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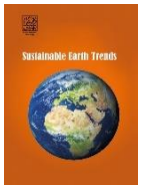

Women: A turning point of urban resilience in the Post-COVID-19 era (Case study, Tehran, Iran)

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ABSTRACT

The study's objective was to identify and analyze changes in resilience indicators and their four dimensions. This study aims to investigate the capacities of women in Tehran in the context of urban resilience in the post-COVID-19 era, which has witnessed multiple surges of COVID-19 cases. The Delphi technique was employed in this study to determine appropriate indicators for decision-making. The questionnaire focused on women's roles in the city's safety, their control over the situation during or before the crisis, and their knowledge of the environment and risk factors. The efficiency of the questionnaires was 100% due to the researchers' knowledge of the target group's conditions in the first stage of the Delphi technique. The participants for the study were selected based on their familiarity with the safety conditions in District 14 of Tehran Municipality. The results revealed that women in the post-COVID-19 period are expected to exhibit a higher level of physical resilience at 81.21% and social resilience at 70.15%. The results introduce women as potential/active managers in the post-COVID-19 era. The findings may help urban planners to consider such conditions in their planning charts. What distinguishes this study from other studies is its focus on the target group, and position of women for urban planning; it will be possible to increase resilience with the help of women.

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1. Introduction

With the onset of the COVID-19 crisis, humans faced numerous challenges, such as a lack of proper understanding of social distancing and risk, maximum presence in closed spaces, and inadequate urban infrastructure to combat an unknown virus. The COVID-19 crisis identifies valuable lessons for sustainable urban planning and development (Samadi Foroushani, 2024). For instance, anthropogenic activities were significantly reduced during the COVID-19 pandemic, allowing for the opportunity for source reduction of air pollutants (Islam et al., 2023). Urban management is not a one-size-fits-all approach.

Every city has unique demographic and environmental conditions, and it is essential to clearly understand the planning problems in each region during crises and post-crisis situations to normalize urban conditions (Amin and Adah, 2022). A city's resilience is determined by how quickly it recovers after a crisis. The higher the resilience, the lower the vulnerability.
However, it is crucial to identify the target group that should be made resilient. This group must represent a significant portion of the population and safeguard citizens' financial and social capital during critical times to minimize risks.

Focusing on this indicator in urban development requires theoretical studies and knowledge of the target group for education and cooperation that can be utilized in the future (Khazaei and Razavian 2018; Azizi, et al., 2020). Additionally, no special action has been taken according to the citizens' conditions, which further emphasizes the need to pay attention to the importance of resilience in this city by emphasizing integrated management (Buyukozkan et al., 2022). There are two ways to manage post-Covid-19: experiencing Covid-19 management and predicting future Covid-19-like epidemic conditions. Therefore, there is a need for preparedness which varies according to the conditions of different countries. Safety and resilience are closely related, and the four indicators of resilience (economic, social, physical, and institutional) are effective in achieving a secure society (Razayian et al., 2018). In general, crises that threaten urban security include natural, human, social, economic, political, cultural, spatial, and military factors (Elterabily, 2020). It is essential to identify the causes of accidents, safeguard the environment, and enhance the overall resilience of communities to minimize damage (Jazayeri et al., 2019). Due to the restrictions and difficulties presented by urban social and economic issues, it is crucial to assess and tackle the problem of adaptability in urban research to prevent urban destruction. This study introduces a unique perspective on urban resilience by emphasizing the role of women in post-COVID-19 urban planning and development. While some research (Balamurali et al., 2023; Zumratbekovna, 2022) exists on the role of women in different aspects of society, the specific focus on their role in enhancing urban resilience in the aftermath of a pandemic is relatively unexplored in the existing international literature. In addition, the study contributes to the expanding realm of gender-responsive urban planning and management. By regarding women as a focal group for urban resilience planning, the research enhances comprehension of how gender inclusivity can result in more potent post-crisis recovery strategies within urban settings. Furthermore, the study utilizes a systematic approach by assessing urban resilience through four indicators: economic, social, physical, and institutional. While resilience case studies such as Cinner and Barnesoften (2019), Imperiale and Vanclay (2021), Zeng et al. (2022) and Eldesoky et al. (2022) focus on individual dimensions, this comprehensive approach to measuring resilience in the context of a post-pandemic urban environment is a unique contribution to the global literature. This study contextualizes the concept of resilience within the specific urban conditions of Tehran. This study underscores the necessity for customized and context-specific approaches to urban resilience planning by the study of a densely populated and diverse city such as Tehran. These findings can offer a valuable point of reference for other metropolises grappling with comparable challenges. The literature review serves as a basis for recognizing gaps between the research and suggesting new directions for investigation. In this instance, the reviewed studies shed light on various aspects of COVID-19 and its influence on urban planning and design. However, these studies also uncovered areas where further research is required to comprehend the pandemic's consequences on urban environments. For instance, Sharifi and Khavarian-Garmsir (2020) emphasized the significance of environmental indicators, like urban design and transportation, in managing the COVID-19 crisis. They did not provide detailed insights into the specific design elements that would be effective in achieving the goal of improving post-COVID-19 urban planning. Elterabily and Elgheznawy (2020) suggested that enhancing people's social behavior is crucial for post-pandemic urban planning. Salama (2020) found that COVID-19 has triggered a global crisis that goes beyond being just a disease. The turning point of this change is in the structure of human communication, which is now interpreted as a new normal. The changing patterns in urban spaces necessitate new needs, and standards must be defined to cater to them. According to Pisano (2020), the COVID-19 pandemic has highlighted the need for urban planners to assess the preparedness of their cities for such crises. Therefore, cities should develop plans that take into account their vulnerable areas. In the post-COVID-19 era, it is essential to prioritize pathology when designing future programs. This means focusing on quality, justice, flexibility, and accepting distance as strategic elements of the city. By doing so, urban planners can ensure that their cities are better equipped to handle similar crises in the future. In the post-COVID-19 era, pathology is important for the upcoming program. In this

