Identification of Effective Factors on Public Oversight of Public Policies with a Crowdsourcing Approach Using Thematic Analysis and DEMATEL Techniques

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A B S T R A C T

Objective: The primary goal of this article is to identify the factors influencing public oversight of public policies using a crowdsourcing approach with thematic analysis and DEMATEL techniques.

Methodology: The research methodology is mixed (qualitative-quantitative). In addition to documentary studies, thematic analysis technique has been utilized. The statistical population in this study comprised all experts in the field of public policy-making, managers, and public health professionals, with theoretical saturation achieved after 16 interviews. Eventually, basic, organizing, and global themes were extracted, and in the quantitative part, the DEMATEL technique was used to determine the impact and influence of factors on public oversight of public policies with a crowdsourcing approach.

Findings: This study identified 15 dimensions (health service capacities, motivational factors, environmental factors, internal policies, domestic infrastructure, executive factors, development and education of public services in health, development of domestic services, globalization of public services, development of knowledge sharing policies and services, structural issues, laws and regulations, cultural factors, financial management) and 32 components and 159 indicators were extracted. Through the DEMATEL method in the quantitative section, 8 influential components and 7 influenced components were identified.

Conclusion: The studies indicated that among the identified dimensions, the dimension of health service capacities has the highest importance in terms of impact and requires special attention, while the dimension of cultural factors is the most influenced dimension that is affected by other dimensions.

Keywords: *Model Public oversight, Public policy, Crowdsourcing, Health sector.*

1   Introduction

Today, with the emergence of problems such as various forms of corruption, low performance levels of some government organizations, and discrepancies between goals and achievements of programs, researchers in public administration management have turned their attention to the issue of oversight to address these deficiencies (Ebadi & Rezaei, 2018). In the oversight process, by monitoring activities and comparing them with established criteria and standards, deviations and inefficiencies are identified, and timely feedback leads to corrections and ultimately the purification and enhancement of system performance (Rezabeygi et al., 2021).

One of the crucial subsystems that must be considered in the design of any system is the monitoring and oversight system, which is fundamentally linked to the formation, stability, continuity, and dynamism of any system (Banerjee & John, 2024). In the governance structure of our country as well, organizations and institutions have been designed and defined to oversee the administrative system and political structure. There are types of oversight including formal and informal oversight (Cerf et al., 2024). Formal oversight is defined by law as a duty performed by the government, parliament, or affiliated executive agencies and institutions. The Audit Organization, Accountancy, Court of Audit, General Inspection Organization, courts, and judicial organizations, and the Article Ninety Commission of the Islamic Consultative Assembly are examples of formal oversight organizations in the country (Priadi et al., 2024).

The second type of oversight, informal oversight, is not legally and formally required. In informal oversight, various groups of people, parties, associations, private organizations, and generally all members of society engage in monitoring policies and provide opinions and reports regarding a policy. This type of oversight is achieved through the conviction of human beliefs and is related to the worldview, thought, and ethics of individuals. Media, press, and stakeholder groups perform informal oversight (Awotunde et al., 2024).

Some limitations include resource constraints, lack of information, and the absence of efficient communication networks, which have prevented oversight institutions from fully performing their mission (Muthomi & Thurmaier, 2021). Sometimes policymakers and politicians, rather than wanting to understand the real conditions of society and witness the results of their decisions, try to conceal their personal goals and mislead public opinion (Charalabidis et al., 2012).

Transparency and access to information are essential for revising programs and changing priorities in any oversight (Eynali et al., 2022; Muthomi & Thurmaier, 2021; Tiglao et al., 2023). When an institution or organizational unit responsible for an activity also oversees and evaluates it, the credibility of the oversight results is questioned (Rezabeygi et al., 2021). Today, oversight methods have changed over time in line with changes in management patterns. With the paradigm shift from the traditional model of administration to modern public management in the second half of the 20th century and subsequent changes, the use of public capacity in decision-making, policy-making, administrative management practices, and public administration has been prioritized. As societies' problems have become more complex, the participation of the public and the use of people's opinions have increasingly attracted the attention of governments (Charalabidis et al., 2012). Thus, public participation and its capacities can be utilized in areas such as public policy-making, planning, public budgeting, and service delivery (Rezabeygi et al., 2021). In the issuance of the general policies of Article 44 of the Constitution and also in the issuance of the general policies of the resistance economy, enhancing public participation in the economic prosperity of the country has been considered a basis. In line with the use of public participation capacities, today the design and solving of organizational problems are not limited to experts and small groups, but even large and diverse groups with less knowledge perform these tasks better. On the other hand, advances in information technology have led to the creation of new methods of attracting public participation, one of which is crowdsourcing (Zolfagharzadeh & Shahsavari, 2019).

