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Original Research

Level of Awareness about Air Pollution among Decision-makers in Jordan: Unveiling Important COPD Etiology

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Abstract

Purpose: The complete awareness of policymakers about air pollution can play a significant role in dealing with this environmental threat. This study aimed to examine the awareness and perception among the policymakers regarding air pollution in Jordan. **Methods:** This is a cross-sectional study conducted in Jordan. The participants included in this study were governmental and non-governmental officials from different sectors. An interview and questionnaire were used to examine the extent of knowledge of these decision-makers regarding air pollution types, sources, and threats. **Results:** Most participants acknowledged that air pollution in Jordan was a huge problem. Most participants (90%) were familiar with the term air pollution, and regularly read about different contaminants that cause air pollution. However, most of the participants had a low level of knowledge about air contaminant types in Jordan. The least known pollutants were PM2.5 (Particulate Matter 2.5 microns in width) and PM10 (Particulate Matter 10 microns in width). Only 7.5% of the participants knew about PM2.5, while 12.5% knew about PM10. **Conclusion:** Policymakers have the full authority to initiate and implement policies that intend to limit air pollution. Their complete awareness of air pollution can result in conducting certain protocols to approve new policies and legislations that can improve the air quality in Jordan. Unfortunately, no previous studies were conducted to analyze policymakers' knowledge regarding air pollution in Jordan, and this study's results hoped to reflect the importance of air pollutants and their greater significance on public health.

Keywords: air pollution; COPD; knowledge; policymakers; middle east

INTRODUCTION

Environmental Pollution Centers describe air pollution as the existence of materials, which are hazardous and harmful chemicals and gases, in the air, at levels that pose a health risk.[1] Additionally, air pollution is defined as the addition of pollutants into the environment that is damaging to the human health system, and the planet is impacted too.[2]

Air pollution is known as one of the significant problems and a hazard to a living creature, many health conditions can occur due to the presence of different kinds of air pollution in the environment like COPD (chronic obstructive pulmonary disease), asthma, and allergic rhinitis. Smog and soot which occur due to the combustion of fossil fuels react with sunlight and soot is made up of tiny particles of chemicals, dust, or allergens, in the form of gas or solids. This is an important and serious problem because it can harm delicate eyes, and throat and damage the lungs of a wide range of the population, cancers, and many more health problems can occur due to air pollution.[3] A study was conducted by Al-Zu'bi et al. (2015) to examine the effects of supply chain integration on the environmental performance of food manufacturing companies in Jordan and the results showed that supply chain integration positively affected environmental control and pollution management.

Government officials and policymakers can play a significant role in alleviating the harmful impact of air pollution by formulating policies to control this problem.[4] Air pollution is a major concern around the globe and policymakers can make their efforts to integrate approaches related to air pollution and climate change. Global warming and air pollution are critical subjects that can impact the overall health of living creatures and can even lead to death, so, awareness regarding such topics among government officials is mandatory.[5]

Jordan's government has already set some environmental policies since 2006 to regulate industrial and traffic emissions but few more reforms are required to save the country from drastic air pollution.

The risk management strategies and environmental policies should be fully employed for the making of a sustainable air pollution plan. However, the focus shifts when air pollution is not controlled due to a lack of awareness leading to extreme health-related issues, on the other hand, the excessive

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poisonous gasses in the air can lead to premature aging and increased mortality.[6]

Jordan is counted among most countries that have been severely impacted by the issue of air pollution. Unfortunately, studies have not been conducted in Jordan to examine the extent of awareness of the decision-makers about the problem of pollution in Jordan.

Policymakers are in authority for initiating and implementing policies that intend to limit air pollution and their complete awareness of air pollution can result in protocols that can improve the quality of air in Jordan. At the same time, policymakers might accept the support of the community to guarantee there are no policy failures.[7] Air pollution is a global issue now if the policymakers and the public support each other to tackle this environmental hazard it can be a beneficial step towards the reduction of pollutants from the air and can save millions of lives by improving public health.[8]

To prevent public health issues, it will be best for policymakers to work actively to achieve the goal of improving air quality. The current cross-sectional study focuses on the importance of the awareness of decision-makers on the problem of environmental pollution, as well as the measure of the awareness of decision-makers on the problem of air pollution in Jordan. This study aims to assess and estimate the level of awareness about air pollution the government officials in Jordan possess.

