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Challenges in adopting health technology assessment for evidence-based policy in Iran: a qualitative study

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Abstract

Background Health Technology Assessment (HTA) is a vital tool for evidence-based healthcare decision-making, yet its adoption in Iran remains limited despite its potential to improve policy and resource allocation. This qualitative study explores the challenges hindering the integration of HTA into Iran's healthcare system, providing insights from key stakeholders.

Methods A qualitative research design was employed, using in-depth, semi-structured interviews with 23 stakeholders, including health policymakers, HTA experts, and healthcare professionals. Participants were selected through purposive sampling to ensure diverse representation across Iran's healthcare sectors. Data were analyzed using thematic content analysis based on Braun and Clarke's framework, with MAXQDA software for coding and analysis. Validation was achieved through member-checking and peer debriefing.

Results The challenges were categorized into internal and external factors. Internal factors included institutional challenges such as a lack of clear policies or guidelines, inadequate institutional support, and bureaucratic constraints; resource limitations, including insufficient financial resources, human resource shortages, and gaps in technological infrastructure; knowledge and awareness gaps, characterized by limited awareness among decision-makers, insufficient training and education, and a preference for traditional methods; and data and evidence gaps, including a lack of reliable data, a limited local evidence base, and challenges in data sharing. External factors included political and economic influences, such as political instability, policy shifts, economic pressures, and the influence of interest groups; as well as ethical and equity concerns, which involved challenges in ethical decision-making, equity concerns, and public perception and acceptance.

Conclusion This study highlights the multifaceted challenges to HTA adoption in Iran, emphasizing the need for stronger institutional frameworks, increased resources, enhanced stakeholder awareness, and improved public engagement. Addressing these challenges through targeted policy interventions can facilitate the integration of HTA into healthcare decision-making, promoting more equitable and evidence-based policies in Iran. These findings can guide policymakers and healthcare leaders in designing context-specific solutions to enhance HTA utilization. The

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findings also offer valuable lessons for other low- and middle-income countries facing similar challenges, contributing to the global discourse on HTA implementation in resource-constrained settings.

Keywords Health technology assessment, Healthcare challenges, Evidence-based policymaking, Qualitative research, Policy implementation, Resource allocation, Health policy

Introduction

Health Technology Assessment (HTA) is a systematic process that evaluates the medical, social, economic, and ethical dimensions of health technologies, providing a robust foundation for evidence-based decision-making [1]. Globally, HTA has emerged as a critical tool for optimizing resource allocation, improving healthcare outcomes, and ensuring the sustainability of health systems [2]. By assessing the cost-effectiveness, safety, and clinical efficacy of health technologies, HTA enables policymakers to make informed decisions about the adoption, reimbursement, and prioritization of interventions [3]. However, despite its proven benefits, the integration of HTA into healthcare systems remains uneven, particularly in low- and middle-income countries (LMICs), where institutional, resource, and political challenges often hinder its adoption [4].

In Iran, the healthcare system faces significant pressures due to rising costs, advancing medical technologies, and constrained financial resources, creating an urgent need for efficient and equitable resource allocation [5]. While Iran has recognized the potential of HTA to address these challenges, its adoption has been inconsistent, limiting its impact on policy and practice [6]. Despite gradual efforts to incorporate HTA methodologies into national health policies, significant challenges persist, including institutional weaknesses, resource limitations, and a lack of stakeholder awareness [7].These challenges are further compounded by Iran's unique socio-political and economic context, which includes political instability, economic sanctions, and a complex healthcare financing system [8].

At the global level, HTA has been widely implemented in high-income countries, with institutions such as the National Institute for Health and Care Excellence (NICE) in the UK and the Institute for Quality and Efficiency in Health Care (IQWiG) in Germany playing central roles in health policy decisions [9]. In contrast, many LMICs, including Iran, face challenges such as fragmented HTA governance, a lack of standardized processes, and inadequate funding for HTA activities [10]. Studies have shown that even in LMICs where HTA has been introduced, its integration into policy remains weak due to limited institutional support and insufficient capacity-building initiatives [11, 12].

Globally, the implementation of HTA has faced similar obstacles, particularly in LMICs. Common challenges include inadequate institutional frameworks and limited technical expertise [13]. Political and economic constraints, along with insufficient stakeholder engagement, have also been significant challenges [14]. For example, studies have highlighted the absence of standardized guidelines and bureaucratic inefficiencies as major impediments to HTA adoption [9, 15]. In some regions, resource limitations and data infrastructure gaps have been identified as critical challenges [16]. However, the specific manifestations of these challenges often depend on the local context, underscoring the need for country-specific analyses to inform tailored solutions [17].

In Iran, the integration of HTA into the healthcare system has been hindered by a combination of institutional, resource-related, and political factors. The lack of a centralized national framework for HTA has resulted in inconsistent application across different healthcare sectors, while bureaucratic inefficiencies and limited institutional support have further slowed its adoption [18].