Crowdsourcing refers to a method in which the knowledge and intelligence of non-experts lead to the solution of complex problems that organizational experts are unable to solve. Crowdsourcing is based on the concept of collective intelligence, meaning that under the right conditions, groups are often smarter than the smartest individuals in those groups (Morozova, 2015). The concept of crowdsourcing does not mean connecting with people but rather involving people. Connecting with people at the lowest level means providing information from top to bottom, and at the highest level, it means receiving information from citizens (Ongaro, 2022). Therefore, efforts should be made to ensure that the connection between people and the government is not merely about sharing and

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exchanging information but rather facilitating collaboration between the public and the government (Nalluri et al., 2024). The structure of crowdsourcing has a formal and central core that involves a collection of often unspecified individuals connected to this core. The core of crowdsourcing is formally tasked by an organization or institution to perform a task or solve a problem and tries to find a suitable solution and solve the problem by sharing it through a call for participation. During the activity, the core of crowdsourcing specifies the direction and orientation of the participants' activities. The socio-political role of crowdsourcing expands a space where officials and citizens interact. An interaction that leads to the introduction of political innovations and the development of new forms of civil and political participation (Tiglao et al., 2023). Politicians and policymakers try to use the capacities of public participation to fulfill governance goals. In a political space, public programs and policies are formulated and implemented to secure public interests. Providing public benefits is a fundamental pillar of public services (Van Roy et al., 2024). Public services mean providing some services by the government to citizens, which may be performed directly by the government itself or supported by the government from the private sector. The government has the responsibility to protect and provide public benefits, and due to the connection of public services with public interests, the provision of public services is carried out with government intervention (Gupta & Katarya, 2020). The main feature of public services is their availability to everyone. Education, health care, energy, and public transportation are among these services. Given the issues mentioned, health policies and services provided in this area are considered part of public services. According to the law, the Ministry of Health, Treatment, and Medical Education is responsible for policy-making, implementation, and monitoring of public health policies. Health policy refers to decisions, programs, and actions taken to achieve specific goals regarding health care within a community. Health is repeatedly mentioned as an important issue in the Constitution of the Islamic Republic of Iran, specifically in Principles 3, 29, 43 of the Constitution, and also in Section 14 of the Sixth Development Plan, where the health of the community, health care, and treatment of all individuals are considered in detail. The Supreme Leader also issued the general health policies on April 7, 2014, so that this area would receive more attention from policymakers than before. In the Vision Document of 2025, Iran is a developed country with the leading economic, scientific, and technological position in the region, characterized by

features such as health, welfare, food security, social security, and a desirable environment. Due to the central importance of health in sustainable economic, social, and cultural development in the country's vision plan, the improvement of health indicators to achieve the leading position in Southwestern Asia is emphasized (Ramzankhani et al., 2018). However, achieving the stated goals is not solely realized through the formulation and implementation of related policies but requires precise monitoring at every stage of policy-making to identify any deviations and provide timely feedback. This oversight begins simultaneously with policy implementation and continues until its completion. Given the importance of health, some of the major policies in this area will be selected as the subject of this study to be examined. However, providing public services in any field is always accompanied by problems. Public services have such a nature that they cannot fully connect to reality without governmental intervention, and the basis for granting sovereignty to the government is the provision of public services, and public service is the main mission of administration (Bidwell & Schweizer, 2021). Although various methods of public participation are employed by politicians and policymakers to increase the level of public services, there are still some shortcomings in the provision of public services. The shortcomings in the provision of public services have extensive consequences for any government (Taylor et al., 2008). Identifying and addressing these shortcomings requires an efficient oversight system. In the field of oversight, public participation has created a concept called public oversight, both in practice and in theory, which has gained an important place in oversight practices and studies and theoretical developments (Rezabeygi et al., 2021). Despite the research conducted in the field of public oversight and public participation, some challenges still preoccupy the minds of researchers in the field of public management. Conflicting views are expressed regarding the two issues of oversight and public services, which require further research in this area to understand and provide a new methodology to align these two fields (Pourkiani et al., 2021). Despite the interest of scholars in the concepts of public participation and public oversight, there is no consensus or agreement on the nature and purpose of these concepts (Gheisari et al., 2019). Although numerous studies have been conducted on general concepts and various forms of public participation and public oversight, there is still much work to be done in the practical world and in the real world to explain and describe these concepts due to their increasing complexity