context, attention to quality, justice, flexibility, and acceptance of distance as strategic elements of the city are principal. Fereira (2020) believes that what distinguishes COVID-19 from other existing epidemics is the effect of the virus on behavioral factors that should be noted on a social resilience scale. Tokazhanov (2020) refers to the condition of residential buildings during the COVID-19 era and the change of internal physical elements such as elevator conditions to create social distance. According to Suleimany et al. (2022), demographic resilience includes physical health, psychological well-being, life quality, and hygiene. However, Kakderi et al. (2021) proposed that strategies, while predominantly temporary, align with the principles of smart growth and sustainable development, embodying a transformative approach. However, most of the policy responses implemented in the initial months of the pandemic neglected to capitalize on the progress achieved in the realm of smart cities and to embrace readily available solutions such as monitoring, alerting, and operations management. The level of urban smartness plays a crucial role in explaining urban resilience. Resilience is correlated with all aspects of smart cities, and this correlation is particularly pronounced in the current (post-) pandemic scenarios. As a result, resilience strategies are being redefined in the context of smart cities (Apostu et al., 2022). According to the Institute for Social and Regional Resilience in the European Union (2017), resilience is the ability to predict risks, limit their effects, and quickly return to survival, adaptability, and growth in the face of previous turbulent changes. Resilience is a trait that varies from person to person and can grow or shrink over time. While Gharai (et al. 2018) mentioned the four aspects of resilience are dominance, transition, achievement, and retrieval, Preety and Bhandari, (2020) introduced four dimensions for urban resiliency (Table 1). A resilient society views a risky situation as an opportunity rather than a threat. This mindset allows them to experience success in the face of adversity rather than anxiety. Resilience enables individuals and communities to adapt well to problems, which is more than just avoiding negative consequences (Sharifi and Khavarian-Garmsir, 2020). Resilient individuals possess a mindset that enables them to recover and grow from stressful situations instead of being negatively impacted like many others (Clos, 2017). Resilient societies are characterized by abundance and coordination of components, diversity, efficiency, internal independence, power, dependence, adaptability, and cooperation or collaboration (Frantzeskaki, 2016). To achieve this objective, it is important to explore the various dimensions of resilience in a city like Tehran, with focus on the role of individuals, especially women, in managing critical situations. This will help determine their position in the resilience framework and allow for targeted training and development. Therefore, the post-COVID-19 era presents an opportune moment to emphasize the role of women in post-corona resilience, given their strong grasp of sociological dimensions. The COVID-19 pandemic has significantly impacted our social and political life. Therefore, we need to focus on building resilience in the post-epidemic period. If we acknowledge COVID-19 as a crisis, we can plan for it by prioritizing resilience and the role of women, as recommended (African Union Commission, 2021). Resilience is crucial during crises like COVID-19, and we should identify the target group to achieve resilience successfully. Despite the rapid growth of urban areas, social progress requires a mechanism for achieving optimal resilience and development. Resilience is a new concept in urban design and planning that aims to make cities less vulnerable to accidents and increase safety and tolerance for people (Mishra et al., 2020; Sitko, 2019). This concept involves the rehabilitation of local communities to address environmental issues and comply with their constraints (Fanni, 2014 and 2020). Success in resilience depends on involving the highest percentage of local people in controlling safety and disaster preparedness. Therefore, resilience can be seen as a turning point in increasing people's awareness of both natural and human safety levels (Bizzotto, 2018). The aim of resilience is not to eliminate the damage caused by accidents but rather to focus on the resilience of individuals and promote social resilience (ICIE, 2019). Determining the quality of urban resilience can be achieved by emphasizing indicators such as reflection, strength, diversity, universality, capacity, and mixing. A resilient city has stable physical systems and a strong social network, including infrastructures like roads, buildings, and natural systems. It's built to withstand and recover from disasters based on past