MATERIALS AND METHODS

Study design and participants

The study design used in this investigation was a descriptive cross-sectional study. Face-to-face interviews were conducted with government officials working in policy-making positions related to environmental protection or areas related to air pollution. The judgmental (purposive) sampling was suitable to meet the objectives of this study as it relies on judgment when choosing participants for the research who are believed to have the experience and knowledge enough to meet the targets of the study.[9]

The study population was persons working in a decision-making position related to the environment or air pollution in different governmental departments in Jordan. Notable decision-makers included in this study were working in the departments named below:

- Ministry of Environment.
- Ministry of Agriculture.
- Royal Society for Environmental Protection.
- Municipalities.
- Meteorological Authority.
- Civil Defense directorates.
- Police directorates responsible for giving environmental violations.
- Civil servant societies that raise awareness about air pollution.

Instrument

Research questions were based on studies related to the topic and modified to meet the objectives of the study.[4,6,10-18] There was a total of 19 multiple–choice questions in the interview, divided into the following:

Two questions on the place of work and position. However, the position was not included in the results to ensure the privacy of participants and protect the confidentiality of the research information.

Eight questions about the knowledge of air pollution and its effects

Three questions on communicating air pollution with the public

Six questions about ways to reduce and control air pollution

The study questions were developed in English and checked by two public health research experts and confirmed their validity. The questions were then translated into Arabic and an academic expert, who was blinded to the original English form translated the Arabic version into English to check the validity of the translation. The original meanings of the questions were preserved, and the translated Arabic version was found valid for the interviews.

Data collection

Although this was purposive sampling, not all the intended participants were able to be reached. Thus, a person working in the same department whose qualifications and position were the closest to the person initially selected was chosen as an alternative. For example, none of the ministers who were selected for participation could be reached and therefore, another prominent employee was selected instead for the interview after receiving the consent.

All interviews were personally conducted in the office of the participant and were completed by one of the investigators. Within the interviewees, the participants were informed about the purpose of the study, and the willingness to participate was obtained through oral and written consent. Interviews were completed between January and November of 2019. The duration of the interviews ranged from 10 to 15 minutes.

Ethical Implications

Although this was purposive sampling, not all the intended participants could be reached. Thus, a person working in the same department whose qualifications and position were the closest to the person initially selected was chosen instead to participate and served as an alternative. For example, none of the chosen ministers for participation could be reached; therefore, another prominent employee was selected instead for the interview after receiving consent. This study was approved by the JUST ethics committee and complied with the Declaration of Helsinki.

Statistical Analysis

Descriptive statistics, including numbers and percentages, were used to describe participants' knowledge and perceptions of air

