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Determinants of Public Participation in Urban Environmental Protection: An Exploratory Qualitative Study

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ABSTRACT

Background: The environment is closely related to the interests of society, including health and hygiene, whose protection depends on public participation. It is only through support and involvement that effective outcomes can be achieved in environmental management. The purpose of this research was to identify the effective components and indicators of public participation in the protection of the urban environment.

Methods: The current research was of qualitative type in terms of data collection. First, purposeful sampling was used to select participants, and the interview process began with both theoretical and experimental experts. The interviews continued until a comprehensive understanding and description of the components and indicators were achieved and until theoretical saturation was reached. During the interviews, the information was carefully reviewed and categorized. Then, the identified items were reviewed, revised, and duplicates were excluded. Finally, the dimensions of the topic were determined, and a framework of components and indicators was presented.

Results: The results of the study revealed three overarching themes, 13 organizing themes, and 71 basic themes that impact public participation in urban environmental protection. The components identified in the study included "influential factors", such as social trust, sense of social belonging, social responsibility, personality traits, context and the possibility of participation, motivation to participate, knowledge, and awareness. The study also identified "constraints", including sociocultural, structural-legal, economic, and executive constraints. Additionally, the study found that public participation in environmental protection was a key category that emerged from the findings.

Conclusion: Based on our findings, the identified themes can be incorporated into the development and assessment of collaborative programs and activities aimed at promoting sustainable development in the field of urban environment.

1. Introduction

Public participation is now widely considered a fundamental strategy for promoting social development. This strategy enables citizens to influence various development phenomena and variables based on their competence and ability [1]. Participation can be defined as "exchange forums organized to facilitate communication between government, citizens, stakeholders, interest groups, and businesses on a particular decision or concern", ensuring that the decision-making process and outcomes are "democratic, open, legitimate, technically competent, and timely" [2]. Moreover, the participation of citizens and community-oriented organizations can be referred to as

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public participation, which is closely related to social responsibility. Individuals exhibit a special concern for their community and are responsible not only for their own lives but also for their community [3, 4]. Participation offers various benefits, including promoting justice, empowering citizens, and leveraging local information and knowledge [5]. At its best, participation can expose decision-makers to people's daily experiences and local preferences for an area, leading to better-informed decisions. Additionally, participation enables communities to provide their unique perspectives, observations, opinions, and suggestions for the future [6, 7]. With the expansion of the meaning of participation and its integration into all areas of life, contemporary societies are now moving towards a situation where individuals have a conscious and real involvement in determining their destiny. Indeed, it appears that "modern" societies have undergone a participatory revolution [8, 9]. Effective environmental governance requires the participation of all stakeholders, including governments, non-governmental organizations, the private sector, social groups, and citizens, in collaborative efforts to achieve environmentally sustainable development. This form of governance represents an alternative to traditional top-down policymaking and regulation by the government [10]. The experience of developed countries also indicates that the main driving force behind environmental governance is the people themselves [11]. The advantages of participation in environmental policymaking are generally divided into three categories: substantive benefits (such as improving understanding of issues and achieving better solutions), normative benefits (such as enhancing individual and public participation by encouraging learning), and instrumental benefits (such as clarifying collaborative relationships for program implementation and promoting transparency and social trust) [12]. Given the unfavorable state of the environment, the progress of technology, and the growing public awareness in the field of environmental protection, the general public is seeking ways to express their opinions and demands through various means and tools in order to protect their environmental rights and interests [13, 14]. Public participation serves as a platform to achieve this. Public participation is subject to different variables that are essential for social policymakers to identify and acknowledge, as these factors determine the hierarchy of relevance from the perspective of social agents involved in the participation process [15]. Chen *et al* (2023) investigated motivational mechanisms and strategies to promote public participation in environmental protection behaviors. Their findings suggest that public awareness, social factors, and cognitive preferences are key factors that influence public participation in environmental protection [16]. Zhang *et al.* (2023) examined the relationship between public participation in environmental governance and environmental violations committed by companies. They concluded that public participation in environmental governance can enhance the number of local environmental regulations, thereby reducing environmental violations by companies [17]. Leng *et al.* (2022) investigated citizen participation in reducing urban air pollution in Sichuan, China. They found that citizen participation, along with media monitoring had significant effects in reducing air pollution [18]. Mketo *et al.* (2022) examined the effects of strengthening community participation on improving environmental health in rural Tanzania′s Bukombe district. They concluded that public participation had become a dominant approach in environmental health projects; however, its improvement remained challenging [19]. Zhang *et al.* (2021) investigated the impact of public participation on air pollution control using provincial-level data from China. The results showed that both direct and indirect public participation had a significant positive effect on the control of industrial air pollution by strengthening the supervision of environmental law enforcement. In addition, indirect public participation was found to influence the formulation of environmental policies [20]. Nouri *et al.* (2022) conducted a study to investigate the role of social and cultural indicators affecting citizens' participation in preserving the urban environment. They concluded that there was a positive and significant correlation between social factors, including knowledge, commitment, and generalized trust, and citizens' participation in protecting the urban environment. Additionally, cultural factors and their components were also found to have a positive and significant correlation with citizens' participation in preserving the urban environment [21]. Gholizade *et al.* (2022) investigated the relationship between virtual social networks and the desire to participate in environmental protection activities among citizens aged 15 years and above in Tehran. They concluded that participation in environmental activities was influenced by users' trust and informed performance in environmental-oriented cyberspace [22]. Mahmoudi (2021) investigated the necessity of public participation in the urban management structure and highlighted education as the foundation for cultural and social development. The results revealed that educating individuals on the methods and ways of participation can improve the outcomes of public participation in urban management [23]. Rahimi Bogar and Zare (2018) assessed citizen participation in environmental and urban health based on socioeconomic determinants of health. Their results showed that socio-economic determinants. Their study found that various socio-economic determinants, including access to information, access to quality educational and health services, education level, economic status, immigration, residence, gender, and employment status, had a significant and strong odds ratio and predictive value in citizens' participation in maintaining environmental health and urban health [24]. Correspondingly, considering the importance of participation in environmental protection in order to improve the health of society and achieve sustainable development, it is vital to gain a comprehensive understanding of the phenomenon of participation, its influential factors, and constraints. Therefore, the current research aimed to identify the key categories, influential factors, and constraints of public participation in the field of