experiences (Galderisi et al., 2020). The successful relationship between vulnerability and resilience is dependent on well-defined resilience dimensions in each region (Proag, 2014). To ensure urban resilience, communities need to establish sustainable funding for urban safety. This is because resilience is an ongoing process that incurs costs, which cannot be ignored by the government's budget (Rega, 2020). Successful countries have identified insurance and the private sector as two important sources of resilience. To be effective, attention must be paid to risks, laws, and up-to-date information. Think tanks and meetings with experts can help control financial resources and identify new ones for resilience development. (ICIE, 2019). Urban planners consider safety in short-term, medium-term, and long-term plans to protect lives and property (Begin, 2019). Women should be considered as an indicator for identifying risk and resilience (Hartog, 2017). According to Segger (2020), one of the principles of sustainable development is public participation, according to which people should be able to participate in decision-making, and women should have an equal share in this decision-making. This is considered by women and they are an integral part of sustainable urban development with an emphasis on resilience (Chowdhury et al., 2020). The type of resilience that women in Tehran are active and most successful in, is an issue that was examined in this study. Tehran's special conditions in the field of safety show that needs to know the resilience target group more than ever (Safaeipour and Zarei, 2017). In this regard, one of the ways to increase the resilience of Tehran is to identify the factors that make the city vulnerable. Density of building and land use reform are among the issues identified by women in developed societies and successful countries in this field. It indicates an increase in women's participation in identifying this sector and in increasing the level of resilience (Preety and Bhandari, 2020). This shows that they should not be left out by planning part of the safety policy. Rather, they should be given priority because women can identify risk factors and better manage situations in crises, especially natural crises. Women are key to families. Many safe countries focus on family education to promote safety (Aghamiri, 2020). Another fundamental analysis in this regard is the neglect of the women’s development force in improving the quality of life and the body of urban settlements. Empowerment is strengthened in the light of women's socio-economic poverty alleviation (Fanni, 2020). Although many cities in Iran lack proper urban planning for women, it is crucial to increase stability and improve the security of public spaces, especially smart infrastructure, to encourage women's active presence. This approach has proven successful in other countries, where improved safety has resulted in increased women's empowerment. For instance, India has a systematic view of resilience that prioritizes people's needs, making them the focal point of their resilience strategy. Climate change, urbanization in rural areas, economic downturn, and declining living standards have prompted India's officials to pay special attention to resilience and fund initiatives accordingly (Bizzotto et al., 2019). In India, women work alongside men in various fields. Therefore, the government trains women in vulnerable states through the United Nations International Children's Emergency Fund (UNICEF) to safeguard their families' financial resources during times of crisis. By prioritizing women's safety, it can be said that India emphasizes social resilience. (Shaykh al-Islami et al., 2017). After the Punjab floods in 2008, Pakistan began to focus on resilience. The country took measures to reduce the risk of floods and droughts in rural areas by strengthening infrastructure and communities. The National Assembly approved a resilient plan which helped to significantly reduce damage caused by natural disasters (Harburg, 2020). Bangladesh trained people to protect natural resources like coastal forests, which helped manage crises and increased women's safety. Initially teaching social resilience indicators, the program improved physical resilience too (Barakat, 2017). The theoretical discussion in this research was based on Carter's theory (Safaeipour and Zarei, 2017) as it provides a set of indicators for measuring the conditions that affect disasters. While many studies have examined the impact of COVID-19 on various aspects of urban life, this study seeks to provide a comprehensive analysis of the environmental, social, and economic factors that can improve urban life in the post-COVID-19 era. Furthermore, this study aims to contribute to the existing literature by proposing a framework for managing the COVID-19 crisis in urban areas. By focusing on these indicators