Additionally, economic pressures and political instability have created an environment where long-term initiatives like HTA are often deprioritized in favor of short-term solutions [19]. Despite these challenges, there is growing recognition of the potential benefits of HTA, including improved transparency, cost-effectiveness, and equity in healthcare decision-making [5, 20]. However, a systematic exploration of the challenges to HTA adoption, particularly through qualitative research that captures stakeholder perspectives, remains limited [5].

Previous studies on HTA in Iran have primarily focused on its theoretical importance, the development of methodological frameworks, or specific case studies evaluating particular health interventions [5, 21]. However, there remains a significant research gap in understanding the practical challenges to HTA adoption from the perspectives of key stakeholders. While some research has explored HTA implementation challenges in Iran, these studies often lack an in-depth qualitative approach that captures the lived experiences of policymakers, healthcare professionals, and HTA experts [22]. This study builds upon and extends prior research by systematically examining the institutional, economic, and political challenges affecting HTA adoption in Iran, filling an essential gap in the literature. This qualitative study aims to address this gap by exploring the challenges hindering the adoption of HTA in Iran's healthcare system. Through in-depth interviews with policymakers, healthcare professionals, and HTA experts, the study seeks to identify the key challenges and provide actionable

recommendations for overcoming them. By focusing on stakeholder experiences and perspectives, this research not only contributes to the Iranian context but also offers valuable insights for other LMICs facing similar challenges, enriching the global understanding of HTA implementation in resource-constrained settings.

Methods

This study employed a qualitative research design to explore the challenges hindering the adoption of HTA in Iran's healthcare system. A hybrid deductive-inductive approach was used for thematic analysis, allowing for the identification of both pre-defined and emerging themes. This approach enabled a comprehensive understanding of the challenges to HTA utilization while ensuring alignment with existing literature and the unique context of Iran. The study adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) to ensure transparency and rigor in reporting [23] (Supplementary File 1). Ethical approval for this study was obtained from Lorestan University of Medical Sciences Ethics Committee, under approval number (IR.LUMS.REC.1402.310). All participants provided written informed consent before participation, ensuring their voluntary involvement and confidentiality. Participants were informed of their right to withdraw at any stage without consequences. The study complied with the ethical principles outlined in the Declaration of Helsinki.

Participant selection

Participants were selected through purposive sampling to ensure representation from key stakeholder groups involved in HTA and healthcare decision-making in Iran. The inclusion criteria required participants to have direct experience with HTA processes or decision-making within the past five years. Stakeholders included health policymakers, HTA experts, healthcare professionals, and senior health managers. A total of 30 individuals were invited to participate, and 23 agreed to take part in the study. The sample size was determined based on data saturation, which was achieved when no new themes emerged from the interviews.

Saturation was assessed through an iterative process during data collection and analysis. Researchers reviewed transcripts continuously, and after the 21st interview, no new themes emerged. Two additional interviews were conducted to confirm saturation, after which data collection was concluded.

Data collection

A semi-structured interview guide was developed specifically for this study by the research team and was not used in any previous or concurrent research. The guide, which is included in Supplementary File 2, was designed to align with the study's objectives and to explore the challenges to HTA adoption in Iran's healthcare system. The guide was pre-tested with four participants to ensure clarity, relevance, and appropriateness for the study context.

The interviews were conducted in Persian, the native language of all participants, to ensure clarity and depth of responses. Interviews were carried out in-person ($n = 15$) or virtually via secure online platforms ($n = 8$) based on participant preference and availability. The interviews were conducted at participants' workplaces ($n = 17$) or private settings ($n = 6$) to ensure confidentiality and minimize interruptions.

Two trained researchers (SS and MaB) conducted the interviews, which lasted between 60 and 85 min and were audio-recorded with participants' consent. Field notes were taken to capture non-verbal cues and contextual observations. Iterative refinements to the interview guide were made during data collection to ensure responsiveness to emerging themes.

Data analysis

Thematic analysis was conducted following Braun and Clarke's six-phase framework [24]. First, interview transcripts were transcribed verbatim and reviewed multiple times to ensure familiarity with the data. Initial codes were generated inductively and deductively, reflecting both emerging themes and pre-defined categories. These codes were then organized into broader themes and sub-themes, which were reviewed and refined to ensure consistency with the data. The final themes were clearly defined and supported by representative quotes from participants.

The analysis followed these six phases of Braun and Clarke's framework: a) Data Familiarization—researchers immersed themselves in the data by reading and re-reading transcripts; b) Initial Coding—researchers generated initial codes based on patterns identified; c) Theme Identification—codes were grouped into themes and subthemes; d) Theme Review—identified themes were refined to ensure coherence; e) Theme Definition—final themes were defined with supporting evidence; and f) Reporting—key themes were summarized with direct participant quotations.

To enhance the reliability of the analysis, two researchers (AB and SA) independently coded the data using MAXQDA software (Version 10), and discrepancies were resolved through discussion with the research team.