environment. One of the research objectives was to employ expert interviews and thematic analysis to "extract the hidden factors that form the structure and affect public participation in the field of the environment".

2. Materials and Methods

The research method adopted in this study is qualitative both in terms of the fundamental objective and the method of collecting qualitative data. Thematic analysis was utilized, which focuses on identifying, analyzing, and interpreting patterns of meaning in qualitative data. The community of participants consisted of key experts related to the research topic, and a purposive sampling method was used to ensure maximum diversity in primary data. The sampling method applied was heterogeneous, and was used) and theoretical saturation was achieved through 17 interviews. The inclusion criteria were an education degree, experience of collaborative activities, and work experience related to the research topic. After reviewing the literature and becoming familiar with the problem, in-depth semi-structured interviews with experts were conducted to collect research dat. Thematic analysis was used to identify the basic research categories, and MaxQDA version 20 software was used to manage the analysis process. Researchers in social and human sciences, sociology, biology, and other fields often use thematic analysis to identify qualitative and verbal patterns and prepare codes related to them [25]. The opportunities arise from thematic analysis, such as identifying the existing knowledge gap in the field of study, focusing on the research topic, gaining a better understanding of the research phenomenon, properly analyzing new data, and achieving the main goals of the research, etc. Its numerous benefits, including the possibility of introducing unpredictable ideas, the possibility of social or psychological interpretation of data, and its suitability for policy formulation, make it a useful method for qualitative analysis, and hence the reason for its adoption in this research [25].

3. Results and Discussion

The qualitative part consisted of 17 experts related to the field of research, consisting of university professors experienced in environment, sociology, communication, and psychology, as well as members of non-governmental organizations, environmental activists, and managers and executive experts in the specialized field of research. The key research experts comprised 8 women and 9 men, with 5 holding a master's degree and 12 holding a Ph.D. Further, 6 experts had 5-10 years of work experience, while 11 had more than 10 years of work experience. Therefore, adverbs related to expertise were considered. The interview framework included four open-ended questions (Table 1) with the expectation that new and exploratory questions would be raised during the interview process if necessary.