Table 1. Job titles and place of work for each of the participants

	JOB TITLE	INSTITUTION NAME
1	Environmental Observer	Ministry of Environment / Shmeisani
2	HR department	Ministry of Environment / Shmeisani
3	Vice president	Ministry of Environment / Shmeisani
4	Vice president	Ministry of Environment / Shmeisani
5	Director of human resources	Environment Police Directorate
6	Logistics Support Manager	Environment Police Directorate (Zarqa)
7	Manager	Environment Police Directorate (Marka)
8	Vice president	Environment Police Directorate (Marka)
9	Manager	Environment Police Directorate (Sahab)
10	vice president	Environment Police Directorate (Sahab)
11	Manager	Environment Police Directorate (Madaba)
12	vice president	Environment Police Directorate (Madaba)
13	Manager	Environment Police Directorate
14	Vice president	Environment Police Directorate
15	Manager	Ministry of Health, Department of Environment / Zarqa
16	Vice president	Ministry of Health, Department of Environment / Zarqa
17	Environmental Observer	Ministry of Health, Department of Environment / Zarqa
18	Environmental Observer	Ministry of Health, Department of Environment / Zarqa
19	Manager	Civil Defense Directorate / Shmeisani
20	vice president	Civil Defense Directorate / Shmeisani
21	Manager	Civil Defense / Qweismeh
22	vice president	Ministry of Health, Department of Environment / Sahab
23	Environmental Observer	Ministry of Health, Department of Environment / Sahab
24	President	Local associations / Um Nawara
25	Manager	Ministry of Health / Umm Nawara Health Center
26	Environmental Observer	Local Associations / Amman Municipality
27	Manager	Ministry of Health, Department of Environment / Sahab
28	Awareness-raising official	The Royal Society for Environmental Protection
29	Environmental Observer	Abu Alanda municipality + Sahab
30	Permits Department official	Abu Alanda municipality + Sahab
31	vice president	Abu Alanda municipality + Sahab
32	Environmental Observer	Abu Alanda municipality + Sahab
33	President	Abu Alanda municipality + Sahab
34	President	Municipality of the Southern Mazar District
35	Vice president	Weather Service
36	Director of the Agricultural Food Office	Ministry of Agriculture
37	President	Ministry of Agriculture
38	Environmental Observer	Ministry of Agriculture
39	Laboratory manager	Ministry of Agriculture
40	Plant Protection Director	Ministry Of Agriculture

pollution. Analysis was performed using the Statistical Package for the Social Sciences "SPSS" software version 23.

RESULTS

Characteristics of the study participants

A total of 40 government officials completed the interview and their information was included in the analysis. Table 1 shows their job titles and the name and location of their ministry or department.

When participants were asked about their respiratory health, 90% denied any respiratory disease, and 70% answered that they don't suffer from allergies to dust, pollens, or smoke, as shown in Figure 1.

Knowledge and perceptions about air pollution

Table 2 illustrates the responses of interviewees to some indicators that reflect their knowledge and perception of the quality of air in Jordan. Less than one-quarter (20.0%) perceived the quality of air in Jordan as unhealthy in general and 22.5% reported that the quality of air is unhealthy for a special group of people, and the rest believed that it's moderate or good (Table 2).

All interviewees agreed to the fact that air pollution is a critical issue that must be addressed, 95.0% of them were familiar with the term 'air pollution, and 90.0% read about air pollution. Yet, many participants had a low level of knowledge about the commonly known air pollutants. For instance, only 7.5% heard about $PM_{2.5}$ and 12.5% heard about PM_{10}. Other pollutants were a little more known to them than particulate matter. Nonetheless, the wording of the pollutant made a difference in responses (e.g., CO vs carbon monoxide); the full name of the chemical was more recognizable to them than the symbolic abbreviation except for NO_2 as shown in Table 2.

Regarding participants' knowledge about the health effects of air pollution, only a small proportion of them were aware of the various systematic adverse effects of air pollution on the human body. The only exception was their agreement that air pollution may cause respiratory problems (87.5%). Moreover, around two-thirds of participants (62.5%) believed that there are enough laws to reduce air pollution in Jordan (Table 2).

