 pandemic in Delhi (Sharma & Gupta, 2021).



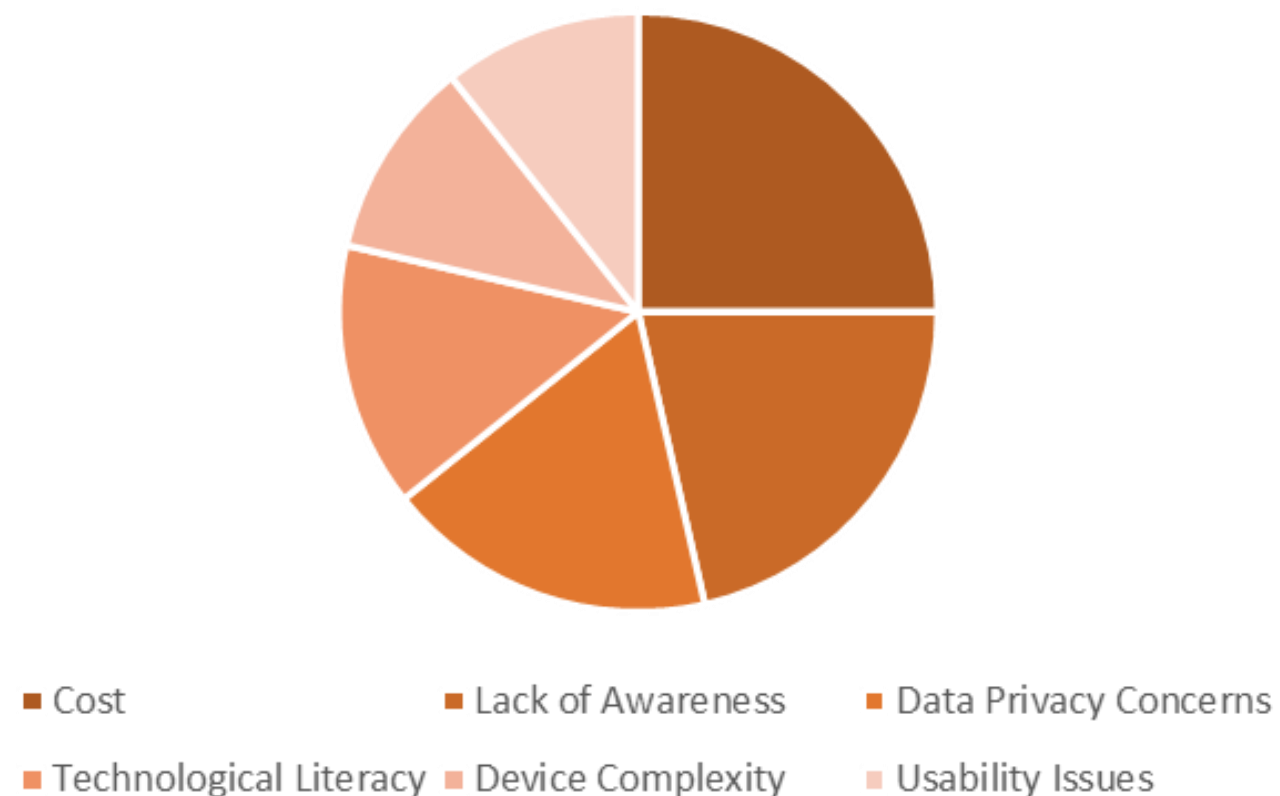


Impact of Socio-Economic, Cultural, and Technological Factors

- **Income and education level** determine **insulin pump** usage in Ahmedabad (Patel & Desai, 2019).
- Socioeconomic factors impact **awareness of telehealth devices** in rural Jaipur (Singh & Sharma, 2019).
- **Cultural beliefs** influence medical device adoption in Kolkata's urban slums (Verma et al., 2018).
- Technological factors like **convenience and perceived benefits** affect mobile health app adoption in Hyderabad (Rao et al., 2018).