Inter-coder agreement was assessed using Cohen's kappa coefficient, achieving a substantial agreement level ($\kappa = 0.78$). Member-checking was conducted by sharing preliminary findings with a subset of participants ($n = 6$) to validate the accuracy and interpretation of the results. Additionally, participants were offered the opportunity to

review and verify their transcribed interviews to ensure authenticity.

Ensuring rigor

The study employed several strategies to ensure the trustworthiness of the findings, guided by the criteria of credibility, dependability, confirmability, and transferability.

- **Credibility** was achieved through prolonged engagement with the data, triangulation of findings with existing literature, and member-checking.
- **Dependability** was ensured by maintaining a detailed audit trail of the research process, including coding decisions and thematic development.
- **Confirmability** was addressed through reflexivity, with researchers documenting their potential biases and preconceptions throughout the study.
- **Transferability** was enhanced by providing a thick description of the study context, participants, and processes, enabling readers to assess the applicability of the findings to other settings.

Triangulation in this study was conducted by comparing interview findings with policy documents and previous literature. Although observational data were not collected, the inclusion of multiple data sources strengthened the validity of findings.

Study design considerations

Given the focus on expert perspectives and structured thematic development, this study aligns with qualitative content analysis rather than a phenomenological approach. Specifically, a directed content analysis approach was applied, where pre-existing frameworks informed initial coding, supplemented by emerging themes from the data. This approach was chosen to ensure alignment with prior research while allowing for contextual specificity.

Results

The study included 23 participants from diverse sectors and professional backgrounds within the Iranian healthcare system. Participants were aged 36 to 55 years, with a mean age of 45 years and an average of 15 years of professional experience. The sample comprised 6 females (26.08%) and 17 males (73.92%), representing health policymakers, HTA experts, healthcare professionals, and senior health managers. Table 1 presents the characteristics of the study participants.

Through thematic analysis, two overarching categories—internal and external factors—were identified as key challenges in adopting HTA in Iran's healthcare system. Internal factors included institutional challenges, resource limitations, knowledge and awareness gaps, and data and evidence gaps, while external factors encompassed political and economic influences, as well

Table 1 Characteristics of participants in this study

Id	Gender	Age	Duration of Activity	Educational Qualification	Sector	Position
1	Male	45	15 years	PhD	Public	Senior Health Policy Analyst
2	Male	50	20 years	PhD	Private	Director of Health Services
3	Female	40	12 years	PhD	Public	Clinical Nurse Manager
4	Male	55	25 years	PhD	Public	Health Systems Coordinator
5	Male	38	10 years	PhD	Private	Policy Researcher
6	Male	47	18 years	PhD	Public	Public Health Educator
7	Male	42	14 years	PhD	Private	Health Services Consultant
8	Male	48	17 years	PhD	Public	Hospital Administrator
9	Female	37	11 years	PhD	Private	Program Manager
10	Male	52	22 years	MD	Public	Senior Research Fellow
11	Female	41	16 years	PhD	Private	Health Policy Advisor
12	Male	46	13 years	PhD	Public	Public Health Manager
13	Male	39	10 years	PhD	Private	Health Economics Specialist
14	Male	54	20 years	PhD	Public	Health Systems Manager
15	Female	43	15 years	MD	Private	Director of Health Programs
16	Male	49	19 years	PhD	Public	Chief Medical Officer
17	Male	36	11 years	PhD	Private	Health Social Worker
18	Male	53	23 years	PhD	Public	Health Informatics Specialist
19	Male	44	12 years	PhD	Private	Health Services Researcher
20	Male	51	20 years	MD	Public	Health Policy Planner
21	Female	39	14 years	PhD	Private	Health Management Consultant
22	Male	46	15 years	PhD	Public	Senior Health Administrator
23	Female	40	12 years	MD	Private	Health Policy Consultant

Table 2 Identified themes and sub-themes representing challenges to the utilization of HTA in Iran's health system

Category	Theme	Sub-Themes
Internal factors		
	Institutional	1.Lack of clear policies or guidelines 2.Inadequate institutional support 3.Bureaucratic constraints
	Resource limitations	1.Insufficient financial resources 2.Human resource shortages 3.Technological infrastructure gaps
	Knowledge and awareness gaps	1.Limited awareness among decision-makers 2.Insufficient training and education 3.Preference for traditional methods
	Data and evidence gaps	1.Lack of reliable data 2.Limited local evidence base 3.Challenges in data sharing
External factors		
	Political and economic influences	1.Political instability and policy shifts 2.Economic pressures 3.Influence of interest groups
	Ethical and equity concerns	1.Ethical issues in decision-making 2.Equity concerns 3.Public perception and acceptance

as ethical and equity challenges. Below, we present these themes along with supporting participant perspectives. The themes and sub-themes derived from their comments are outlined in Table 2.