Communication of air pollution

Most participants (87.5%) agreed that information about air

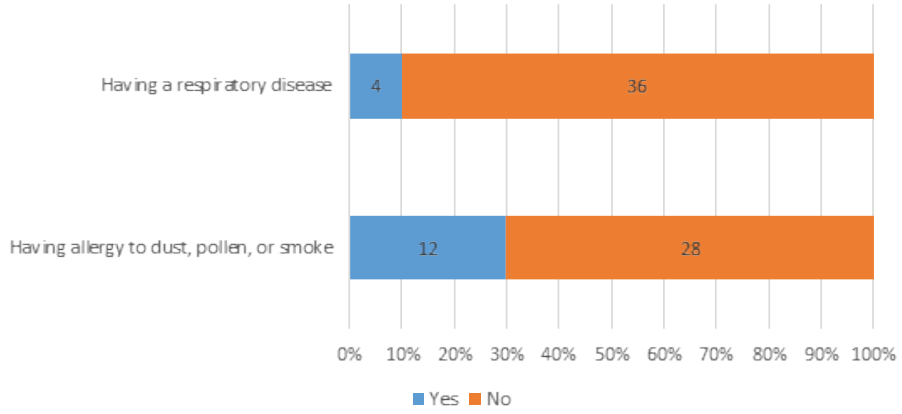

Figure 1. Respiratory health problems of participants

Table 2. Knowledge and perception of participants about air pollution in Jordan

Question	Response	N (%)
How do you rate the quality of air in your area of residence?	Good	3 (7.5%)
	Moderate	20 (50.0%)
	Unhealthy to a specific group of people	9 (22.5%)
	Generally unhealthy	8 (20.0%)
Do you think that air pollution is a critical issue that must be addressed?	Yes	40 (100.0%)
Have you heard about the term “air pollution” before?	Yes	38 (95.0%)
Do you read about air pollution?	Yes	36 (90.0%)
Have you heard of CO before?	Yes	17 (42.0%)
Have you heard of Carbon Monoxide before?	Yes	21 (52.5%)
Have you heard of O_3 before?	Yes	10 (25%)
Have you heard of O_2one before?	Yes	18 (45.0%)
Have you heard of NO_2 before?	Yes	17 (42.5%)
Have you heard of Nitrogen dioxide before?	Yes	14 (35.0%)
Have you heard of SO_2 before?	Yes	8 (20.0%)
Have you heard of sulfur dioxide before?	Yes	13 (32.5%)
Have you heard of PM10 before?	Yes	5 (12.5%)
Have you heard of PM2.5 before?	Yes	3 (7.5%)
Do you think we have enough laws in Jordan to reduce air pollution?	Yes	25 (62.5%)
Does air pollution cause heart diseases?	Yes	13 (32.5%)
Does air pollution cause respiratory diseases?	Yes	35 (87.5%)
Does air pollution cause skin diseases?	Yes	7 (17.5%)
Does air pollution cause nervous system diseases?	Yes	9 (22.5%)
Does air pollution cause problems with behavior?	Yes	7 (17.5%)
Does air pollution cause problems with pregnancy and childbearing?	Yes	4 (10.0%)

pollution should be disseminated to the public, in addition to the dissemination of information on the sources of pollution (60.0%) (Table 3). Participants were divided equally on whether the public should receive information about ways to reduce pollution. Interestingly, more than half of the participants (57.5%) didn’t believe that information about the levels of air pollution should be disseminated, and neither did they believe that information about ways to protect ourselves from pollution should be disseminated (67.5%). However, interviewees had different opinions regarding the best vehicle for the transmission and dissemination of information (Table 3); social media was the most reported vehicle (60.0%) whereas the newspapers were the least reported vehicle (7.5%).

Table 3. Communication of air pollution to the public	
Questions	**N (%) of agreement**
Should we disseminate information about air pollution to the public?	35 (87.5%)
Should we disseminate information about levels of air pollution?	17 (42.5%)
Should we disseminate information about sources of air pollution?	24 (60.0%)
Should we disseminate information on how to reduce pollution?	20 (50.0%)
Should we disseminate information on ways to protect ourselves from pollution?	13 (32.5%)
Should we disseminate information on how to advocate for clean air?	14 (35.0%)
Special Website is the best vehicle for transmitting information about air pollution to the public?	12 (30.0%)
TV channels are the best vehicle for transmitting information about air pollution to the public	13 (32.5%)
The daily newspaper is the best vehicle for transmitting information about air pollution to the public	3 (7.5%)
Radio is the best vehicle for transmitting information about air pollution to the public	13 (32.5%)
Social media is the best vehicle for transmitting information about air pollution to the public?	24 (60.0%)

The role of governmental and non-governmental agencies in reducing air pollution

Participants believed that reducing air pollution is mostly the responsibility of the government (52.5%) followed by the public (45.0, whereas only 12.5% believed that non-governmental organizations (NGOs) share this responsibility. It's also believed that the government's role in reducing pollution is via imposing sanctions on factories that cause pollution (55.0%) and via carrying out awareness campaigns about air pollution (52.5%). Other ways of reducing pollution were to get rid of waste in an environmentally friendly way and use a transportation system more friendly to the environment (37.5% each) (Table 4).