and using them as a basis for the proposed framework, this study will offer a unique and valuable perspective on how to improve urban life in the post-COVID-19 era. A comparison of Tehran's conditions before and after the COVID-19 outbreak shows that traffic, air pollution, and worn-out infrastructure were the three main problems before the epidemic (Naudé and Nagler, 2022). However, after the outbreak, crowded centers such as public transportation systems and offices became one of the main indicators of the virus's prevalence in urban society, as they required human communication and presence in closed spaces. Most jobs in Tehran were not designed considering the conditions of COVID-19 (Badie, 2019; Abu Ghabish, 2020). Tehran has 22 districts, and each district is divided into three to five sub-districts, but there is no target group to control urban safety (Azizi et al., 2020). This highlights the need to pay attention to the importance of resilience in this metropolis. One of Tehran's problems in controlling environmental and safety conditions is multi-management and the lack of management of operational organizations in this field. Multi-management has led to past incidents such as the Tehran Plasco building accident. The study's proposed framework for managing the COVID-19 crisis based on the identified indicators will contribute to the existing literature on the topic and potentially provide valuable insights for policymakers, urban planners, and researchers in the field. However, this research focuses on resilience and is based on identifying a target group that can be invested in the future given the negative impact of Covid-19. In this study, the role of women in post-COVID-19 and the four dimensions of resilience were assessed to evaluate urban resilience. Coronavirus will affect urban life in the future; thus, women are proposed as the target group for this study to provide a proposed plan for post-Covid-19. Women have received less attention in previous research. The study aims to investigate the role of women in ensuring the safety of Tehran, focusing on all-round resilience. The research covers a scale that ranges from the family to the neighborhood level. The next stages of the study involved the analysis of extractive indicators from this group and their classification based on the dimensions of urban resilience. The two selected resilience dimensions were chosen due to their high percentage of the mean and the opinion of the sample group. Finally, the study explores the necessary solutions proposed by women to ensure the safety of city, emphasizing the conditions before natural and human hazards.

2. Material and Methods

2.1. Study area

The focus of this study is the city of Tehran, which is the capital of Iran. Considering the city's vast size, District 14 was chosen using a systematic random method from the 22 districts in Tehran (Fig. 1) this district is situated in the southeast of Tehran and is an old neighborhood with a worn-out texture. The district comprises 21 neighborhoods and the population is approximately 500,000, which includes 154 households and around 240,211 women (Iranian Census Organization, 2016). For this study, a group of 100 women were selected through systematic random sampling.

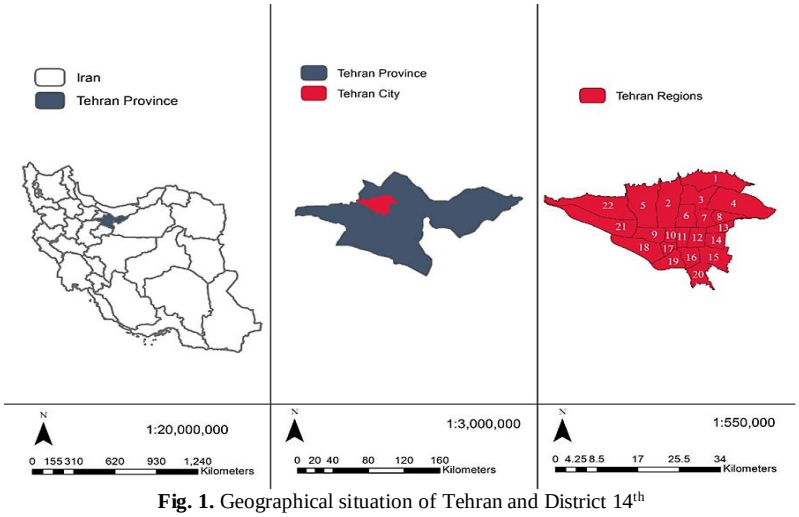

Fig. 1. Geographical situation of Tehran and District 14th

The Delphi is a well-established research technique used to generate consensus among experts on a particular topic. It (Table 1) was used to gather opinions from experts in e-learning regarding the most important features of a successful e-learning platform. The experts were chosen based on their qualifications and experience in the field. The Delphi method was applied through questionnaires sent to the experts. The results were analyzed and synthesized to identify the most important features and the validity and reliability of the results were ensured by applying statistical tests to the data. This method provides a scientific basis for the results, as it is a rigorous and well-established research method that has been used successfully in many previous studies. However, every expert in the field and even citizen has their own opinions on the matter. To gather these opinions, the Delphi technique was used with open-ended questions. Views of women in Tehran were collected to control the current situation of COVID-19 and for future planning in the post-pandemic era. Interestingly, the opinions of family members or members of the Corona family were influenced by the others, and there were more indicators of resilience and prevention. The target group for this study was women, as they play a critical role in connecting the indoor and outdoor environment and can provide essential solutions in future planning.

