

Perception and Knowledge of Disaster Risks and Preparedness: The Case of the City of Mohammedia, Morocco [†]

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Abstract: The city of Mohammedia in Morocco is one of the cities threatened by the risks of disasters in general, especially natural and technological ones. For this reason, this article shows the perception of these risks by the city population, including how aware they are of them, and how willing they are to face them, and This article is the first in the field to address this topic. To accomplish this, research was conducted with the population by filling out a form containing a set of questions related to the population's perception of risks and measuring their knowledge of them. In addition, it is important that people's perception of the risks existing in the region where they live aids the process of responding to, and mitigating, damage. The results of this study show that there is a lack of great interest among the population in the subject of disaster risk in their city.

Keywords: risk; disaster; perception; knowledge; Mohammedia

1. Introduction

The knowledge of risks and the disasters associated with them is still severely hampered by the predominance of physical factors that influence risk, without considering social aspects that are also fundamental. Despite the presence of various world programs, of which the most recent is the Sendai Framework for Disaster Risk Reduction, which insists on integrating the awareness dimension into the national programs and policies of countries, implementation is still slow and the programs do not receive the necessary attention [1]. In this context, Morocco has given special attention to some cities, including the city of Mohammedia, which is one of the most likely cities to face natural, technological, environmental, and health [2] hazards in Morocco, due to its history of the occurrence of risks and the losses that caused them. In order to reduce the risk of disasters, work has been done to build infrastructure such as dams, barriers, and insurance against losses. Knowing that one of the disasters that threatens the city is mainly flooding, especially since the city is surrounded by two rivers, for example, the river Oued El Maleh, which causes floods that cause significant losses; what increases the risk is its impact on the largest petroleum region in Morocco, as was witnessed in 2002 [3]. Another significant risk is that the city's coast is vulnerable to tsunamis, as studies have confirmed that the city has already been hit by a tsunami in previous centuries, reaching a height of 8 meters [4].

Among all these dangers, people in the city of Mohammedia remain at risk. This is why the context of this study falls on the assessment of the knowledge of the state of emergency preparedness and risk faced by residents within the community. As a fundamental question, how prepared are community members to respond to disaster risks? The human element is very important for several reasons, including the fact that, in times of risk, the family, neighbors, or relatives are the first to attempt a rescue, before the arrival of official government aid, which sometimes, does not arrive [5].



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Another important factor is that this awareness and knowledge are often confined to workers and employees in the health and security sectors; this would reduce and slow down the response process due to the lack of effective communication between officials and the people [6]. There is a big difference between knowledge and awareness in relation to danger, but they play an integrated role in producing for us the response of the population. Awareness of risk produces worry, and worry stimulates response and readiness to reduce disaster risk through various means available to people [7], so the state of worry is very important and natural if it appears in society, unlike science alone.

The city of Mohammedia is located between $7^{\circ}22'$ and $7^{\circ}25'$ west longitude and $33^{\circ}41'$ and $33^{\circ}43'$ north latitude [8]. It has a population of about 403,390 people, 49.2% males and 50.8% females. The population pyramid of the city of Mohammedia shows that the largest age group is the group from the age of 20 to 34, with an important percentage of infants forming the base and center of the pyramid, unlike the peak where the age ratios decline starting from the age of 54, while the lifespan reaches 75 years and more [9].

2. Methods

In total, 400 forms were filled out by the city population over a period of 3 months (9 March 2022–20 June 2022), in different formats, either through direct interviews or through a link to the electronic form; the samples were randomly identified, provided that they were related to the city of Mohammedia, whether from the population or from its residents, respecting the distribution in the age groups, gender, and residential areas of the city according to the administrative annexes.

The form consisted of 12 questions about the research topic, in addition to 3 questions about personal information, and this form focused on answering 5 areas.

3. Results and Discussion

The gender component of the respondents was distributed in general equivalence, as the percentage of males questioned was 53% and the percentage of females was 47%. The ages included different age groups according to the following divisions: 18 years or younger: 1.3%; 19–25 years: 27.6%; 26–35 years: 42.1%; 36–45 years: 18.4%; 46–55 years: 9.2%; 56 years and above: 1.3%. The places inhabited by the interviewees varied and included all the seven neighborhoods of the city.

From the results of the form, we can draw a set of indicators that categorize the respondents in relation to the following areas (Figure 1).