Table 1. Interview questions for thematic analysis

Question	Description
1	What is the importance of public participation in the field of the environment?
2	What are the influential factors on public participation in the field of environment?
3	What are the constraints of public participation in the field of the environment?
4	With what indicators is public participation in the field of environment formed?

3.1 Qualitative thematic analysis

3.1.1 The steps of qualitative thematic analysis

The six steps of qualitative thematic analysis shown in Figure (1) are explained below.

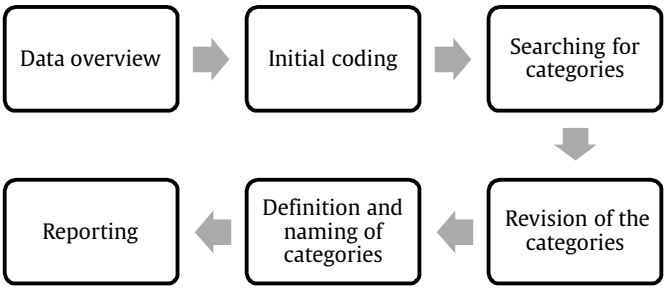

Figure 1. The process of qualitative thematic analysis

3.1.2 First step: Data overview

After each interview, the text was entered into the software and analyzed. This step involved actively reading and searching for patterns and meanings in the data, ensuring greater familiarity with the data.

3.1.3 Second step: Initial coding

In this step, the codes introduced the data feature. The coded data had different analytical units.

3.1.4 Third step: Searching for categories

At this stage, different codes were categorized into potential categories, and all coded data summaries were sorted into specified categories. The analysis of codes began at this stage with consideration given to how different codes could be integrated to create a general category. Indicators extracted from the interview texts were categorized through screening, removing duplicate codes, and integrating synonymous codes.

3.1.5 Fourth step: Revision of the categories

This step involves two parts: (a) reviewing themes at the level of coded summaries and (b) refining or validating themes in relation to the dataset. After the initial categorization, the indicators extracted from the interview texts were re-screened, and additional indicators or those

without lexical value were removed in line with the research objectives.

3.1.6 Fifth step: Definition and naming of categories

This stage begins when a satisfactory map of categories has been created. The themes presented for analysis were defined and revised, and the resulting data were analyzed. By defining and reviewing, the nature of what a category discussed was determined by which aspects of the data each category contained. In addition, key themes and sub-themes were named, and a specific theme was assigned to each category of codes extracted from the interview texts. This research used thematic analysis based on the method proposed by Attride-Stirling (2001), which includes overarching themes, organizing themes, and basic themes [26]. The reviewed items are as follows:

3.1.6.1 Influential factors

3.1.6.1.1 Conditions governing society

The basic themes of the Conditions governing society include the following: Social interactions; Social justice and equality; The economic status of society; The environment and political atmosphere of the society; The environmental and health conditions of the society; Cultural issues, values, and norms; Expansion and level of access to information and communication technologies.

3.1.6.1.2 Social Trust

The basic themes of the Social Trust include the following: Good faith towards people in society; Trust in family members, friends, and acquaintances; Trust in the functioning of urban management institutions and bodies, especially environmental; The existence of a network of trust between people of the same group or between social groups.

3.1.6.1.3 Sense of social belonging

The basic themes of the Sense of social belonging include the following: The feeling of friendship and belonging to people; Belief in having an impact on health and environment (city and neighborhood); Assessment and understanding of living conditions; Identification and shared emotional ties to the city.

3.1.6.1.4 Social responsibility

The basic themes of Social responsibility include the following: Sense of responsibility and duty of citizenship (regarding environmental health and condition); Encouragement and support; Degree of adherence and commitment; Paying attention to the behavior of others in protecting the environment and community health.

3.1.6.1.5 Personality traits

The basic themes of the Personality traits include the following: Self-esteem; Beliefs; Looking at the meaning and concept of life-based on age changes; Openness and acceptance of new experiences; Self-awareness; Compatibility or agreeableness; Extraversion; Conscientiousness.

3.1.6.1.6 Context and possibility of participation

The basic themes of the Context and possibility of participation include the following: The institutional legal status of participation; Resources, specialized and infrastructural facilities of participation for effective interaction and communication; Effective (formal and informal) education about the environment; The approach and performance of policymakers and urban managers toward environmental participation; The existence of community-oriented environmental organizations and support for their activities.