NGOs could help in reducing air pollution by carrying out awareness campaigns about ways to maintain air quality (55%), using billboards about air pollution in public places (52.5%), and distributing flyers to educate people about air pollution (40%).

Participants also added that factory owners' role in reducing pollution is possible via building factories away from cities (62.5%), placing air filters on the factory funnel (42.5%), and increasing awareness among employees about the importance of maintaining air quality (27.5%). Other roles in reducing air pollution were the public role, which was believed to occur through smoking cessation (62.5%), the prohibition of burning garbage in street areas (50%), participation in air conservation campaigns (47.5%), and educating children about air pollution (40%) (Table 4).

When interviewees were asked about the most effective way to make people friendly to the environment in the long run, they responded: teaching students in schools and universities about the importance of the environment (57.5%), encouraging people to use public transportation, electric cars, and solar-powered systems (47.5%), and set an annual day to raise awareness about air pollution (35.0%) (Table 4).

Table 4. The role of governmental and non-governmental agencies in reducing air pollution	
Question	**N (%) of agreement**
Reducing air pollution is mainly the responsibility of the government?	21 (52.5%)
Reducing air pollution is mainly the responsibility of the public?	18 (45.0%)
Reducing air pollution is mainly the responsibility of non-governmental organizations?	5 (12.5%)
The government's role in reducing pollution is via imposing sanctions on factories that cause pollution?	22 (55.0%)
The government's role in reducing pollution is by providing more public buses to reduce car exhaust?	15 (37.5%)
The government's role in reducing pollution is by finding practical solutions to get rid of waste in an environmentally friendly way?	15 (37.5%)
The government's role in reducing pollution is by carrying out awareness campaigns about air pollution?	19 (52.5%)
NGOs could help by distributing flyers to educate people about air pollution?	16 (40.0%)
NGOs could help by carrying out awareness campaigns about ways to maintain air?	22 (55.0%)
NGOs could help by using billboards about air pollution in public places?	21 (52.5%)
Factory owner's role in reducing pollution is via Placing a filter on the factory funnel?	23 (42.5%)
Factory owners' role in reducing pollution is via Building factories away from cities.	25 (62.5%)
Factory owners' role in reducing pollution is via increasing awareness among employees about the importance of maintaining air?	11 (27.5%)
Stop smoking is considered a public role in reducing air pollution?	15 (37.5%)
Stop burning garbage on the street is considered the public role in reducing air pollution?	20 (50.0%)

Participating in air conservation campaigns is considered the public role in reducing air pollution?	19 (47.5%)
Educating children about air pollution is considered the public role in reducing air pollution?	16 (40.0%)
Teaching students in schools and universities about the importance of the environment is the most effective way to make people friendly to the environment in the long run?	23 (57.5%)
Set an annual day to raise awareness about air pollution is the most effective way to make people friendly to the environment in the long run?	14 (35.0%)
Encouraging people to use public transportation, electric cars, and solar-powered systems is the most effective way to make people friendly to the environment in the long run?	19 (47.5%)

DISCUSSION

This study aimed to evaluate the level of awareness about air pollution and ways of communication with the public among government officials of Jordon. This study collected data from direct interviews of 40 officials working at different governmental levels. The majority of the participants acknowledged that air pollution in Jordan was a huge problem; 95% were aware that Jordan was facing a problem of air pollution. Most of the participants (90%) were also familiar with the term air pollution, and they regularly read about different contaminants that cause air pollution. However, the majority of the participants had a low level of knowledge about air contaminants in Jordan. The pollutants that were least known were $PM_{2.5}$ and PM_{10}. Only 7.5% of the participants knew about $PM_{2.5,}$ while 12.5% knew about $PM_{2.5}$ pollutants. Other pollutants such as carbon monoxide and nitrogen oxide were more recognizable by the participants. Another interesting finding in this study is that the full name of the chemical pollutant was more recognizable than the symbolic abbreviation. For example, CO was not as much recognizable as carbon monoxide. The most common pollutants in Jordan, which make up 90% of air pollution are, CO, O3, SO2, and NO2 [12]. However, most policymakers were not aware of some pollutants such as PM10 and PM2.5.