2.1. Data collection and analysis

This study follows a descriptive-analytical research method with a focus on field studies. Its objective is to identify an appropriate strategy to enhance safety in Tehran using women. All research approaches have been formulated based on global experiences. All indicators in several countries have been extracted according to the position of women (UNISDR, 2018). This study used a descriptive-analytical research method focused on field studies. Its objective is to identify a suitable strategy to enhance safety in Tehran by involving women. The research approaches have been formulated based on global experiences (UNISDR, 2018). The statistical population of this study includes 100 women who have been selected based on the researcher's familiarity with local changes and emphasis on safety conditions. In the first phase of the Delphi technique, an open-ended questionnaire was given to the sample group. The questionnaire focused on the effect of women on the safety of the city, their control over the situation during or before an accident, and their knowledge of their environment and risk factors. The efficiency of the questionnaires was 100% due to the researchers' knowledge of the target group's conditions in the first stage of the Delphi technique. The researchers selected the participants for the study based on their familiarity with the safety conditions in District 14 of Tehran Municipality. This region has a residential function in the Tehran master plan's spatial organization. The sampling method used was systematic randomization. In the first phase of the Delphi technique, a questionnaire with open-ended questions titled "What effect do women have on the safety of the city?" was distributed to a sample group. The questions aimed to gather information on the extent to which women can control the situation before or during an accident, their knowledge of the environment, and risk factors. The efficiency of the questionnaire was 100% due to the target group's familiarity with the conditions in the first stage. In the second stage, variables similar to those in the first stage were removed, and all items were classified based on the mean and standard deviation of the four dimensions of resilience. This study aims to examine the success of Tehran women in terms of resilience in the post-COVID-19 urban environment. The main question of this research is to determine the dimensions of resilience in which women excel and how it contributes to urban resilience with a safety-focused approach. Taking into account the experiences of successful countries in this field with a sustainable level of safety development and field visits at the local level is part of this work. Therefore, after theoretical studies, this research began by visiting the safety situation of Tehran neighborhoods, especially District 14, the impact of the presence and role of women, and answering open-ended questions in this section. Nevertheless, in Iran, the position of women in the field of urban resilience and the post-COVID-19 is still unknown exactly. For this reason, in this study, we used the global scale in previous studies, the level of disease and resilience, and the Delphi technique to extract proper indicators. Therefore, the scale of women in this study is a global scale for a global perspective to classify effective indicators. In fact, with this study, we referred to the post-

pandemic era and discussed the position of women in the field of urban safety and resilience for future planning.

3. Results and discussion

3.1. Findings of the first stage of the analysis data

During the first phase of the Delphi technique, participants were asked about the economic and social conditions in Tehran (Table.1). The main focus was on identifying changes that occurred in the physical conditions of the city during the past year and at the onset of the coronavirus outbreak. The results of this stage led to the classification of extractive indices based on four types of resilience. These types of resilience are outlined in the table below and can be used for inference purposes.

Table 1. Data extraction in the first stage of the Delphi technique

Social resilience	Physical resilience	Economic resilience	Institutional resilience
Age, education, marital status, sense of place, social participation in neighborhoods, skills, local perception of risk, level of service, amenities, recognition of special needs, neighborhood relationship, insurance	Access roads, municipal services, communication lines, residential texture conditions, open space status of the area, incompatible uses, transportation network, temporary emergency shelter, citizen safety equipment	Ownership, employment, income, entrepreneurship, accurate damage estimation, tax safety contribution, safety contribution from the household basket, conservation of production resources in critical situations, control of infrastructure in critical situations, prevention contribution	Administrative Coordination, Liaison with Local Authorities, Unit Management, Functional Framework, trained volunteer staff, Organizational Structure, Political Participation, Strategic Rules, Expert Share

3.2. The second stage

It can be said that the second stage of the Delphi technique was the qualitative evaluation of the first questionnaire according to the available indicators and the average share of data with the help of a sample group (women), which showed which type of resilience can be suitable for controlling post- COVID-19 conditions (Table 2). In the second stage, after classifying the indicators based on the four types of resilience, the average of the indicators was extracted to determine which level of resilience from the perspective of women should be given priority in planning.