Internal factors

Institutional challenges

Lack of clear policies or guidelines

Participants frequently highlighted the absence of clear, unified policies or guidelines for integrating HTA into decision-making processes. This lack of standardization creates ambiguity and inconsistency in how HTA is applied across different healthcare sectors. For example, one participant explained how the absence of national guidelines leads to ad hoc decision-making:

> *"There's no clear policy that outlines when and how to use HTA, creating a lot of ambiguity for us. Some departments use HTA when making decisions, but others completely bypass it. Without national guidelines, everyone is working on their terms, which undermines the potential of HTA in the system." (Participant 1, Senior Health Policy Analyst).*

Another participant emphasized the need for formal policies to mandate the use of HTA findings:

> *"We don't have any national guidelines or frameworks, so even if an HTA is done, there's no obligation to use the results. It depends on the personal interest of leadership within each ministry, and that's not systematic. We need a formal policy that mandates the integration of HTA results into decision-making." (Participant 5, Policy Researcher).*

Inadequate institutional support

Many participants emphasized the lack of institutional support for HTA, despite its recognized potential. This lack of support manifests in insufficient funding, dedicated teams, and long-term commitment to HTA initiatives. One participant described how institutional priorities often overlook HTA:

> *"HTA is often recognized for its potential, but there isn't enough support from institutions to promote its use. Management tends to focus on short-term results, while HTA requires a long-term investment. Without dedicated teams, budgets, and institutional commitment, integrating HTA into decision-making becomes extremely difficult." (Participant 3, Clinical Nurse Manager).*

Another participant highlighted the cultural resistance to HTA within institutions:

> *"In my experience, management sees HTA as an additional task rather than an essential one. Even when HTA reports are prepared, they often sit on the shelf without being implemented. There needs to be a culture shift at the institutional level, where HTA is prioritized as a critical component of decision-making." (Participant 8, Hospital Administrator).*

Bureaucratic constraints

Bureaucratic inefficiencies were cited as a significant barrier to implementing HTA findings. Participants described how slow and cumbersome administrative processes delay the adoption of HTA results. One participant explained:

> *"The bureaucratic hurdles we face when trying to implement HTA findings are significant. Even after completing the analysis, getting approvals from various authorities can take months. Each administrative layer has its requirements, and by the time we get through the red tape, the data is often outdated or the opportunity for decision-making has passed." (Participant 9, Program Manager).*

Another participant echoed this sentiment, emphasizing how bureaucracy discourages the use of HTA:

> *"The approval process for HTA findings is so slow and cumbersome that it often feels like we're fighting against the system rather than working with it. This inefficiency discourages many of us from even attempting to use HTA in our work." (Participant 14, Health Systems Manager).*

Resource limitations

Insufficient financial resources

Participants identified the lack of funding as a major obstacle to conducting comprehensive HTAs. They explained how economic constraints often divert resources away from HTA initiatives. One participant noted:

> *"One of the major issues we face is the lack of funding to conduct thorough HTAs. The costs of gathering data, hiring skilled professionals, and conducting in-depth analyses are high, and HTA funding is typically the first thing to be cut during economic hardships." (Participant 5, Policy Researcher).*

Another participant highlighted how economic pressures prioritize short-term needs over long-term investments like HTA:

> *"In the current economic situation, securing funds for HTA is challenging. Health budgets are already stretched thin, and HTA, which is seen as a long-term investment, often falls to the bottom of the priority list." (Participant 10, Senior Research Fellow).*

Human resource shortages

The shortage of trained personnel was another critical barrier. Participants explained how the lack of skilled professionals limits the quality and impact of HTA. One participant stated:

> *"There is a shortage of trained personnel who are knowledgeable about HTA methodologies and can translate the findings into policy recommendations. Most of the people involved in HTA are doing it part-time or are not fully trained, which affects the quality of the assessments and limits their impact." (Participant 6, Public Health Educator).*

Another participant emphasized the need for experts who understand both the technical and policy aspects of HTA:

> *"We don't have enough experts who understand both the technical aspects of HTA and the policy implications. This gap makes it difficult to produce high-quality assessments that can actually influence decision-making." (Participant 13, Health Economics Specialist).*

Technological infrastructure gaps

Participants also highlighted the limitations of Iran's technological infrastructure. They explained how outdated systems hinder data collection and analysis for HTA. One participant noted:

> *"Our technological infrastructure is not equipped for comprehensive HTA. We don't have the advanced data collection or analysis tools needed to perform thorough assessments. Most of our systems are still paper-based, which makes it difficult to gather and process the necessary information for HTA." (Participant 8, Hospital Administrator).*

Another participant described how the lack of digital tools limits the scope of HTA:

> *"The lack of digital tools and platforms for data analysis is a major bottleneck. Without these, we can't efficiently analyze the large datasets required for meaningful HTA." (Participant 18, Health Informatics Specialist).*

Knowledge and awareness gaps

Limited awareness among Decision-Makers

Many participants noted that decision-makers lack awareness of HTA's potential benefits. They explained how this lack of understanding leads to underutilization of HTA. One participant stated:

> *"There's a general lack of awareness among decision-makers about HTA. Many still view it as a techni-*

cal exercise rather than something that can improve decision-making. Without a better understanding of its benefits, especially among senior policymakers, HTA will continue to be underutilized." (Participant 2, Director of Health Services).