As defined by Orru[15], air pollution is the addition of hazardous chemicals and gases in the air to levels that pose health risks to people. However, studies have found that air pollution can be controlled depending on the decision-makers, knowledge of the drastic impact of air pollution on the environment, and the overall impact the degradation of the environment has on people[13]. Therefore, awareness of air pollution and designing the right campaigns to protect the environment play a vital role in providing information to policymakers about the threat air pollution has on the environment. Government officials and policymakers are responsible for formulating policies and regulations that can control the harmful impacts of air pollution on the general public.

Jordan is one of the countries that are most affected by air pollution. However, studies have not yet been conducted in Jordan to determine the extent to which the government and other governmental bodies responsible for pollution control are aware of air pollution. The authorities' awareness of the extent to which air pollution has affected the country is important in formulating policies that can solve the specific pollution problem affecting Jordan. According to the WHO, the air quality in Jordan is moderately unsafe to the general public due to the high concentration of pollutants. The annual mean pollutant concentration for the air in Jordan is 33 µg/m3. This means the concentration is way above the concentration recommended by the World Health Organization, 10 µg/m3[19]. The concentration levels of pollutants are too high, and the lack of awareness of the authorities could be one of the causes of such high concentrations.

With regards to communication with the public, the study found that 87.5% of the participants thought that the public should be informed about air pollution and its effects on the public. The interesting fact about the dissemination of pollution information to the public is that the participants were divided on the ways that the information should be disseminated to the public. Slightly more than half (57.5%) of the participants believed that information about the levels of pollution in the country should not be disseminated to the public. Around two-thirds (67.5%) of the participants believed that the information on the levels of pollution in the country should be disseminated to the public so that the public can take measures on how to control pollution.

Surprisingly not much difference was found on who was responsible for controlling air pollution in the country; 52% of the participants believed that it was the government's responsibility to control air pollution in the country, while 45% believed that it was the responsibility of the public. Whereas, 12.5% of the participants had a different opinion, and they believed that non-governmental organizations should share the responsibility of controlling air pollution in Jordan. Regarding ways to control air pollution in the country, 55% of the participants believed that the government should control air pollution by imposing sanctions on factories that contribute to air pollution. 52.3% believed that creating awareness of air pollution to the public would help control pollution. The remaining participants believed that adopting environmentally friendly modes of transportation would also reduce air pollution in Jordan.

According to the WHO, 15% of Jordan's population suffers from heart disease[19]. The same is reflected in the respondents who participated in the study. 10% of the participants were suffering from respiratory diseases might be due to air pollution. Despite the high levels of pollutant concentration in the air, 90% of the participants stated that they did not suffer from any respiratory disease. Also, 70% of the participants did not suffer from any allergies to dust, pollen, or smoke, and 30% of the participants were allergic to smoke, dust, and pollen. A possible explanation for the heart and respiratory diseases among 15% of the population in Jordan might be because although the general

public is aware of air pollution in Jordan, the public is still not aware of the levels of toxicity of the air in Jordan. The participants are also divided on whether the public should be informed of the toxicity levels in Jordan or not informed. The lack of information by the public on the toxicity of the air the general public is breathing makes the public unable to take the necessary preventive measures that could reduce the effect of air pollution on the general public.

However, according to the WHO, and the Sustainable Development Goals (SDGs), each country has a role in controlling pollution, and the National government should drive the role. Therefore, the policymakers and government officials in Jordan should understand that it is their responsibility to come up with regulations and laws that will guide the general public in controlling the rate of pollution in the country. Therefore, the policymakers should be made aware that they are responsible for controlling air pollution in Jordan. This study was successful because it established reasons why there is a high rate of air pollution in Jordan despite the country having policymakers who can control the rate of air pollution.