3.1.6.1.7 Motivation to participate

The basic themes of motivation to participate include the following: Social motivation and gaining social prestige; Belief in participation and its benefits; Conceptualization, evaluation, and outcomes of participation; Experiences and records of the individual in the field of environmental protection; Concern about the environment; Reward and profit motivation.

3.1.6.1.8 Knowledge and awareness

The basic themes of knowledge and awareness include the following: The collection of thoughts, opinions, and sensitivity toward the state of the environment; Familiarization with environmental protection strategies and the concept of sustainable development; Knowledge about green, sustainable, and environmentally friendly lifestyles; Getting to know the infrastructure and the possibilities of participation in the environment.

3.1.6.2 Constraints

3.1.6.2.1 Socio-cultural constraints

The basic themes of socio-cultural constraints include the following: Fear of the consequences of participation; The feeling of powerlessness and ineffectiveness towards the environment; Inadequate standards in the community (to start collaborative activities); Indifference and lack of prioritizing environmental issues; Citizens are not aware of their rights and duties towards the environment; Traditionalism and resistance to changing old ways and patterns of life and not accepting new approaches; The spirit of self-interest and the preference for personal interests over social interests; Decreased social capital due to fragile trust.

3.1.6.2.2 Structural-legal constraints

The basic themes of structural-legal constraints include the following: Absence of synergy and lack of attitude and belief towards participation; Compilation of policies and collaborative planning in a top-down manner; Incompatibility of structures with collaborative processes

and insufficient collaborative opportunities; The complexity of systems and operational methods and administrative bureaucracies; Lack of transparency and gaps in the laws and guidelines approved with existing facts.

3.1.6.2.3 Economic constraints

The basic themes of economic constraints include the following: High participation costs and lack of financial resources, and consequently time constraints; Income fluctuations and economic pressures; Failure to improve the situation and achieve economic benefits in the event of collaborative behaviors.

3.1.6.2.4 Executive constraints

The basic themes of the executive constraints include the following: Lack of necessary skills and abilities to establish constructive interactions and communications with society; Inadequacy of regulatory mechanisms and inappropriate notification methods; Non-expert and artificial views on cooperative activities; Lawlessness and violations at various levels of society; Failure to maintain active volunteers and interested parties and their technical support.

3.1.6.3 Key category

3.1.6.3.1 Public participation in environmental protection

The organizing themes of public participation in environmental protection include the following basic themes: Interest in participating in public environmental meetings and gatherings; Interest and willingness to work in environmental group work; Necessary knowledge regarding the concept of participation and the feeling of being able to manifest cooperative behaviors in different dimensions; Desires, inclinations and interest in influencing the state of the environment; Cooperation and membership in environment-oriented community groups; Monitoring and follow-up of environment-related issues; Carrying out and participating in environmental activities; Involvement in decision-making and decision-outlining in the field of environmental issues.

3.1.7 Sixth step: Reporting

Through examining and categorizing the descriptive codes from the interview texts, a total of 71 sub-themes (initial themes) were identified. These themes were subsequently categorized into 13 main themes (constructive themes) based on their similarity and semantic affinity. The main themes include conditions governing society, social trust, sense of social belonging, social responsibility, personality traits, context and possibility of participation, motivation to participate, knowledge and awareness, socio-cultural constraints, structural-legal constraints, economic constraints, executive constraints, and public participation in environmental protection.

3.2 Quality assessment of results

Guba and Lincoln's criteria of 'trustworthiness' [27] were used to evaluate the quality of the results. To clarify and resolve any ambiguities, three experts who participated in the interviews were given specific titles. The reliability was determined using Holsti's coefficient and review techniques by colleagues and researchers themselves. The recorded conversations were given to several experts in this field for review and revision after data analysis. The texts of the conducted interviews were coded in two stages, and subsequently, the Percentage of Agreement Observation (PAO) was calculated using equation (1):

$$PAO = \frac{2M}{N1+N2} = \frac{2*236}{298+365} = 0.712 \qquad \text{Eq. (1)}$$

The PAO value in this study was calculated to be 0.712, which is greater than 0.6, indicating favorable reliability.