Another participant emphasized the need to demonstrate the value of HTA to decision-makers:

"Decision-makers often don't see the value of HTA because they don't understand how it can help them make better decisions. This lack of awareness is a major barrier to its adoption." (Participant 12, Public Health Manager).

Insufficient training and education

The lack of formal education and training in HTA was also identified as a barrier. Participants explained how this gap limits the capacity of healthcare professionals to use HTA effectively. One participant noted:

"HTA is barely covered in our educational system. Most health professionals, including senior management, have little to no formal training in this area. Without proper education and training programs, it's difficult to expect them to integrate HTA into their decision-making processes." (Participant 5, Policy Researcher).

Another participant highlighted the need for practical training programs:

"We need more training programs that focus on HTA methodologies and their application in real-world settings. Without this, even those who are interested in HTA struggle to use it effectively." (Participant 17, Health Social Worker).

Preference for traditional methods

Participants indicated that decision-makers often rely on traditional methods rather than HTA. They explained how this preference stems from a resistance to change and a lack of familiarity with HTA. One participant stated:

"A lot of decision-makers prefer sticking to traditional methods of decision-making—relying on their intuition or experience—rather than using HTA. They see HTA as too technical or an unnecessary step in an already complex process." (Participant 4, Health Systems Coordinator).

Another participant described how cultural resistance hinders the adoption of HTA:

"There's a cultural resistance to HTA because it challenges the way things have always been done. Decision-makers are comfortable with the status quo and hesitant to adopt new approaches." (Participant 21, Health Management Consultant).

Data and evidence gaps

Lack of reliable data

Participants consistently mentioned the lack of reliable data as a major barrier. They explained how incomplete or outdated data limits the accuracy and relevance of HTA. One participant noted:

"The biggest issue with conducting HTA here is the lack of reliable data. Much of the data we need is either incomplete or outdated, making it difficult to perform accurate assessments." (Participant 1, Senior Health Policy Analyst).

Another participant emphasized the need for better data collection systems:

"Without reliable data, HTA becomes more of an academic exercise than a practical tool for decision-making. We need better systems for collecting and maintaining up-to-date health data." (Participant 7, Health Services Consultant).

Limited local evidence base

A further challenge identified was the limited local evidence base for conducting HTA in Iran. Participants highlighted that while global data may be available, it often does not reflect the unique health needs and context of the Iranian population. One participant shared:

"We often rely on international studies, but they don't always apply to our local context. There's a huge gap in local evidence, especially when it comes to diseases and treatments that are more prevalent here." (Participant 10, Senior Research Fellow).

Another participant elaborated on the difficulties this presents:

"The lack of a solid local evidence base makes it challenging to tailor HTA findings to the specific needs of our healthcare system. We need more research that focuses on the local health landscape." (Participant 20, Health Policy Planner).

Challenges in data sharing

Data sharing between institutions was also identified as a challenge. Participants explained how the lack of

collaboration hinders comprehensive HTA. One participant stated:

> *"Data sharing between institutions is extremely difficult. Each organization holds onto its data, and there are no clear guidelines on how to share it. This lack of collaboration makes conducting comprehensive HTAs nearly impossible." (Participant 8, Hospital Administrator).*

Another participant described the frustrations of accessing data:

> *"The lack of data-sharing protocols is a major barrier. Even when data is available, getting access to it can be a lengthy and frustrating process." (Participant 11, Health Policy Advisor).*

External factors

Political and economic influences

Political instability and policy shifts

Participants frequently mentioned political instability as a barrier to HTA adoption. They explained how frequent changes in leadership disrupt long-term initiatives like HTA. One participant noted:

> *"Political instability has a huge impact on HTA adoption. Every time there's a change in leadership, health policies shift, and long-term initiatives like HTA are often deprioritized. We make progress with one administration, but when the political landscape changes, it feels like we're starting over." (Participant 4, Health Systems Coordinator).*

Another participant emphasized the lack of continuity in HTA initiatives:

> *"The lack of political continuity makes it difficult to sustain HTA initiatives. Just as we start to make progress, a new administration comes in with different priorities, and we have to start from scratch." (Participant 16, Chief Medical Officer).*

Economic pressures

Economic pressures were also cited as a significant challenge. Participants explained how budget constraints prioritize short-term needs over long-term investments like HTA. One participant stated:

> *"HTA requires an upfront investment, but given the current economic situation, decision-makers are more focused on short-term budget concerns. They see HTA as too resource-intensive and aren't willing to allocate the necessary funds, even though HTA could lead to long-term savings." (Participant 6, Public Health Educator).*

Another participant highlighted how economic pressures undermine evidence-based decision-making:

> *"Economic pressures force us to prioritize immediate needs over long-term investments like HTA. This short-term thinking undermines our ability to build a sustainable evidence-based healthcare system." (Participant 20, Health Policy Planner).*