It can thus be suggested that the policymakers and government officials who are responsible for creating and implementing policies to control air pollution must be informed through scheduled seminars conducted by other professionals on their role in controlling air pollution in the country. The officials should be well informed about the effects of air pollution on the people's health in Jordan, the causes of the pollution, and the best ways that air pollution can be controlled. These can only be facilitated by informing government officials and providing proper funding to conduct research studies and find out the major sources of high rates of pollution in the country and the suggested methods of control.

Despite the promising results from this study, it is still not clear what kind of information the policymakers should possess to generate the required policies and regulations that can control the rate of air pollution in Jordan. The majority of the participants were aware of the different types of pollutants and the level of pollution in the country. However, a good number of the policymakers were not fully aware of who was responsible for controlling pollution in the country. Therefore, further research should be conducted to identify the information needed to improve the air quality in Jordan. The public was not involved in the research, and therefore additional research should be conducted involving the public. The public should be asked to identify what policymakers are not doing right to control air pollution in the country.

The severity of air pollution can be controlled significantly if the decision-makers have high knowledge about the drastic impact of air pollution on the public and the environment. Thoughtful awareness of air pollution and designing campaigns for environmental protection can play a vital role in informing policymakers about this environmental threat.

The key environmental stakeholders must keep the public and the decision-makers well aware of the risks associated with air pollution. The air quality issues may continue to rise which can lead to more severe health and environmental issues, raising concerns about the planet's survival. To avoid all these problems there should be a constant campaign, sensitization, forums, and also community meetings to help the public along with government officials to be aware of the disastrous impact of air pollution. Human activities have a great impact on the environment it is crucial to educate the general public to refrain from activities that can harm our healthy environment.

Studies carried out regarding air pollution spread awareness about the risk factors to human health among the policymakers and public. They help the citizens to know the quality of air, the devastating health impact, and the economic loss of the country, and this also assists government officials in making strategic plans to curb the menace.

The present study sheds light on the level of awareness among decision-makers about air pollution in Jordan, and its consequences on human health. Also, the importance of awareness especially in decision-makers to improve the quality of air in Jordan. Air pollution is a very crucial public health problem that should be given proper attention; therefore, the decision-makers must form a valid committee to address this particular concern.

Future studies would concentrate on creating awareness through environmental campaigns in collaboration with both policymakers and the public.

To become a successful and healthy nation, awareness should not only be limited to decision-makers rather the general public can make a huge contribution to improving the quality of air by reducing automobile usage or any other activity that creates air pollution. The government, key stakeholders, and judicial bodies can play an effective role in forming special regulations to control industrial and human activities. Government officials can also update the policies set for the maximum level of pollutant gas emission, motor vehicle emission, Sulphur oxide gas emission, heavy metal, and particulate matter so that they can formulate new required policies. The primary focus should be to reduce Jordan's annual mean concentration of PM2.5 to a lower value which WHO recommends. Though, there should be a long-term solution to the current air pollution issues which can be achieved by spreading awareness regarding the harmful effects of air pollution on human health.

CONCLUSION

The present study sheds light on decision-makers' awareness level about air pollution in Jordan and its consequences on human health. Air pollution is a crucial public health problem that should be given proper attention; therefore, the decision-makers must form a valid committee to address this concern.

Future studies would concentrate on creating awareness through environmental campaigns in collaboration with policymakers and the public.

Awareness should not only be limited to decision-makers instead; the general public can make a huge contribution to

improving the quality of air by reducing automobile usage or any other activity that creates air pollution. Government officials can also re-check the policies set for the maximum level of pollutant gas emission, motor vehicle emission, Sulphur oxide gas emission, heavy metal, and particulate matter to formulate new required policies. The primary focus should be to reduce Jordan's annual mean concentration of PM2.5 to a lower value which WHO recommends. However, there should also be a long-term solution to the current air pollution issues, which can be achieved by spreading awareness regarding the harmful effects of air pollution on human health.

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DISCLOSURE

no conflict

The authors report conflicts of interest in this work.

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