This area was specific to questions No. (1-2-3-4), which focused on the knowledge of the respondents about the dangers facing the city of Mohammedia, their previous experiences with it, and the extent of their concern in the event of some serious potential risks. Through question No. 1, it was found that the respondent group knows the potential risks in the city of Mohammedia; 46.13% answered yes, and 33.6% answered no, regardless of whether the answer was correct or not, but the percentage that drew our attention was the group that answered that it does not know, which was 19.4%. This category is the one that must be sensitized to the dangers facing the city of Mohammedia. In other words, question No. 3 was explicitly about the respondents' knowledge of the major risks to which the city was exposed, as the results showed that 64% know the major risks that have occurred previously, compared to 36% who do not know about them. The conclusion from this question is that historical memory plays a role in remembering previous events, as the more the population remembers these incidents, the more prepared and aware they are, Ref. [10]. Question No. 4 shows the extent to which the population is concerned about some risks, and this shows the extent to which the population is aware of caution, anxiety, and attention to these risks; and the focus was only on those that threaten the city, and the results revealed that the technological risks related to the petroleum zone of the city and the risk of a tsunami have gained the attention of the respondents. They expressed that the respondents are very worried about their occurrence, and to a lesser extent about the flooding of the river Oued El Maleh; what is also noticeable is the presence of a category of

those questioned who did not react to these risks and answered that they would be in such a normal position, without any concern in the case of potential risks.



Figure 1. Visualizing exposure to risks in the city of Mohammedia in general, and the risks that threaten it especially.

The extent to which the population knows about the projects and plans developed to reduce disaster risk is a positive indicator in the process of risk management in the event of an occurrence, as it makes it easier for the population to know the appropriate measures to take, as explained by questions No. (5–6) on the knowledge of the population of projects and plans (Figure 2). The results of these questions came as follows: the percentage of respondents who are aware of the projects completed to reduce disaster risk in the city of Mohammedia was 18%, and the percentage of those who are not aware of these projects was 42%, while 40% replied that they do not believe in the existence of these projects at all. For question No. 6, 9% said they knew about the city’s disaster risk management plan, while 91% of respondents said they did not know. This is a negative indicator, as a very large percentage does not know how to behave or where to go in the event of danger in the city.

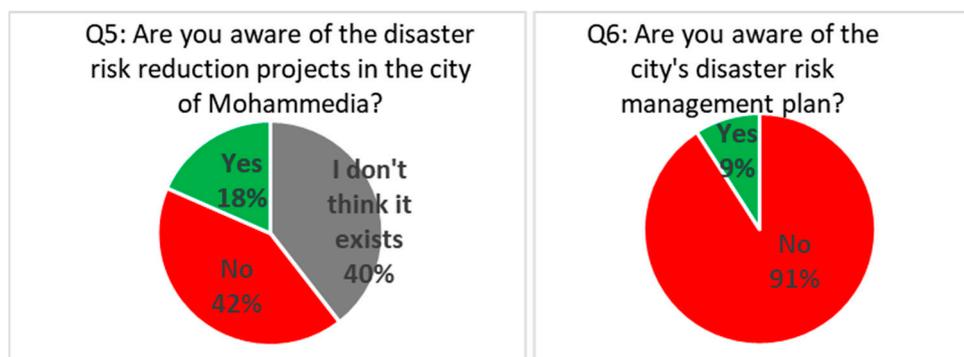


Figure 2. Knowledge of projects and plans developed for disaster risk reduction in the city of Mohammedia.

The feeling of confidence and security on the part of the population towards the local authorities in dealing with the risks is one of the most important factors of stability, spreading reassurance and not worrying the population. If this trust disappears, a set of negative outcomes may occur, such as panic, chaos, and bad organization [11]. This is what is stated in question No. 7 (Figure 3), where the respondents expressed how they felt about the behavior of the local authorities in dealing with the dangers in the city of Mohammedia in the event of an occurrence, and most of the results were largely negative: 30.3% answered that they felt very bad, 36.8% answered that they felt bad, while 1.3% said that they felt very good, and 7.9% said that they felt good about the disposal of the local authorities in the event of risks in the city. This negative feeling of the respondents, representing 74.3%, is a negative indicator, and indicates that any notification that may occur may not help regulate or calm the situation.