Influence of interest groups

The influence of powerful interest groups emerged as another significant barrier to the adoption of Health Technology Assessment (HTA) in Iran. Participants noted how these groups, often with economic or political clout, play a pivotal role in shaping healthcare policy, sometimes undermining evidence-based decision-making. Many participants indicated that certain stakeholders, such as pharmaceutical companies, medical device manufacturers, and healthcare providers, may push for the approval and funding of technologies that align with their interests, regardless of their cost-effectiveness or long-term impact. One participant explained:

> *"Interest groups have a strong influence on health policy. Pharmaceutical and medical device companies often lobby for the approval of their products without considering the long-term financial or health consequences. This leads to policies that benefit these groups rather than the public health system as a whole." (Participant 11, Health Policy Advisor).*

Another participant expressed frustration with the political and economic pressure these interest groups exert on decision-makers:

> *"Interest groups often have a disproportionate impact on healthcare decisions. They tend to focus on their own financial gain rather than the overall health of the population. This creates an environment where the adoption of HTA becomes secondary to maintaining favorable relationships with these groups." (Participant 2, Director of Health Services).*

Ethical and equity challenges

Ethical issues in Decision-Making

Some participants expressed concerns about the ethical implications of HTA. They explained how cost-effectiveness considerations can conflict with patient needs. One participant noted:

"There's a fear that HTA could justify limiting access to certain treatments because they're deemed too expensive, even if they could benefit some patients. This raises ethical concerns about whose needs are being prioritized in the decision-making process." (Participant 4, Health Systems Coordinator).

Another participant emphasized the need to balance cost-effectiveness with ethical considerations:

"HTA can sometimes lead to decisions that prioritize cost-effectiveness over patient well-being, which raises serious ethical questions. We need to ensure that ethical considerations are central to the HTA process." (Participant 19, Health Services Researcher).

Equity in resource allocation

Equity concerns were also raised, particularly regarding rural-urban disparities. Participants explained how HTA could exacerbate existing inequalities. One participant stated:

"HTA could widen the gap in healthcare access between urban and rural areas. More resources might be allocated to urban areas because they have larger populations, while rural areas, which are already underserved, could be further left behind." (Participant 3, Clinical Nurse Manager).

Another participant highlighted the need to address rural-urban disparities in HTA:

"We need to ensure that HTA doesn't exacerbate existing inequalities. Rural areas often get overlooked in decision-making, and HTA could make this problem worse if we're not careful." (Participant 15, Director of Health Programs).

Public perception and trust

Participants also noted public mistrust of HTA. They explained how this skepticism stems from a lack of transparency and communication about HTA's benefits. One participant stated:

"There's a lot of public mistrust when it comes to HTA. People see it as a way for the government to cut costs, rather than as a tool to improve healthcare. More transparency and communication about what HTA is and how it benefits patients is needed to gain public trust." (Participant 2, Director of Health Services).

Another participant emphasized the importance of public engagement:

"Public skepticism about HTA is a major barrier. If people don't trust the process, they're less likely to support the decisions that come out of it." (Participant 23, Health Policy Consultant).

Discussion

This study explored the challenges to utilizing HTA in health system decision-making in Iran, revealing a wide range of challenges that resonate with those reported in other settings globally. Our findings indicate that these challenges are multi-faceted, encompassing institutional, resource-related, political, and ethical issues that are complex to address. By emphasizing these interconnected challenges, this study adds a unique perspective on how HTA challenges in Iran are shaped by its specific socio-political and economic landscape.

One notable finding was the variation in perspectives based on participants' roles and responsibilities. Policymakers tended to emphasize structural and bureaucratic constraints, while healthcare professionals highlighted knowledge gaps and resistance to change. Academic researchers, on the other hand, were more concerned with the lack of reliable data and research funding. This variation underscores the need for tailored strategies that address the unique concerns of different stakeholder groups.

One of the most prominent challenges identified was the lack of clear policies and guidelines for integrating HTA into decision-making processes, which aligns with findings from other LMICs [9]. For instance, a study conducted in Thailand highlighted similar institutional weaknesses, particularly the absence of a standardized national framework, which resulted in inconsistent application of HTA across healthcare departments [25]. The bureaucratic constraints and the lack of institutional support reported by Iranian participants are also echoed in studies from other LMICs, such as in India, where slow administrative processes and lack of political will similarly hinder HTA adoption [26]. This underscores the critical need for a unified national framework that ensures consistent HTA application across all healthcare sectors in Iran.

Resource limitations were another major obstacle in Iran, with financial, human, and technological infrastructure gaps being significant. This challenge mirrors the experiences of many LMICs, where limited budgets and a scarcity of trained professionals have often prevented the effective execution of HTA [27]. Countries like Kenya and Uganda, which have introduced HTA frameworks, have also reported that human resource shortages and

insufficient financial support impede the full implementation of HTA [28, 29].

The mechanisms underlying these challenges appear to be rooted in systemic budget constraints, where HTA funding competes with other pressing healthcare expenditures. Additionally, the lack of career incentives for HTA professionals discourages specialization in this field, leading to a persistent shortage of trained personnel.