Challenges Hindering Medical Device Adoption in India

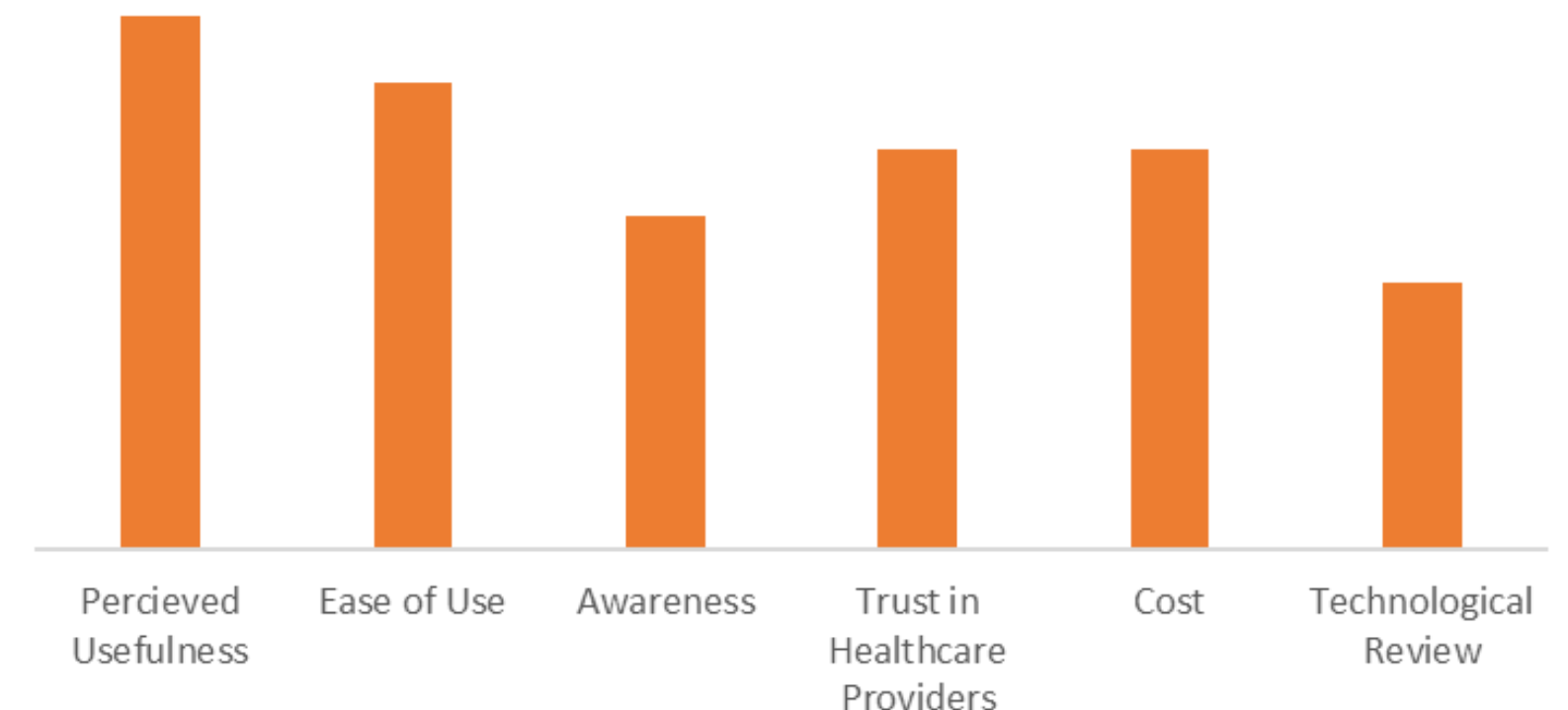
Barriers to Medical Device Adoption



- **Cost is a significant barrier** to healthcare access (Sharma & Gupta, 2021), while **low awareness** hampers smart inhaler use in Lucknow (Mishra & Singh, 2022).
- **Technological literacy** gaps also impede device adoption (Gupta et al., 2023), necessitating better user education and interface designs.

Factors Promoting Medical Device Adoption

Factors Influencing Medical Device Adoption



- **Physician endorsement** enhances perceived **utility and ease of use** (Fowler & Warnest, 2022).
- **Increased awareness** positively impacts medical device acceptance (Thaker et al., 2022).
- **Trust in healthcare providers** influences patient willingness to adopt medical devices (Patel et al., 2021).