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(Shybalkina, 2022). More than four decades since the concept of public participation and public oversight in its modern form was proposed, aimed at increasing legitimacy and capacity building for better decision-making, its implementation in different parts of the world has had mixed results (Webler & Tuler, 2021). The emergence of new challenges related to the complete success of the concepts of public participation and public oversight in fulfilling the intended goals, in the realm of implementation and action, due to reasons such as the preference for individual benefits over collective ones by participants or unequal opportunities for participation, highlights the need for rethinking and revising the course of studies conducted in this area (Webler & Tuler, 2021). Although the inclination towards public participations and public oversight and research around it initially gained strength from public dissatisfaction with government performance, despite the abundant quantity of such studies, few researches have been conducted on explaining the effectiveness and practical success of public participation oversight in achieving goals such as improving the state of democracy and gaining public satisfaction (Webler & Tuler, 2021). Regardless of the method of implementation of oversight, the results obtained from it help policymakers and policymakers to identify existing deviations and flaws in the implementation of policies and programs and take steps to rectify them. Although valuable efforts have been made in this field of study so far, there are still numerous research topics, gaps, and issues, especially from a local perspective and considering the structural, cultural, political, and social characteristics of the country in this field, which the present research intends to discover and introduce the neglected aspects and unknown dimensions of it. Ultimately, the best strategies in this field will be identified and introduced, and a model of public oversight of public policies with a crowdsourcing approach in the field of public services will be presented to increase the level of public services. In light of the points mentioned in the above section, it is possible to briefly emphasize some points and the gaps in question, which explain the problem of the current research:

Most countries in the world today are involved in an important issue such as public services and always need public oversight over them because experience has shown that whenever a particular agency or organization takes on the responsibility of oversight, it ultimately leads to disruption and a rift between the organization and employees and sometimes causes strange violations. Therefore, for each

service, countries need to provide public policies from delivery to oversight.

Another point that researchers (as mentioned in the above sections) emphasize is that the two concepts of public oversight of policy-making and public services should always be discussed together. As Van Roy and colleagues (2024) have stated, without continuous monitoring and provision of public policies, it is not possible to identify deviations in development programs and formulate corrective programs in this regard (Van Roy et al., 2024). In other words, public oversight based on the programs and planning that has been done should be managed satisfactorily and ultimately provided in the form of public services. However, a research gap in this area has made achieving this difficult. This research gap, as other researchers have mentioned, is the lack of a comprehensive and generalizable theoretical model that can include the main components and indicators in public oversight of public policies (Gheisari et al., 2019; Pourkiani et al., 2021).

Another challenge that has been mentioned is the lack of generalizability of models of public oversight of public policies with a crowdsourcing approach in the field of public services from private organizations to government organizations. According to the views of researchers such as Pourkiani and colleagues and Gheisari and colleagues, the capabilities and requirements that government organizations have are different from a private organization, and this very fact causes the findings obtained from private organizations to be uncertain in their generalizability for government organizations (Gheisari et al., 2019; Pourkiani et al., 2021). In other words, the evidence obtained shows that the findings obtained from private organizations cannot necessarily be considered for government organizations providing public services. This is important from two aspects. First, the potentials and capabilities that the government has to support public services in most government organizations are very different from a private company. Second, given the knowledge complexity that some government organizations have, such as hospitals that provide medical services or health and wellness houses that mostly handle health services, it should be stated that the background factors and methods and actions required to improve public oversight are different from a private organization, and this necessitates conducting independent and separate research in this area (Gheisari et al., 2019; Pourkiani et al., 2021).

The last research gap that can be mentioned focuses on the lack of a comprehensive and extensive theoretical model that simultaneously includes all three components of interest

to researchers, namely public oversight, crowdsourcing, and public services. In other words, studies that have directly and independently addressed the examination of indicators and background factors affecting public oversight of public policy-making with a crowdsourcing approach in the field of public services have not been observed and should be based on an appropriate approach such as thematic analysis, especially with an emphasis on the current conditions of public services in the health sector, to present and identify the key indicators and factors in this area that have previously been overlooked and not presented. The sum of the mentioned points has led the researcher to try to answer the main question in the present study, which is what are the effective factors on public oversight of public policies with a crowdsourcing approach in the field of public health and what are the influential and influenced factors?

2   Methods and Materials

This study employs a mixed-method approach (quantitative and qualitative). In the qualitative phase, primary components were identified using semi-structured interviews through thematic analysis. Participants included public policy experts, managers, and public health specialists who have relevant academic degrees or have published articles, books, or have taught in this field. Entry criteria for the study were experts with at least three years of university experience in public health, specialists with at least a doctoral degree in public administration or public health, and titles related to the research. Sampling was purposive. According to Tashakkori and Teddlie (2003), in this sampling method, cases are selected non-randomly and with specific purposes. Data collection for gathering quantitative data was performed using a matrix questionnaire to investigate the influencing and influenced variables via the Decision-Making Trial and Evaluation Laboratory method (DEMATEL) among a statistical population of 21 experts. The sampling method was snowball. Interviews were conducted from winter 2022 to early summer 2023. The average duration of the interviews was 73 minutes. After transcribing the interviews, to analyze the data, the method of thematic analysis was employed concurrently with data collection. After conducting the interviews, the recordings were first transcribed. Subsequently, a copy of the extracted codes was sent to and confirmed by the interviewees. For familiarization and immersion, the data were read multiple times, whereby primary themes were identified and similar primary themes