Table 2. Classification of extracted data in the second stage of the Delphi technique with emphasis on the dimensions of urban resilience

Row		Variable	Average *	Standard deviation	CV
1	Social resilience	Age	3.62	0.68	0.21
2		Education	2.27	1.17	0.57
3		Marital status	4.3	0.78	0.20
4		Sense of spatial belonging	4.73	0.81	0.23
5		Social participation in neighborhoods	2.1	1.07	0.36
6		Skill	4.23	0.91	0.24
7		Local perception of danger	3.7	053	0.17
8		Service level	1.8	1.06	0.22
9		Welfare amenities	3.92	0.78	0.23
10		Recognition of special needs	4.92	0.75	0.22
11		Neighborhood Communications	3.5	0.81	0.24
12		Insurance	4.7	0.88	0.26
1	Physical resilience	Access routes	4.95	0.83	0.21
2		Municipal services (emergency and fire station)	3.65	0.66	0.19
3		Communication lines (landline, mobile phone, and internet)	4.21	0.89	0.20
4		Residential texture conditions (type, year of improvement and renovation, type of building materials, and date of construction)	4.52	0.69	0.21
5		Incompatible Uses	3.85	1.29	0.32
6		Transport network	3.95	1.14	0.31
7		Temporary emergency shelter	2.96	1.14	0.53
8		Citizen safety equipment	1.32	0.68	0.21
1	Economic resilience	Ownership	4.85	0.81	0.24
2		Employment	2.45	0.98	0.17
3		Accurate damage assessment	3.25	0.68	0.21
4		The share of safety from taxes	4.43	0.71	0.27
5		Contribute to the safety of the household basket to prevent damage	3.63	1.29	0.37
6		Conservation of production resources in critical situations	2.21	1.12	0.16
7		Infrastructure control in critical situations	1.85	1.14	0.53
1	Institutional	Communication with local offices	1.52	0.68	0.21
2		Unit management	0.62	0.78	0.19
3		Functional framework	3.23	0.74	0.23

4		Trained volunteer personnel	2.56	1.19	0.15
5		Organizational Structure	2.21	0.86	1.25
6		Political participation	2.87	0.74	0.18
7		Strategic rules	2.95	0.93	0.16
8		The share of exports	1.47	0.98	0.17

***** Scale: very low= 1, low= 2, medium= 3, high= 4, very high= 5

3.3. The third stage

During the third stage of the study, women discussed the Delphi technique of extractive indices in the second stage (Table 3). They used the Likert scale to identify the effective dimension of urban resiliency. Through this discussion, it was found that the two types of physical and social resilience have the highest mean among resilience indices. This result indicates that planning for post-completion and post-resilience should be based on these two indicators. The superior index was identified in the third stage of the Delphi technique. This stage is identifying the consensus and the indicators of resilience. The study also aimed to identify the dimensions of resilience that can enhance the position of women in the post-COVID-19 era. Interestingly, some of the responses were tied to women's experiences. At the end of this stage, physical and social indicators were found to be more effective than other indicators.

Table 3. Qualitative calculation of data with Likert spectrum in the third stage of the Delphi technique

Row		*Variable*	*Average**	*Percentage of agreement*
1	Social resilience	Recognition of special needs	4.92	93.2
2		Insurance	4.7	83.6
3		Sense of spatial belonging	4.63	81.2
4		marital status	4.3	79.6
5		Skill	4.23	76.8
6		welfare facilities	3.29	75.3
7		Local perception of danger	3.7	71.6
8		Age	3.62	64.5
9		Neighborhood Communications	3.5	58.8
10		Education	2.27	56.4
11		Social participation in neighborhoods	2.1	52.1
12		Service level	1.8	48.7
1	Physical resilience	Access routes	4.95	92.5
2		Residential texture conditions (type, year of improvement, and renovation, type of building materials, and date of construction)	4.52	91.3
3		Communication lines (landline, mobile phone, and internet)	4.21	90.6
4		Transport network	3.95	89.5
5		Incompatible Uses	3.85	87.4
6		Municipal services (emergency and fire station)	3.65	79.8
7		Temporary emergency shelter	2.96	73.5
8		Citizen safety equipment	1.32	45.1
1	Economic resilience	Ownership	4.85	89.4
2		The share of safety from taxes	4.43	72.6
3		The safety contribution of the household basket to prevent	3.63	79.7
4		Accurate damage assessment	3.52	64.3
5		Employment	2.45	60.5
6		Conservation of production resources in critical situations	2.21	51.2
7		Infrastructure control in critical situations	1.85	46.8
1	Institutional resilience	Functional framework	3.23	69.4
2		Strategic rules	2.95	62.5
3		The share of experts	2.87	56.3
4		Trained volunteer personnel	2.56	52.3
5		Organizational Structure	2.21	49.4
6		Communication with local offices	1.52	38.8
7		Political participation	1.47	35.1
8		Unit management	0.62	33.7