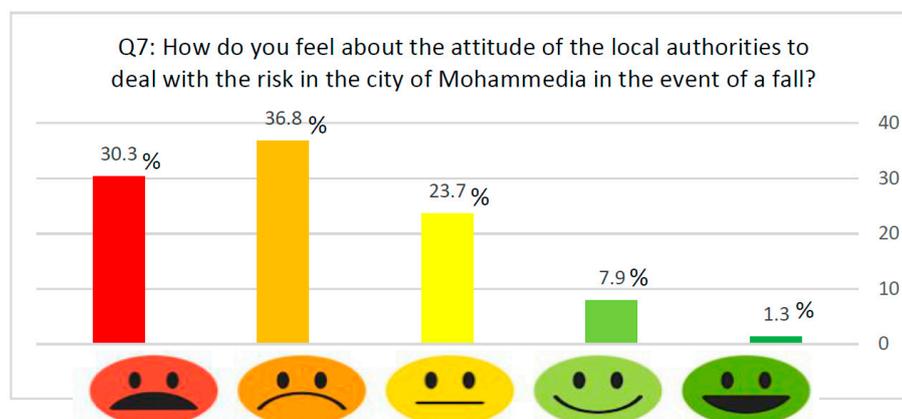


Figure 3. Feeling confident and safe towards the responsible authorities in dealing with risks.

Awareness of the appropriate steps to follow during a disaster is one of the most important factors of survival, saving lives and reducing material damage; this is what is included in questions No. (8–9) (Figure 4). relation to the study or participation in activities related to risk awareness, 51% of the respondents replied that they are not studying or participating in risk education, compared to 20% who participate or study risk education.

Meanwhile, 29% responded that they are thinking about it or have previously been engaged in activities related to risk education. As for the current awareness of the population, results were divided into multiple sections, the first of which was a small percentage of the population (70%) that has knowledge of the potential risks, and the appropriate behavior to follow, followed by 16% who answered definitively that they does not know how to behave or about the potential risks, which in itself is another negative indicator, showing that the culture of awareness of risks and how to behave in the city of Mohammedia, according to the respondents, is weak.

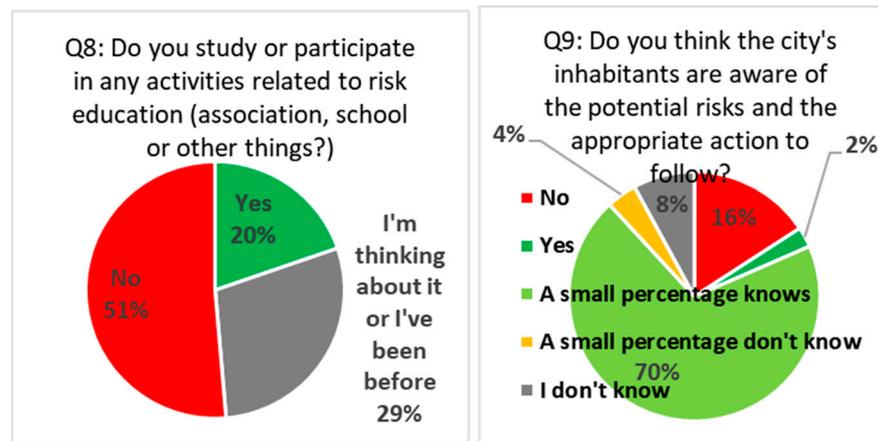


Figure 4. Participation in awareness activities about risks.

Questions No. (10-11-12) showed the extent to which the population is prepared to face risks, and what methods it prefers to use to communicate in critical cases (Figure 5). It can be a suggestion as to what the population prefers, as the respondents preferred social networking sites in the first place, and then sirens, and this is what the local authorities can work on to achieve effective communication and warning. One of the positive indicators that was identified in this questionnaire was solidarity and the readiness to help the population in case of danger; 70% of the respondents replied that they are fully prepared to participate in training, preparedness, the exchange of information, donation, etc., while only 9% were unwilling to participate in any of the proposals put forward and 21% did not know what they could or could not participate in them. With regard to insurance against catastrophic events, 7% of the respondents replied that they have it, unlike 67% of the respondents, whom we can integrate with the 26% who replied that they were not aware of its existence. This poses the following problem: Is the population aware of the existence of this insurance system or not?