were grouped into categories. These categories merged to form the sub-themes. Also, to ensure the accuracy of the collected data, there was prolonged and deep engagement with the data. In addition, two other researchers, besides the principal researchers, participated in the data analysis. The researchers read the manuscripts for coding confirmation and category formation. To increase confirmability, the participants were re-consulted. Having maximum variety in sampling and prolonged visits were other ways to increase data validity. From the initial interview, sub-themes and categories were formed, and then data reduction continued across all units of analysis (themes) until the emergence of sub-themes. The interviews continued until data saturation was achieved. Qualitative content analysis was conducted using MAXQDA12 software. DEMATEL is a method used to examine the effect of each variable on other variables and to identify the influencing and influenced components in the variable of public oversight of public policies with a crowdsourcing approach in public health to make the overall goals of the research feasible. The decision-making model can determine the relationship between indices that are individually or collectively interdependent. DEMATEL analyzes the relationship between indices by dividing the criteria into influencing and influenced parts. In this study, informed consent, preservation of identity information, and adherence to confidentiality in transcribing interview content were considered ethical considerations.

3   Findings and Results

First question: What are the factors affecting public oversight of public policies with a crowdsourcing approach in public health?

To answer this question, interviews were designed with semi-structured questions and conducted with experts and managers in public health. Of the total 16 expert participants in this study, 11 were faculty members in public administration fields, 3 were senior managers at the Ministry of Health, and 1 was from the Red Crescent. A qualitative content analysis process was used to identify the factors affecting public oversight of public policies with a crowdsourcing approach in public health. In this process, 536 initial codes were extracted. With multiple reviews and merging codes based on similarity through several stages, finally, 32 components for public oversight of public policies with a crowdsourcing approach in public health and 15 main themes (primary factors) (as shown in Table 1) were extracted.

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Table 1

Factors Affecting Public Oversight of Public Policies with a Crowdsourcing Approach in Public Health

Primary Themes	Code	Organizing Themes	Code	Basic Themes	Code
Service Factors	A	Medical Insurance Services	A1	Health insurance for all travelers	A1-1
				Comprehensive insurance coverage for all health service areas	A1-2
				Monitoring of insurance service prices	A1-3
		Monitoring of Drug Distribution	A2	Drug price control	A2-1
				Drug imports for specific diseases	A2-2
				General public drug price control	A2-3
Health Service Capacities	B	Monitoring of medical and public service capacities	B1	Monitoring of modern medical equipment	B1-1
				Fast medical visa issuance through hospitals	B1-2
				Monitoring of online medical services	B1-3
				Monitoring of doctors' appointment procedures	B1-4
		Hospital capacities and specialized services	B2	Monitoring of VIP services to patients	B2-1
				Monitoring of VIP services to patient companions	B2-2
				Variety of treatment methods available	B2-3
Motivational Factors	C	Monitoring of Attraction Factors (Destination Country)	C1	Monitoring of medical costs	C1-1
				Monitoring of correct advertising in the field of health services	C1-2
				Monitoring of medical facilities	C1-3
				Monitoring of hospital equipment	C1-4
				Monitoring of natural tourist attractions (hot springs and caves)	C1-5
		Pressure Factors (Origin Country)	C2	Monitoring of high treatment costs	C2-1
				Provision of skilled doctors to develop the health sector	C2-2
				Provision of equipped hospitals	C2-3
				Provision of medical equipment	C2-4
				Determination of domestic and international policies in public services	C2-5
Environmental Factors	D	Economic Factors	D1	Attention to economic recession	D1-1
				Unemployment rate control	D1-2
				Currency fluctuation control	D1-3
				Severe price growth control	D1-4
				Attention to continuous price changes, especially in healthcare	D1-5
				Control of personal profiteering	D1-6
				Control of budget wastage	D1-7
		Political-Security Factors	D2	Determination of international security policies in the region	D2-1
				Control of sanctions	D2-2
				Prevention of kidnapping of health tourists	D2-3
				Provision of international security in the region	D2-4
				Control of internal disturbances	D2-5
				Control of domestic political actions and reactions	D2-6
				Provision of political stability	D2-7
				Provision of internal and external security	D2-8
				Control of security threats	D2-9
		Historical-Value Factors	D3	Engaging public participation in the maintenance of cultural-historical artifacts	D3-1
				Engaging public participation in the maintenance of ancient artifacts	D3-2
				Engaging public participation in the maintenance of historical attractions	D3-3
				Development of ethnic and cultural attractions through public participation	D3-4