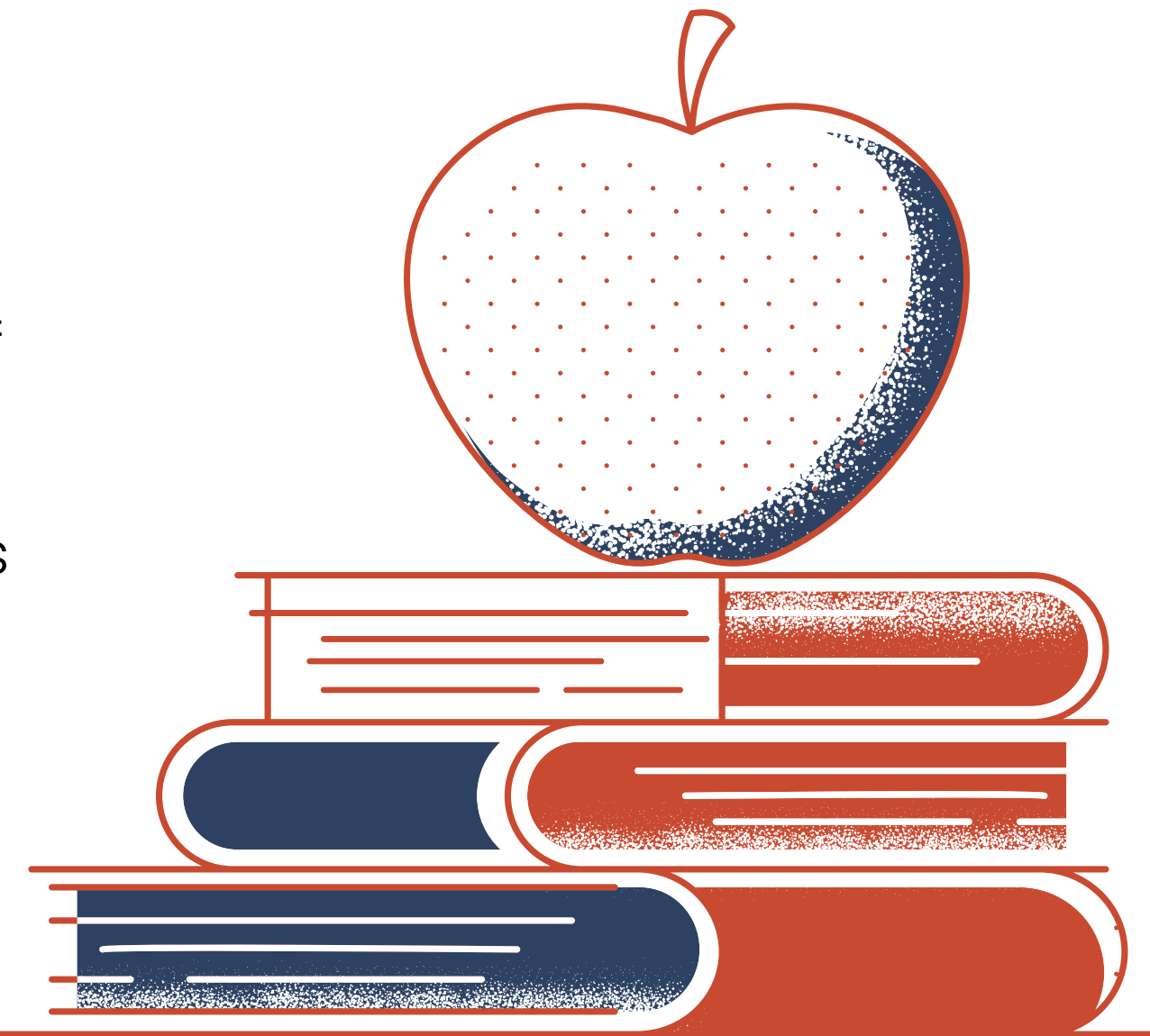
Demographic Variations



- Demographic factors like **age, gender, education, and income** shape medical device adoption in India (Reddy & Kumar, 2020; Yadav & Gupta, 2017).
- **Elderly** in Hyderabad find **wearable health devices complex**, needing simpler options for accessibility (Reddy & Kumar, 2020).
- Pune's **youth prioritize data credibility** in healthcare technology decisions (Yadav & Gupta, 2017).
- **Higher education and income levels** in Ahmedabad correlate with insulin pump usage (Patel & Desai, 2019).
- Rural Jaipur shows **improved telehealth device awareness**, highlighting **infrastructure needs** (Singh & Sharma, 2019).