* Scale: very low= 1, low= 2, medium= 3, high= 4, very high= 5

Table 4. Percentage of agreement based on the best index

Row		*Variable*	*Percentage of agreement*
1	Social resilience	Recognition of special needs	93.2
2		Insurance	83.6
3		Sense of spatial belonging	81.2
4		marital status	79.6
5		Skill	76.8
6		welfare facilities	75.3
7		Local perception of danger	71.6

8		Age	64.5
9		Neighborhood Communications	58.8
10		Education	56.4
11		Social participation in neighborhoods	52.1
12		Service level	48.7
1	Physical resilience	Access routes	92.5
2		Residential texture conditions (type, year of improvement and renovation, type of building materials, and date of construction)	91.3
3		Communication lines (landline, mobile phone, and internet)	90.6
4		Transport network	89.5
5		Incompatible Uses	87.4
6		Municipal services (emergency and fire station)	79.8
7		Temporary emergency shelter	73.5
8		Citizen safety equipment	45.1
1	Economic ...	Ownership	89.4
2		The share of safety from taxes	72.6
3		The safety contribution of the household basket to prevent damage	79.7
4		Accurate damage assessment	64.3
5		Employment	60.5
6		Conservation of production resources in critical situations	51.2
7		Infrastructure control in critical situations	46.8
1	Institutional resilience	Functional framework	69.4
2		Strategic rules	62.5
3		The share of experts	56.3
4		Trained volunteer personnel	52.3
5		Organizational Structure	49.4
6		Communication with local offices	38.8
7		Political participation	35.1
8		Unit management	33.7

3.4. The fourth stage and reaching a consensus

Finally, in the fourth stage, the Delphi technique and reaching a data consensus were discussed, and the percentage of the final agreement was extracted (Table 4). The method of data collection and analysis with the help of the Delphi technique made it possible to identify the factors of urban resilience from the perspective of women and provide them to planners in this field.

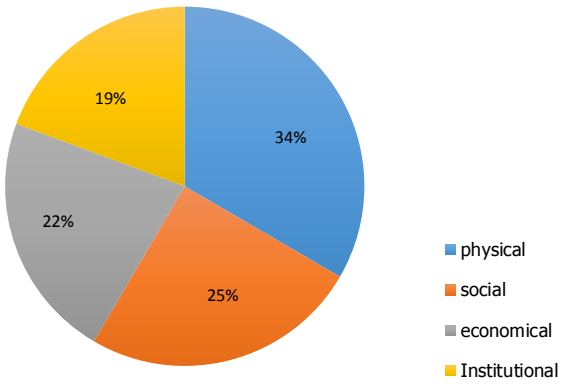

Fig. 2. The fourth stage of the Delphi technique to reach a consensus (100% resilience dimension share)

The results of the research (Fig. 2) by examining the extraction indices of Delphi's 4 stages showed that women have a high ability to control critical situations and accidents with the help of social and physical resilience; hence, the results are described using these two dimensions:

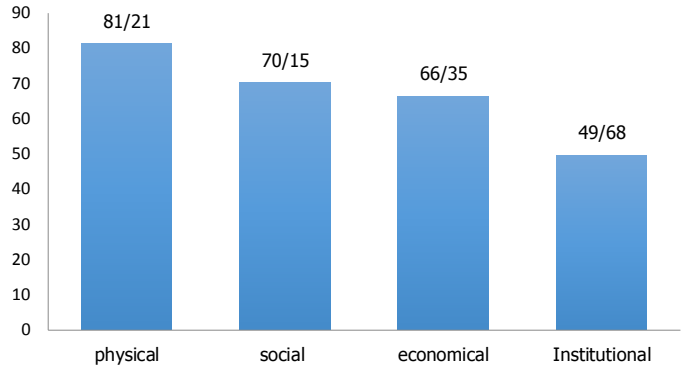

Fig. 3. The results of data extraction and analysis based on Delphi technique

The Delphi 4-steps technique was utilized to extract suitable strategies, beginning with an open-ended question and focusing on research objectives to identify influential factors. The results of the study indicated that women in Tehran place greater emphasis on the social and physical dimensions of resilience (Fig. 3). According to the findings, four indicators - recognizing special needs, insurance, sense of belonging to a place, and marital status - with a maternal perspective can help women identify dangerous and critical environmental conditions. Physical resilience refers to a community's ability to recover from a disaster or economic loss in terms of its physical infrastructure such as shelters, housing units, and medical centers. This assessment is a general measure of the extent of property damage that may occur due to such events. One of the most vulnerable infrastructure components is durable housing, which is often susceptible to damage. Post-event physical resilience indicators can help survey different locations and provide financial resources to planners to maintain safe housing. There is no consensus on explaining resilience indicators, and each study may use indicators based on physical conditions and time of performance in each community. Therefore, this study found that four indicators of access routes, residential texture conditions, communication lines, and transportation, with a focus on the road, could improve physical resilience. This study is a significant addition to the field of urban resilience. It presents a unique approach by integrating gender perspectives into resilience strategies. By highlighting the crucial role of women in decision-making processes and community engagement, this study provides practical guidelines for policymakers in cities worldwide to create more resilient and gender-inclusive urban environments. The inclusion of gender considerations represents an essential step towards improving urban resilience and addressing social inequalities in post-COVID-19 urban planning. Additionally, the study introduces a new conceptual framework for comprehending urban resilience that incorporates gender considerations. This theoretical advancement not only enhances the existing literature but also provides a more comprehensive and holistic understanding of resilience in urban contexts. By incorporating gender into the resilience framework, the study sheds light on the complex interplay among social dynamics, gender roles, and urban planning. This contribution enhances the sophistication of resilience theory, offering a more comprehensive perspective. In addition, the research provides specific suggestions to actively involve women in efforts to build resilience. These practical insights offer guidance to cities worldwide seeking to enhance their ability to withstand future challenges. By advocating for gender-inclusive urban planning and decision-making, cities can tap into the potential of diverse perspectives and experiences, leading to the creation of more adaptable and sustainable communities. The study is based on a solid academic foundation, supported by a comprehensive literature review and in-depth discussions in the discussion section. The study lays the groundwork for its research and identifies gaps in the current knowledge of urban resilience and gender-inclusive planning by conducting a thorough review of relevant literature. The in-depth discussions further emphasize the novelty and significance of the study's findings, offering a critical analysis of the implications for urban planning practices. The study has made significant contributions to the field of urban

resilience by incorporating gender in the study, conducting a comprehensive resilience assessment, and contextualizing it in Tehran. By addressing the challenges posed by the COVID-19 pandemic and its aftermath, the research has enriched the global understanding of urban planning challenges in a post-pandemic world. The study's emphasis on gender-inclusive urban resilience and its theoretical and practical contributions mark a significant advancement in the field of urban planning and resilience studies. Acknowledging the significance of gender perspectives and empowering women as central actors in resilience-building can help cities enhance their readiness for forthcoming crises and foster the development of urban environments that are both inclusive and adaptable. The research's academic rigor and novel insights make it a valuable reference for policymakers, urban planners, and researchers worldwide seeking to create resilient cities in an ever-changing world.

4. Conclusion

This study reveals that in the aftermath of the COVID-19 pandemic, living conditions will change, and people will have to adapt to new conditions to communicate with the environment. The research showed that women could improve the situation in two dimensions of resilience, namely social and physical resilience, which have the greatest impact on managing the COVID-19 epidemic. Therefore, post-COVID-19 planning will require resilience and the role of women. It is suggested that planners with the necessary training should consider women as social elements in urban planning with an emphasis on safety. The legal status of women to participate in citizenship should also be considered. This can be achieved by following an institutional approach based on resilience by utilizing volunteer firefighters at fire stations. Given the ability of women to detect risk, it is recommended that conditions be provided in Tehran for this group to report insecure cases to relevant organizations. Paying attention to women in providing security in Tehran is not only related to the attitude of non-governmental organizations but also professional women who can formally implement their ideas for security in the city. Appropriate training planning to increase the quality of female volunteer firefighters, strengthen neighborhoods to develop a safety culture with women management, strategic planning suitable for women to report the environmental safety status of neighborhoods, and finally create a suitable environment for women specializing in safety planning are some of the factors that create resilience in urban communities. It is important to note that until the real and official position of women in Tehran urban planning is determined, it will not be possible to increase resilience with the help of women. Paying attention to the views of sociologists, psychologists, and urban planners can provide an accurate framework for resilience in the post-COVID-19 era.

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