Notably, even high-income countries such as Australia and Canada, despite their more established HTA systems, have encountered resource limitations, though the scale of these issues is less severe [30, 31]. For Iran, strategic investments in training programs and infrastructure development, particularly in underserved areas, could play a transformative role in addressing these challenges.

Knowledge and awareness gaps were highlighted in this study, with limited understanding of HTA among decision-makers and a preference for traditional decision-making methods. This challenge is not unique to Iran; studies from several regions, including Southeast Asia and Sub-Saharan Africa, have similarly reported a lack of awareness about HTA among healthcare professionals and policymakers [1, 32]. Training programs aimed at increasing awareness and understanding of HTA are critical to overcoming this barrier. Countries such as South Korea have successfully implemented HTA training initiatives, which have significantly improved the integration of HTA into policy decisions [33].

Our findings suggest that the lack of HTA knowledge stems from both insufficient exposure in medical education and limited engagement with international HTA networks, restricting opportunities for cross-learning and knowledge exchange.

In Iran, introducing structured educational modules on HTA in medical and public health curricula could foster a culture of evidence-based decision-making and bridge knowledge gaps.

Political and economic influences were also found to be significant challenges, with political instability and policy shifts affecting the long-term adoption of HTA [34]. Economic pressures, particularly in the context of Iran's current financial challenges, were cited as major reasons for the reluctance to invest in HTA [3]. Similar findings have been reported in Brazil and Argentina, where political changes and economic crises have disrupted efforts to institutionalize HTA in healthcare decision-making [35, 36]. In contrast, countries with more stable political environments, such as the United Kingdom, have been able to maintain long-term HTA programs, contributing to more sustainable and evidence-based healthcare decisions [9]. Addressing these challenges in Iran may require creating bipartisan policies that safeguard HTA initiatives from political fluctuations and ensure financial stability.

Data and evidence gaps were a recurring theme in this study, with participants highlighting the lack of reliable and locally relevant data. This problem is not isolated to Iran; many LMICs face similar challenges [18]. A lack of robust health data infrastructure has been cited as a critical barrier to HTA in countries such as South Africa and Nigeria, where inadequate data collection systems limit the ability to generate local evidence for HTA [32]. Even in more developed HTA environments, such as those in Europe, issues around data sharing and the use of non-standardized data sources have been reported as challenges to the effective implementation of HTA [35]. Investing in digital health systems and establishing clear inter-organizational data-sharing protocols could address these gaps and enhance the credibility and utility of HTA in Iran.

Ethical and equity concerns raised by participants in Iran also resonate with international experiences [37]. In several countries, there is an ongoing debate about the potential ethical implications of using HTA to prioritize cost-effectiveness over patient care [30]. There has been public concern that HTA could justify the exclusion of expensive but life-saving treatments for vulnerable populations [35, 38]. Equity concerns, particularly related to rural versus urban resource allocation, are also shared by other LMICs where there is a risk that HTA could exacerbate existing health inequities if not carefully managed [26, 34]. Ensuring that equity assessments are embedded within HTA frameworks and prioritizing underserved populations in policy decisions are crucial for addressing these concerns in Iran.

Interestingly, public mistrust of HTA, as highlighted by Iranian participants, has also been reported in high-income countries [30]. In Canada, public skepticism towards HTA has been noted, where it is sometimes viewed as a tool for cutting healthcare costs rather than improving healthcare quality [30]. To address this, several countries have focused on improving transparency and public engagement in HTA processes, as seen in the UK's National Institute for Health and Care Excellence (NICE) system, which involves patients and the public in its decision-making processes to build trust [27, 30, 39]. For Iran, fostering public trust through regular communication campaigns and participatory decision-making forums could enhance the acceptance and impact of HTA.

Limitation

This study has several limitations that should be acknowledged. Given the qualitative nature of this research, findings are based on participants' perceptions, which may be influenced by their professional roles and institutional affiliations. Policymakers, healthcare professionals, and researchers may have different priorities and

perspectives on HTA, shaping their responses. Additionally, participants' responses may have been influenced by their current roles or responsibilities, potentially affecting the objectivity of the findings. While efforts were made to include diverse perspectives, the sample may not fully represent all stakeholders involved in HTA implementation, particularly those from rural or underrepresented healthcare sectors. The research primarily focused on institutional, resource-related, and knowledge gaps, leaving less room to explore other dimensions such as cultural factors or informal decision-making networks, which could also play a significant role in HTA utilization.

Challenges related to data availability and reliability in Iran may have further influenced the research findings. If participants lacked access to complete or current data in their HTA-related work, this may have limited their ability to provide a comprehensive perspective on the challenges. Future research could benefit from a mixed-methods approach that integrates quantitative data to complement qualitative findings and provide a more holistic view of HTA challenges in Iran.