3.3 Highlights

The level of independence, freedom, knowledge, and other factors in society can influence the emergence of cooperative behaviors. Based on the results of our research, it is possible to analyze and interpret the indicators and components that affect participation in urban environmental protection in the following manner:

3.3.1 Conditions governing society

The social learning theory emphasizes the role of social environmental factors in shaping attitudes and behaviors. This theory highlights the interdependent relationship between people, behavior, and the environment through mutual causality. Although the learning process occurs in both physical and social environments, with the former being related to the (material aspects of the behavior domain, and the latter being related to the real or imagined presence of individuals during learning, it appears that the social environment holds particular importance [28].

3.3.2 Social Trust

There are several reasons why trust strengthens public participation in environmental governance, including (a) "trust" facilitates information exchange among social members and reduces environmental costs; (b) "trust" between actors reinforces other elements of social capital; (c) loss aversion can lead to environmentally harmful consumption decisions and actions, while "trust" helps reduce the negative effects of "loss". As a strategy to reduce cognitive complexity in risky decisions, people use trust [29].

3.3.3 Sense of social belonging

The sense of belonging is defined as the experience of personal involvement in a system or environment, such that individuals perceive themselves to be an integral part of that system or environment [30]. Ibn Khaldun, a renowned scholar, considers one of the most desirable characteristics of a city to be attentive toward public participation and social

relationships among people in their place of residence and other citizens. He mentions that a developing and sustainable city is the result of the collective efforts and cooperation of individuals, including the ruling class [31].

3.3.4 Social responsibility

Today, the most basic duty of humans is to take responsibility for both natural and man-made resources. Responsible environmental behaviors comprise a set of actions taken by individuals in society towards the environment, reflecting a distinct approach to the environment driven by a range of emotions, desires, and special preparations [32]. According to Martos-Pedrero *et al.* (2019), responsibility is one of the most effective parameters in public participation [33].

3.3.5 Personality traits

From a functional-structural perspective, changes must be made to the personality traits of community members to accelerate their involvement in the process of participatory orientations. Theorists believe that conscious and voluntary public participation cannot be achieved without the development of social personality [34]. Personality differences are believed to be a key variable in participation [35].

3.3.6 Context and possibility of participation

The context of participation refers to a set of specific conditions under which action and reaction strategies are formed. Motivated action theory views participation as a combination of motivation and the possibility of participation [36].

3.3.7 Motivation to participate

Conscious participation becomes possible when the community is motivated to play a role in activities related to environmental protection. Given the increasing number of environmental challenges and crises and their impact on health issues, society must take action in this field. Citizens' pro-environmental behaviors can reflect altruistic motivation [37]. It is essential to motivate and encourage individuals to prioritize collective and group benefits over personal interests and engage in environmental and green behaviors. The development of such behaviors is important for addressing, as well as for securing our common destiny and the well-being of future generations [38, 39].

3.3.8 Knowledge and awareness

Environmental knowledge and awareness encompasses an understanding of environmental problems, their consequences, and potential solutions. The three dimensions of environmental knowledge include systemic knowledge, action-related knowledge, and affective knowledge. Systemic knowledge pertains to natural processes within ecosystems and the impact of human-nature interactions, including their problems and consequences. Action-related knowledge refers to available behavioral options suitable for solving environmental problems. Affective knowledge is related to the specific effect and effectiveness of a particular action or option compared to other alternatives [40].

3.3.9 Socio-cultural constraints

Public dissatisfaction with the state of the environment, its indicators, and the emergence of numerous environmental and health problems such as water, soil, air, and sound pollution along with excessive consumption of energy resources and mass production of waste, can lead to feelings of powerlessness, indifference, and a lack of knowledge about the social rights, duties, and responsibilities of individuals towards the environment, which limits their participation in protecting the environment.

3.3.10 Structural-legal constraints

The lack of synergy and cooperative attitude across different fields in addressing and managing environmental challenges and issues limits social cooperation, ultimately weakening the effectiveness of environmental protection activities. If administrative and bureaucratic control is implemented through a top-down pressure transmission mechanism, this can easily lead to the failure of environmental regulations and programs due to the lack of public participation [41, 42].