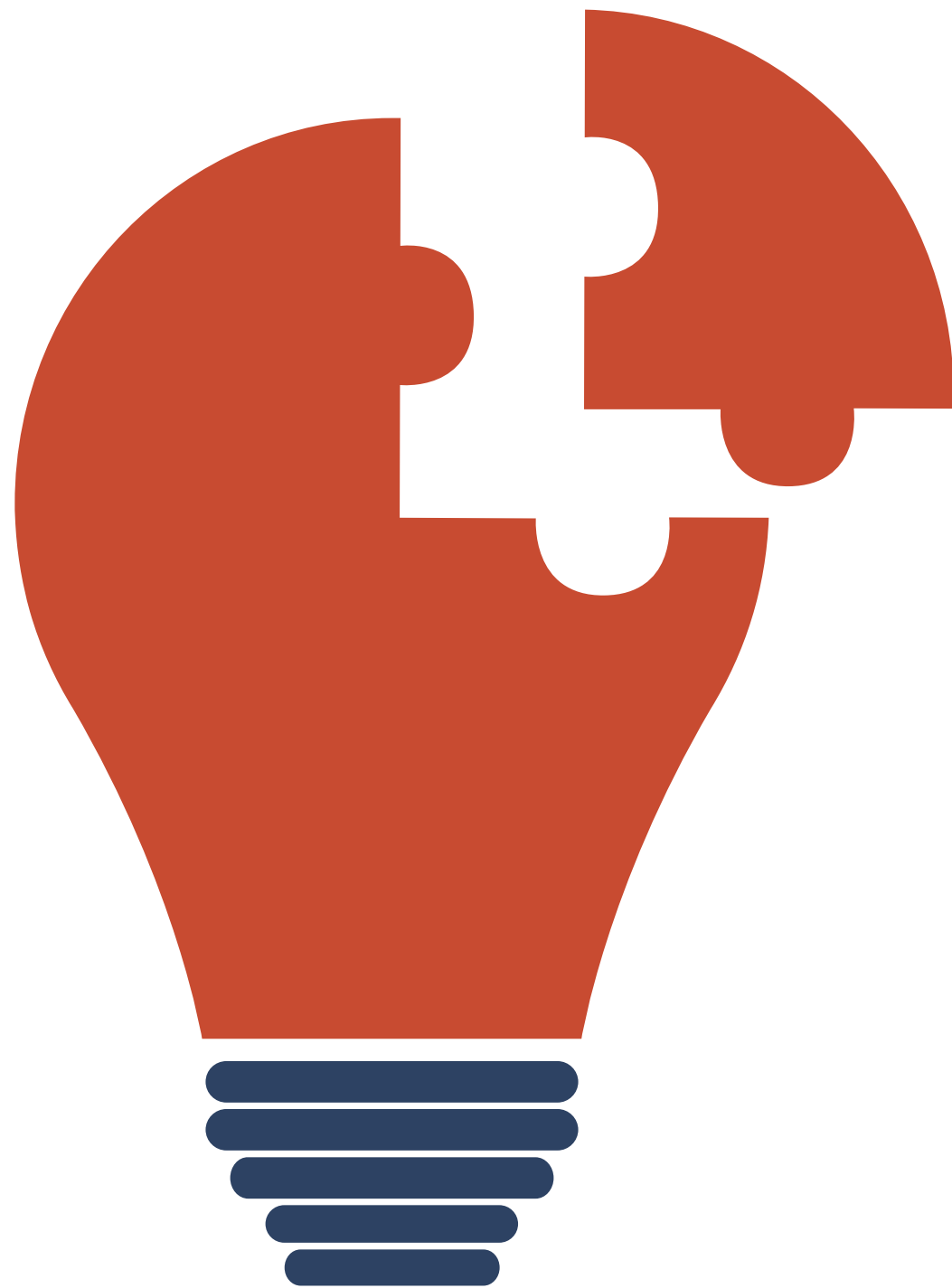
Role of Health Literacy

- Health literacy shapes how medical devices are perceived and used in India, influencing adoption rates significantly.
- **Lack of technological skills**, as seen in studies like Sharma & Gupta (2021), **impedes the uptake of telemedicine and digital health solutions**, particularly among less educated populations.
- Singh et al. (2020) underscore the role of **healthcare professionals' recommendations and user education** in promoting acceptance of **home-based diagnostic devices** in cities like Bangalore.
- Enhancing health literacy through targeted interventions empowers individuals to make informed decisions about adopting medical technologies, bridging access gaps across demographics.
- Strengthening health literacy is critical for fostering widespread understanding and effective utilization of medical devices in India's healthcare system.





- Medical device **adoption** in India is influenced by **perceived usefulness and ease of use** (Gupta et al., 2023).
- **Socio-economic status, cultural beliefs, and technological infrastructure** impact adoption rates (Singh & Sharma, 2019; Verma et al., 2018).
- **Cost and data security concerns hinder adoption**, while physician endorsement and awareness campaigns promote acceptance (Sharma & Gupta, 2021; Mishra & Singh, 2022).
- **Younger, more educated individuals** with higher incomes tend to **adopt** the technologies **more readily** (Ahmed et al., 2019; Reddy & Kumar, 2020).
- **Limited health literacy presents a significant barrier**, necessitating educational initiatives (Singh et al., 2020; Sharma & Gupta, 2021).



- Enhance **educational initiatives** to improve **health literacy and technological proficiency** across diverse demographic groups.
- Implement **subsidies or financial assistance programs** to mitigate cost barriers associated with medical device adoption.
- **Tailor medical device designs and functionalities** to be more **user-friendly and culturally appropriate** for diverse populations in India.
- Foster **trust and credibility among healthcare providers** to **enhance patient confidence** in adopting medical technologies.
- Develop **targeted awareness campaigns** to educate the **public** about the benefits and functionalities of medical devices, **particularly in rural and underserved areas.**

The End

Thank you