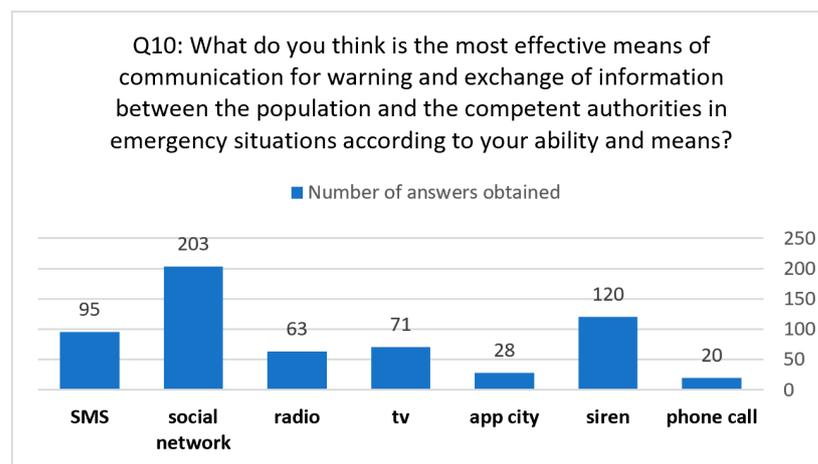
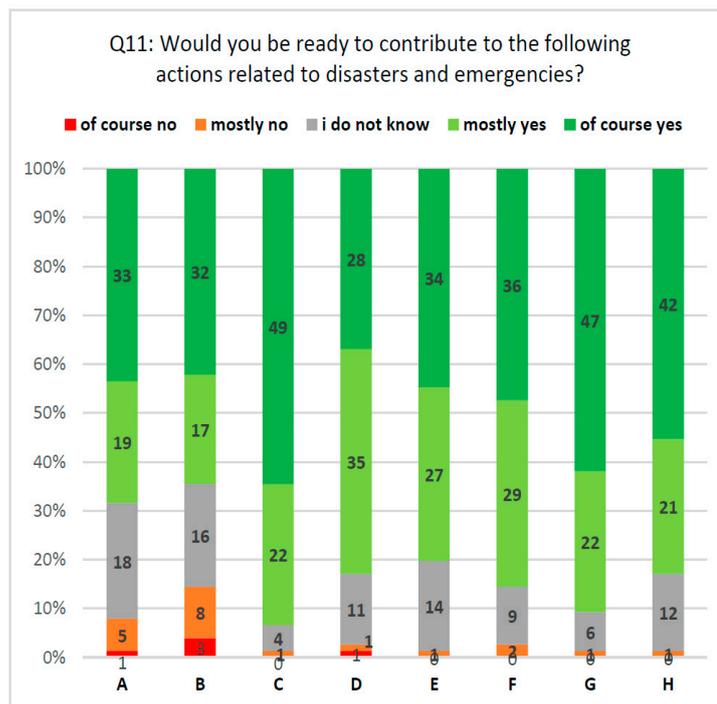


Figure 5. Cont.



A: Participation in training Preparedness and volunteering; B: Collection of risk control data; C: Report risk; D: Report a simple case; E: share information about safe spaces and available resources; F: share information about safe and appropriate behavior to act; G: Exchange of useful information with citizens; H: Blood donation, lunch and shelter of affected people.

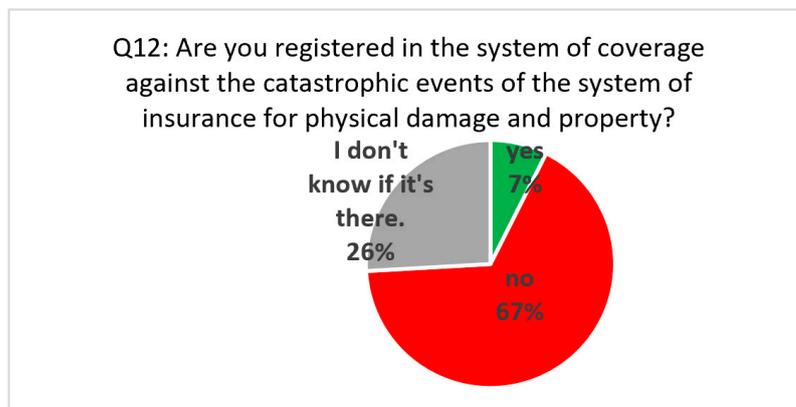


Figure 5. Methods of communication, exchange of information and static readiness in case of risk.

4. Conclusions

This study is important due to the subject studied, although it does not address several levels such as gender, social, economic, and educational level. However, through the results, many indicators have emerged, showing the extent to which the city population understands the risks of disasters facing them. Therefore, in order to derive value these results, we recommend paying attention to the awareness of the population regarding risks, and then working to teach appropriate actions in case of risk. This is not a but it is a strategic plan that intersects with all levels, whether in the educational, health, security, or infrastructure sectors within the city of Mohammedia. Therefore, the responsible authorities must take into account a set of observations, especially the negative ones, which showed the significant work required to improve and raise risk awareness among the population, especially in areas such as knowledge, behavior, methods of communication and the exchange of information in situations of risk.

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