				Engaging public participation in the maintenance of sports artifacts	D3-5
				Development of handicraft industries through public participation	D3-6
				Development and modernization of cultural and customary factors	D3-7
				Construction and development of artificial tourist attractions	D3-8
				Development of commercial attractions	D3-9
				Development of the number of public parks	D3-10
Internal Policies	E	Regional and Local Policies	E1	Holding health workshops and seminars for the public	E1-1
				Crisis management	E1-2
				Management of visits	E1-3
				Management of the impact of public services in the health sector	E1-4
		General Government Policies	E2	Uniformity among policymaking institutions	E2-1
				Importance and priority of public services in the health sector for the government	E2-2
				Coordination among public service organizations	E2-3
Internal Infrastructure	F	Large (Public) Infrastructure and Equipment	F1	Development and monitoring of administrative infrastructure and equipment	F1-1
				Development and monitoring of educational infrastructure and equipment	F1-2
				Development and monitoring of health sector infrastructure and equipment	F1-3
				Development and monitoring of technological infrastructure and equipment	F1-5
				Development and monitoring of informational infrastructure and equipment	F1-6
				Development and monitoring of infrastructure and equipment related to science and technology parks	F1-7
				Development and monitoring of cultural infrastructure and equipment	F1-8
				Development and monitoring of welfare infrastructure and equipment	F1-9
		Specialized (Sector-specific) Infrastructure	F2	Drawing up a vision and mission	F2-1
				Benefiting from an academic brand	F2-2
				Leadership in knowledge creation	F2-3
				Organizational structure for knowledge creation	F2-4
				Attention to human resource management	F2-5
				Proper management of financial resources	F2-6
				Social capital	F2-7
				Organizational learning	F2-8
				Establishment of a public service management system	F2-9
				Advertising and marketing	F2-10
Executive Factors	G	Monitoring of Public Service Providers	G1	Monitoring of access routes to medical centers	G1-1
				Monitoring of access routes to urban public services	G1-2
				Accurate identification of public service centers	G1-3
				Monitoring of "Ask Me" kiosks in cities	G1-4
				Allocation of spaces for the provision of public services by the public (street vendors, etc.)	G1-5
		Monitoring of Equitable Distribution of Public Services in Health	G2	Monitoring of the provision of private rooms in hospitals to patients	G2-1
				Monitoring of special services to patient companions	G2-2
				Monitoring of special services to patients	G2-3
				Distribution of specialist doctors across all areas	G2-4
				Presence of all specialists in cities	G2-5

				Presence of all specialists in medical centers	G2-6
				Monitoring of online social interactions	G2-9
Development and Training of Public Services in Health	H	Public Participation in the Development of Public Services	H1	Assessment of facilities and equipment by the public	H1-2
				Evaluation of city conditions in providing public services	H1-3
				Evaluation of services approved by the parliament	H1-4
				Acceptance and belief in the type of services provided	H1-5
				Internal motivation to use public services	H1-6
				Volunteer public monitoring of the type of services provided nationwide	H1-7
		Public Education	H2	Accurate dissemination of public service costs in the health sector	H2-1
				Provision of information about the type of services	H2-2
				Simulation of services before provision	H2-3
				Teaching how to monitor public services fairly	H2-4
Development of Domestic Services	I	Transportation	I1	Development of transportation networks	I1-1
				Quality and quantity of transportation networks	I1-2
				Ease of transportation	I1-3
				Facilities related to transportation for disabled and ill individuals	I1-4
				Accessibility of the transportation system at the desired time	I1-5
		Information Systems	I2	Web technology	I2-1
				Integration of internal and external systems	I2-2
				Internet status	I2-3
				IT infrastructure	I2-4
		Accommodation and Hygiene Services	I3	Quality and quantity of hotels	I3-1
				Conditions and facilities of hotels for patients and disabled individuals	I3-2
				Roadside accommodations	I3-3
				Accommodation standards for patients and companions	I3-4
				Hygiene conditions of hotels and accommodations	I3-5
				Optimal health-medical infrastructure	I3-6
				Quality of foods	I3-7
				Emergency and pharmaceutical services in accommodations and hotels	I3-8
				Natural and healthy foods	I3-9
				Service types in restaurants	I3-10
				Nutrition costs	I3-11
				Healthy local foods	I3-12
Globalization of Public Services	J	Standardization of Public Services in Health	J1	Provision of services at international standard levels	J1-1
				Equipping hotels and accommodations at international levels	J1-2
				Provision of medical services at international levels	J1-3
		Development of Information and Advertising Packages	J2	Design of introduction packages for service-providing organizations	J2-1
				Design of brochures to introduce the type of services	J2-2
				Introduction of services offered for specific individuals	J2-3
				Introduction of welfare services	J2-4
Development of Policies for Knowledge and Service Sharing	K	Knowledge Sharing at the Global Level	K1	Participation in specialized health tourism exhibitions to gain international experiences	K1-1
				Design of multilingual health tourism websites	K1-2
				Establishment of a registration system for tourists and international centers	K1-3
				Introduction of modern and traditional medical capabilities of the country's health system	K1-4