3.3.11 Economic constraints

The high costs and expenses associated with participation are considered a challenge in carrying out meaningful and informed participation. If people lack the necessary financial resources and access to implement their environmental projects, participation may quickly give way to indifference and despair, significantly limiting the process of sustainable development.

3.3.12 Executive constraints

Insufficient knowledge, skills, and lack of belief in the results of participatory activities among planners, as well as inadequate mechanisms, can limit participatory activities and act as obstacles to the use of this valuable capacity in society, particularly in environmental issues that require continuous innovation and initiative.

3.3.13 Public participation in environmental protection

Environmental participation, together with social innovation, can serve as an innovative solution and make the path to sustainable development more feasible. Public participation has two dimensions: the mental dimension that deals with feelings and desires, and the objective dimension which deals with the behavioral aspects of participation. Both of these dimensions have been identified and investigated in the research analysis to achieve the power of citizenship in the field of environmental protection through proper understanding and attention to each of them. It can be argued that effective planning can only be achieved

by moving beyond limited participation and achieving real participation.

4. Conclusion

The research was conducted using thematic analysis to identify the components and indicators that influence public participation in urban environmental protection. Based on the results of the research, 13 organizing themes and 71 basic themes were identified, which were analyzed and interpreted in the results and discussion section. In summary, real participation in environmental protection can be achieved by fostering a serious sense of responsibility among members of society, which can be promoted through increasing knowledge and awareness, motivating and providing opportunities for participation, and developing a sense of belonging to their city. Communication skills are essential to achieve successful grassroots and informed participation. Correct attitudes and behaviors, along with knowledge, experience, and expertise, are always necessary for success in this category and are effective in creating the necessary trust and credibility to achieve meaningful participation. According to the research results, citizens should be involved in goal setting, planning, implementation, and decision-making, with their opinions and interests being the focus of environmental affairs in the city. In this participation model, community members participate in polling and are given the right to monitor their demands. The flow of information in the process of effective participation is two-way and highly active, promoting intellectual, social, cultural, and personal growth among people [43, 44]. It seems that effective culture and discourse building should be done to develop society's culture and vision in connection with the concept of decent governance as a collaborative process in the path of sustainable development, as decent governance requires justice, participation, and responsibility. In this case, citizens and social groups are also aware of their rights and duties, and they are placed at the center of planning [45]. The indicators and results of this research can be used to model public environmental participation. Future-looking and forward-thinking approaches are necessary concerning environmental issues and the role and position of citizens in this area. In this regard, green ideas and initiatives of community-based groups and environmental and natural resources NGOs should be used, and they should be given comprehensive (technical, specialized, expert, legal, etc.) support. In addition, conditions for the development of knowledge enterprises and startups should be provided, which can, directly and indirectly, help to achieve this goal, including providing technologies, green technologies, and innovative and sustainable solutions for environmental protection, expanding green and smart products, promoting efficiency and using local resources, and introducing educational and informational methods and tools with environmental protection content to make access to awareness and knowledge easier for everyone. These measures can lead to an increase in citizens' participation and the desire for green behaviors. It is necessary to highlight that these measures must be introduced using the latest information and communication technologies and defining and presenting green campaigns at the community level, which should be in line with personality traits such as self-awareness, self-esteem, and the spirit of collective work. All the mentioned actions must have the social support of non-governmental organizations and associations to gain acceptance and become sustainable green thinking.

4.1 limitations of the study

The Covid-19 pandemic has caused social distancing and disrupted social integration in society, and it has also created challenges in conducting research due to the busyness of experts and the difficulty of coordinating interview sessions to collect research data.

Authors' Contributions

Zahra Tehraei Nasrabadi: Preparation of the introduction sections; Data collection and analysis; The completion of the discussion section of the article. Saeed Motahari: Writing the research method of the article. Maryam Farahani: Data analysis. Bita Azadbakht: Data analysis; Research conclusions.

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Conflicts of Interest

The Authors declare that there is no conflict of interest.

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Ethical considerations

All the data, media and notes of the interviews were marked with a numerical code instead of the names of the participants. Furthermore, audio recordings were deleted upon completion of the analysis and full writing of the article. The documents were reviewed and analyzed truthfully and reliably, adhering to ethical standards. In addition, informed consent was obtained while preserving the confidentiality of the individuals involved. (No: 11348060237439100001623837 43).

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