The study predominantly addresses the challenges to HTA implementation but offers limited insight into practical solutions or strategies for overcoming these challenges. Expanding the scope to include detailed policy recommendations and action plans could enhance the utility of future research for policymakers. Finally, it is important to note that the data collection occurred between March 2024 and June 2024. Given the rapidly shifting political and economic landscape in Iran, the challenges identified in this study may evolve, potentially affecting the relevance of the findings in future contexts or under different political or economic conditions. Recognizing these limitations provides a more balanced view of the study's contributions and helps frame the results within their appropriate context.

Policy implications

Addressing the challenges to HTA implementation in Iran requires actionable strategies that align with the country's unique socio-political and economic context. This study highlights several policy recommendations to facilitate the integration and effective utilization of HTA in healthcare decision-making. First, strengthening institutional frameworks is critical. This can be achieved by developing a centralized national HTA body to standardize guidelines and ensure consistent application across all healthcare sectors. Additionally, fostering collaboration between healthcare institutions and government agencies can help build a unified approach to HTA, ensuring that all stakeholders are aligned in their efforts to promote evidence-based decision-making.

Investing in capacity building is another essential step. Implementing targeted training programs for policymakers, healthcare professionals, and HTA experts can enhance their understanding and application of HTA methodologies. Furthermore, integrating HTA education into medical and public health curricula can build a pipeline of skilled professionals who are equipped to lead and support HTA initiatives in the future.

Enhancing data infrastructure is also crucial for the successful adoption of HTA. Establishing robust digital health systems for comprehensive data collection, sharing, and analysis can address the current gaps in data availability and reliability. Creating inter-organizational protocols to facilitate data sharing can further improve the quality of evidence used in HTA processes, ensuring that decisions are based on accurate and up-to-date information.

Promoting equity and transparency in HTA processes is vital to gaining public trust and ensuring fair resource distribution. Embedding equity assessments into HTA evaluations can help prioritize underserved populations and reduce disparities in healthcare access. Increasing public participation in HTA processes through forums, workshops, and transparent communication campaigns can also build trust and acceptance, ensuring that HTA is seen as a tool for improving healthcare rather than cutting costs.

Securing financial sustainability is another key recommendation. Advocating for dedicated funding streams for HTA initiatives can insulate them from political and economic fluctuations, ensuring long-term support. Developing cost-sharing mechanisms between government and private sectors can further support investments in HTA, making it a sustainable component of healthcare decision-making.

Finally, establishing political commitment is essential to safeguard HTA programs from policy shifts and ensure continuity. Formulating bipartisan policies can protect HTA initiatives from changes in leadership, while highlighting the long-term cost savings and health outcomes achievable through evidence-based HTA can garner support from policymakers. By implementing these recommendations, Iran can overcome the challenges identified in this study and harness the full potential of HTA to improve healthcare decision-making and resource allocation. These strategies can also serve as a model for other LMICs facing similar challenges, contributing to a more equitable and efficient global health landscape.

Conclusion

This study identifies key challenges to the effective use of HTA in Iran, compounded by its unique political and economic context. While many of these challenges are shared by other LMICs, addressing them requires

strengthening institutional frameworks, increasing resources, improving data infrastructure, and enhancing HTA awareness among decision-makers. Additionally, fostering public engagement and ethical oversight is critical to ensure HTA processes are transparent, equitable, and accepted. Involving the public and addressing ethical concerns will help build trust in HTA, positioning it as a tool for improving healthcare rather than simply cutting costs. Overcoming these challenges will require sustained commitment from policymakers, healthcare professionals, and the public. By adopting a comprehensive and inclusive approach, Iran can optimize healthcare decision-making, resource allocation, and access to health technologies. These efforts can also serve as a model for other LMICs, contributing to a more evidence-based and equitable global health landscape.

Abbreviations

HTA	Health Technology Assessment
LMICs	Low- and middle-income countries
COREQ	Consolidated criteria for reporting qualitative research

Supplementary Information

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Supplementary Material 1: Supplementary File 1. Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist. Supplementary File 2: Interview Guide.Supplementary File 2: Interview Guide.

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Author contributions
MeysamB, MY, SA, and AB contributed to the development of the idea for this article. MeysamB, AB, MM, SS, and MasoudB partook in the acquisition and analysis of data. All co-authors joined them in critically interpreting and discussing the data. MasoudB, SS, and MM wrote sub-sections of this article and provided input into further sub-sections of the article, along with MasoudB, MeysamB, AB, MM, SA, MY, and SS. All authors have critically revised content, have approved the submitted version of this article, and are accountable for the accuracy or integrity of any part of the work.

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Data availability
The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
The study was approved by the ethical committee at Lorestan University of Medical Sciences (IR.LUMS.REC.1402.310). All the respondents were explained about the study and asked to sign the informed consent before confirming their participation. Written informed consent was obtained from each study participant before initiating each key informant interview. Verbal informed consent was obtained from each participant before initiating the study. The study procedures and methods were conducted in accordance with the ethical principles and guidance in the World Medical Association Declaration of Helsinki.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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