				Adoption of suitable marketing strategies from target countries	K1-4
		Development of Service Sharing Policies at the Regional and Global Levels	K2	Creation of health towns	K2-1
				Signing memorandums of understanding with Free Trade Zone organizations to develop health tourism hospitals	K2-2
				Signing memorandums of understanding with the Broadcasting Organization for advertising in the international unit	K2-3
Structural Themes	L	Technology Structures	L1	Lack of high-speed domestic internet	L1-1
				Unrestricted connection to international networks	L1-2
				Bandwidth issues of internet lines	L1-3
		Geographic Structures	L2	Urban planning issues (lack of attention to cityscape in attracting tourists)	L2-1
				Climate issues (drought)	L2-2
Laws and Regulations	M	National Laws and Regulations	M1	Visa laws for specific countries (USA, Israel)	M1-1
				Religious laws enacted in the country (hijab, alcohol, etc.)	M1-2
				Attention to the financial burden of laws in the health sector	M1-3
				Priority for enacting facilitative laws	M1-4
				Attention to the financial capacity of the population	M1-5
				Economic Commission governance during policy formulation	M1-6
		International Laws and Regulations	M2	Control of political sanctions against Iran	M2-1
				Control of insecurity in neighboring countries	M2-2
				Monitoring of international health regulations	M2-3
				Monitoring of international commitments	M2-4
				Monitoring of conflicts between domestic and foreign laws	M2-6
Cultural Factors	N	Familiarity with Global Culture	N1	Familiarization of the population with international languages (English)	N1-1
				Familiarization of the population with the cultures of other countries	N1-2
		Familiarity with National and Local Culture	N2	Addressing significant cultural differences among Iranian cities	N2-1
				Familiarity with different languages and accents in Iran	N2-2
Financial Management	O	Internal Financial System Organization	O1	Connection of Iran to international payment systems (international credit cards)	O1-1
				Development of reputable exchange offices in the city and hospitals	O1-2
		External Financial System Organization	O2	Control of financial sanctions against Iran	O2-1
				Monitoring of payment methods from outside Iran	O2-2

Research Question Two: What are the influencing and influenced factors on public oversight of public policies with a crowdsourcing approach in public health?

The average opinions of research experts can be seen in Table 2. This table consolidates the opinions of 21 experts based on the arithmetic mean.

Table 2

Direct Relationship Matrix (D) (Average opinion of 21 experts)

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
C1	0.000	2.143	2.714	2.286	1.714	2.714	2.143	2.000	2.714	2.714	2.571	3.143	2.143	3.000	2.000
C2	2.000	0.000	3.429	1.857	2.286	2.857	2.143	2.000	3.143	3.429	3.000	3.429	3.143	4.000	4.000
C3	1.857	2.286	0.000	2.143	1.571	2.571	1.714	2.429	2.857	2.571	3.000	3.286	2.571	3.000	2.000
C4	1.857	2.571	2.571	0.000	2.000	2.857	2.143	2.143	2.714	3.000	3.143	2.714	3.143	3.143	1.000
C5	2.429	2.000	3.000	2.429	0.000	3.143	1.857	2.286	3.000	2.714	2.857	3.143	2.571	3.143	3.000
C6	2.286	1.857	2.714	2.143	2.143	0.000	2.000	1.857	2.286	1.714	2.857	3.000	2.429	3.571	4.000

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C7	2.000	1.571	2.714	2.571	2.143	2.857	0.000	2.143	2.857	2.571	3.429	2.429	2.571	2.143	1.000
C8	1.857	2.143	2.714	2.714	2.000	2.571	1.571	0.000	2.571	2.714	3.429	2.714	2.714	2.857	2.000
C9	2.000	1.571	2.429	2.286	2.143	2.571	1.857	1.000	0.000	2.286	2.857	3.000	2.857	4.000	2.000
C10	2.143	2.571	3.000	2.000	1.857	3.000	2.571	1.857	2.571	0.000	2.571	2.857	3.143	3.000	3.143
C11	2.286	2.000	2.857	2.143	1.857	3.143	2.286	1.857	2.143	2.000	0.000	2.714	2.286	3.000	3.143
C12	1.857	1.857	2.571	1.857	2.000	2.571	1.714	2.286	3.143	1.000	2.286	0.000	2.714	1.857	2.714
C13	1.857	1.857	2.571	1.571	2.143	2.429	1.714	1.857	2.857	2.429	2.571	2.571	0.000	3.000	2.571
C14	2.286	2.857	2.714	2.857	3.714	2.286	2.857	3.571	3.143	3.571	2.286	2.143	1.714	0.000	3.429
C15	2.857	2.143	3.857	2.143	3.143	1.571	3.857	3.143	3.857	3.143	3.000	2.857	2.000	1.429	0.000

Normalization of the matrix was achieved using mathematical relationships with the help of formulas in Excel software. First, the sum of each row and column of the direct relationship matrix was obtained, and then the highest value among these sums was calculated, as shown in Table 3.

Table 3

Sum of Rows and Columns of the Direct Relationship Matrix

Factor	Sum of Columns	Sum of Rows
C1	29.57143	34.000
C2	29.42857	40.714
C3	39.85714	33.857
C4	31.00000	35.000
C5	30.71429	37.571
C6	37.14286	34.857
C7	30.42857	33.000
C8	30.42857	34.571
C9	39.85714	32.857
C10	35.85714	36.286
C11	39.85714	33.714
C12	40.00000	30.429
C13	36.00000	32.000
C14	41.14286	39.429
C15	36.00000	39.000
Max Value	41.143	N/A

For normalization, all entries of the direct relationship matrix are divided by 41.143. After forming the normalized matrix and the relationship matrix between components, a causal diagram was drawn.
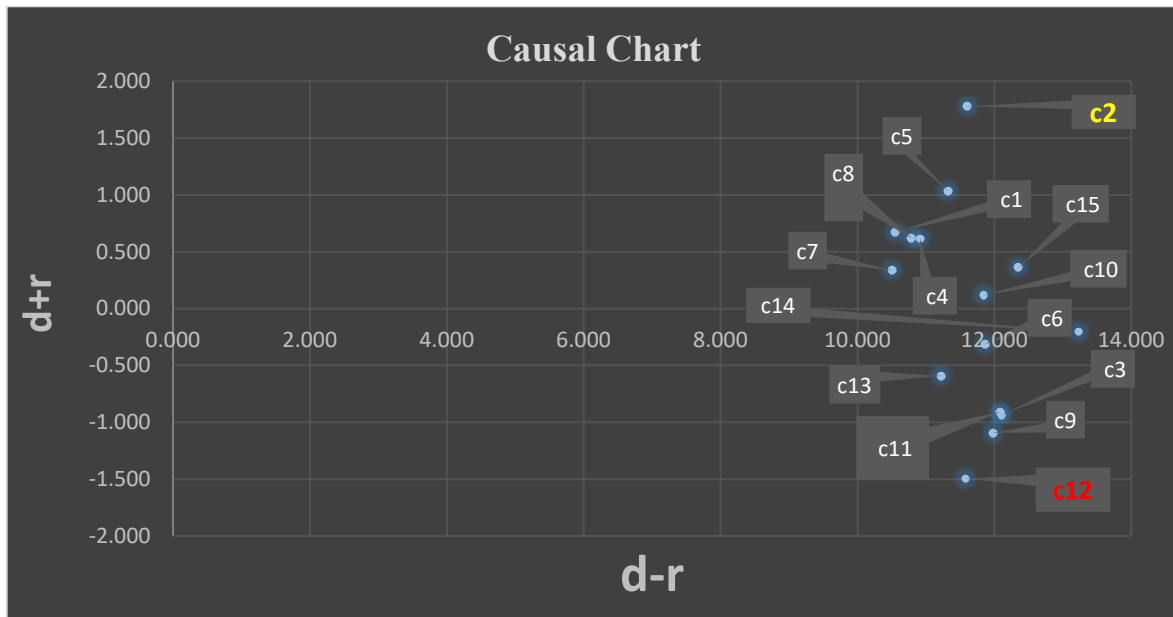
Criteria on the right side of the Y-axis having a positive D-R are causal and have more influence than they receive, which includes factors such as Healthcare Service Capacities, Domestic Policies, Service Factors, Development and Education in Public Health Services, among others.

Criteria on the left side of the Y-axis with a negative D-R are more influenced and include Structural Issues, Development of Domestic Services, etc., which have higher susceptibility to influence.

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Figure 1

Direct Relationship Matrix (D) (Average opinion of 21 experts)

4   Discussion and Conclusion

Governments, when faced with public issues and problems, inevitably need to formulate public policies. Since the implementation of policies plays a vital role in solving public problems in society, the quality of public sector management can be assessed based on the success of implementing public policies (Chen et al., 2021). Therefore, one of the responsibilities of governments is the correct implementation of public policies. The law supporting social services and crowdsourcing innovations and inventions, aimed at synergizing science and wealth, developing knowledge-based economies, achieving scientific and economic goals, including the design and production of goods and services, and commercializing the results of research and development in the field of advanced technologies with high added value, especially in the production of related software, was passed by the Islamic Consultative Assembly in 2010 (Van Roy et al., 2024). According to this law and the regulations associated with it, a significant number of ministries, organizations, and public institutions in the country have been responsible for implementing various parts of the tasks specified in this law. Therefore, considering the nature of this law as a public policy, the factors affecting its successful implementation have been studied (Amiri et al., 2023).

In recent years, through studies by experts in the field of policy, various factors have been identified and categorized as effective in implementing public policies, with different interpretations. Therefore, it is crucial that policymakers, while being aware of and attentive to these factors, strive to increase the opportunity and chance of successfully implementing a policy by realizing these factors (Ghorbanizadeh et al., 2021). The essential issue now is the importance and priority of each of these factors in implementing a policy. In other words, policymakers must assign equal significance to each set of effective factors or if their importance varies in terms of impact on successful policy implementation. Therefore, the current research aims to identify the effective factors and, with the help of existing theoretical literature, examine the importance and presence of each factor in implementing the policy supporting social services from the perspective of experts in that field (Nalluri et al., 2024).

The origin of public participation in political decision-making processes dates back to democracy in ancient Greece and has been subject to continuous changes in subsequent centuries. Typically, judgments and opinions about a policy start simultaneously with its implementation. The monitoring and evaluation of public policy became a focus of politicians and implementers in the late 1960s following initiatives by Lyndon Johnson (Awotunde et al., 2024). One of the necessities of any efficient and responsive administrative system is the presence of a monitoring and

control subsystem (Gheisari et al., 2019). Monitoring is sometimes defined as a mission for an organization and sometimes carried out voluntarily in the public interest. In the sacred system of the Islamic Republic of Iran, mutual monitoring of people and government performance is explicitly emphasized in Principle Eight of the Constitution (Eynali et al., 2022). With changes in governance styles, monitoring methods have also changed to suit current needs. Nowadays, the utilization of the full capacity of society to solve problems is a focus of policymakers. The concept of public oversight falls among concepts such as accountability, transparency, and responsibility. Public oversight is based on the acceptance of citizens' right to monitor the performance of the government and its affiliated institutions. Public oversight is a common factor and a prerequisite for realizing other governance considerations and their urban dimensions (Van Roy et al., 2024).

Accepting the assumption that public oversight of public policies with a crowdsourcing approach in public health has an impact and is influenced by various factors that, knowing the mentioned differences, must be discovered and studied. The Ministry of Health and Medical Education, as well as universities involved in the results of public oversight of public policies with a crowdsourcing approach in public health, inevitably need to acquire a fundamental and comprehensive understanding of the concept of public oversight of public policies with a crowdsourcing approach in public health, and this understanding is a fundamental prerequisite for their optimal performance in controlling and preventing unethical incidents. Therefore, so far, numerous models and theories have been presented by researchers to explain public oversight of public policies in health and how to evaluate and measure it. However, most of these models and theories lack the necessary comprehensiveness, especially since less work has been done around the crowdsourcing approach and public health. Based on this, it is imperative to recognize the factors affecting it to reach a model of public oversight of public policies with a crowdsourcing approach in public health that aligns with the needs of the Ministry of Health and Medical Education and the goals prevailing in society. One of the reasons for not addressing this important issue in recent research is the quantitative nature of many studies. In most research, positivist paradigms are more visible and the most commonly used scientific approach in recent research. In this research, we believe that if research is conducted qualitatively and utilizes top scholars in the humanities familiar with public health issues and sociological sciences

and familiar with public oversight, this concept (public oversight of public policies) will change into a measurable and tangible term and lead to the development of a theory in this regard. One of the innovative aspects of this research can be mentioned as the methods of extracting meaning and concepts related to the research topic. Because in most research, quantitative aspects are more used to extract concepts. While this research is derived from semi-structured interviews with professors and senior managers of the Ministry of Health and Medical Treatment and the Red Crescent. The use of MAXQDA and Excel software can also be considered as the use of modern world technology and technology in building the theories of this research. On the other hand, the extraction of practical dimensions and components for how public oversight of public policies with a crowdsourcing approach in public health is operational.

In this research, public oversight of public policies with a crowdsourcing approach in public health has 15 general dimensions (health service capacities, internal policies, service factors, development and education of public services in health, environmental factors, financial management, executive factors, globalization of public services, cultural factors, domestic infrastructure, laws and regulations, motivational factors, development of knowledge sharing policies and services, development of domestic services, structural issues). These have been evaluated in two parts, the first being which factors affect public oversight of public policies with a crowdsourcing approach in public health? This question led to the emergence of a new theory from 16 interviews for theme extraction and also 32 components for 51 dimensions were extracted. Also, to answer the question of which dimensions are influential and which are influenced in the field of public oversight of public policies with a crowdsourcing approach in public health, the DEMATEL technique was used, and approximately 8 dimensions were influential and 7 dimensions were influenced. Among them, the dimensions of health service capacities, internal policies, service factors, development and education of public services in health, environmental factors, financial management, executive factors, and globalization of public services are influential, and the dimensions of structural issues, development of domestic services, development of knowledge sharing policies and services, motivational factors, laws and regulations, domestic infrastructure, and cultural factors were more influenced. This part of the findings aligns with the research of Mohammadi and colleagues and Baki Hashemi and colleagues, which in some way refers to some

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of the components of this research in the field of health and mentions that the development of knowledge sharing policies can have an impact on the health of the administrative system (Baki Hashemi et al., 2021; Mohammadi et al., 2022). Also, in the oversight section of public policy in the public services sector, the results of this research are in line with the results of Amiri and colleagues and Hosseinpour and colleagues (Amiri et al., 2023).

Overall, this study showed that dimensions such as health service capacities, internal policies, service factors, development and education of public services in health, environmental factors, financial management, executive factors, and globalization of public services have a more direct and greater impact compared to other dimensions in public oversight of public policies with a crowdsourcing approach in public health, and dimensions such as structural issues, development of domestic services, development of knowledge sharing policies and services, motivational factors, laws and regulations, domestic infrastructure, and cultural factors have more influence compared to other dimensions.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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