



Saudi Arabia
Ministry of Education / Sabya



search title

**Study of hot springs and their impact on human
health in Jazan region.**



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Date / 2025 AD

Summary:

This study aims to know the benefits of hot springs for human health and the appropriate times to visit them. Through our research on them, we began to suggest the following:

Research questions and hypotheses:

What is the effect of hot spring water on human health?

Hypothesis:

There is an effect of hot spring water on human health.

procedures:

We used the descriptive survey method and created a questionnaire that was distributed to a random sample.

Results:

There is a relationship between hot springs, human health, entertainment, and mental health, and the most appropriate times to visit the hot springs in the Jazan region are in the winter and spring seasons at a high rate, due to the high air temperature in the summer and fall seasons. The analysis data showed that there is an inverse relationship between the temperature and the appropriate times to visit the hot springs and the change in weather. The higher the temperature, the fewer the number of tourists to the area.

Conclusions ,

It has been proven that hot spring water has effects on human health, as it is a cure for many diseases, due to the sulfurous water.

Search terms,

Hot springs: hot water sources containing minerals emerging from the ground.

Health recreation: using hot springs for treatment and recovery..

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Brief synopsis:

This study aims to find out the benefits of hot springs for human health, and through our research on them we began to suggest the following:

Research questions and hypotheses:

What is the effect of hot spring water on human health?

Hypothesis:

There is an effect of hot spring water on human health.

Variables:

Independent: Hot springs.

Subordinate: human.

Research objectives:

Identify the effect of hot springs on human health.

Developing therapeutic programs that use hot springs for treatment.

The importance of the research:

It contributes to knowing the effect of springs on human health.

Helps understand how hot springs affect overall health.

Developing new treatments for various diseases.

Research limits:

Objective: Study of hot springs and their impact on human health in the Jazan region

Time: 2025 AD.

Location: Jazan region.

Search terms:

Hot springs/a hot water source that contains hot sulfurous materials that emerge from the ground from several springs in the region through the rocks that make up the terrain and continue to flow from their source.

Healthy recreation/using hot springs as tourist facilities for hospitalization and treatment.

the introduction:

Hot springs are one of the natural phenomena that have aroused human interest since ancient times, as they are considered one of the natural sources used for treatment and physical and psychological comfort. These springs represent water flowing from the ground at high temperatures, and they contain minerals and elements that can positively affect human health.

In many cultures around the world, hot springs have been considered a source of healing, with people using them for bathing or physical therapy to relieve many diseases and physical tensions.

By researching this phenomenon, it is possible to study the effect of hot springs on the human body, and how people can benefit from them in enhancing public health. Whether through the physiological effects of hot water or through the psychological effects resulting from the relaxation and comfort that these springs provide. It is also possible to consider the interaction between the chemical components of this water and the human body and the role of these elements in promoting recovery from some diseases.

Benefits of hot springs in Saudi Arabia:

Sulfur water has been discovered since ancient times, and it contains proportions of hydrogen sulfide and hydrogen disulfide.

Hot springs in Saudi Arabia are famous for their many benefits, such as:

Growing plants, as it works to reduce the percentage of sodium in the soil, which contributes to improving plant growth. Sterilizing vegetables and fruits that farmers want to dry,

This is thanks to the properties of sulfur water, which expels various types of impurities.

Accelerating the wound healing process.

Accelerate healing of skin diseases.

It helps treat skin ulcers and prevents their aggravation.

Improving oral health and preventing tooth decay, as it is one of the solutions that help in disinfecting and sterilizing the mouth.

Strengthening the joints, as sulfur water represents one of the natural solutions that helps relieve joint pain and relieve pain associated with rheumatism.

Improving hair health by using water topically on the hair, as it contributes to the prevention of various hair problems.

Improve skin health; Sulfur water exfoliates the skin and gets rid of dead cells. It also helps tighten the skin and get rid of wrinkles.

The correct period of time to stay in sulfurous water in Saudi Arabia for treatment or to bathe in it is: 10–15 minutes, once or twice a week, a sufficient period.

Previous studies:

– A study in 2018 examined the effect of hot water on human health, explaining that bathing in hot water helps improve blood circulation, relieve joint pain, and reduce stress. It also showed that water rich in sulfur and minerals has positive effects on skin health, and can treat some skin diseases such as eczema.

–And another study by researcher Hakmi. Alia. In the year (2011), entitled Hot springs in the Jazan region and their role in serving medical tourism, in which it was stated that hot springs in many countries of the world are an attractive factor for medical tourism, due to the presence of the natural conditions that were the reason for their formation, and the medical studies that proved their benefits.

Recent international studies (2022–2023) have confirmed that sulfur water can contribute to the treatment of skin diseases such as eczema and psoriasis through its anti-inflammatory effect, but these benefits require more clinical studies to prove its effectiveness on a large scale.

Based on previous studies, we conducted a similar study that helps improve the hypothesis that states that there is an effect of hot spring water on human health in the Jazan region

Materials and method (procedures):

Tools:

❖ GLOBE devices (GPS – thermometer – hygrometer – pen – paper – computer – water thermometer – bowl) Globe Environmental website.

❖ The questionnaire.

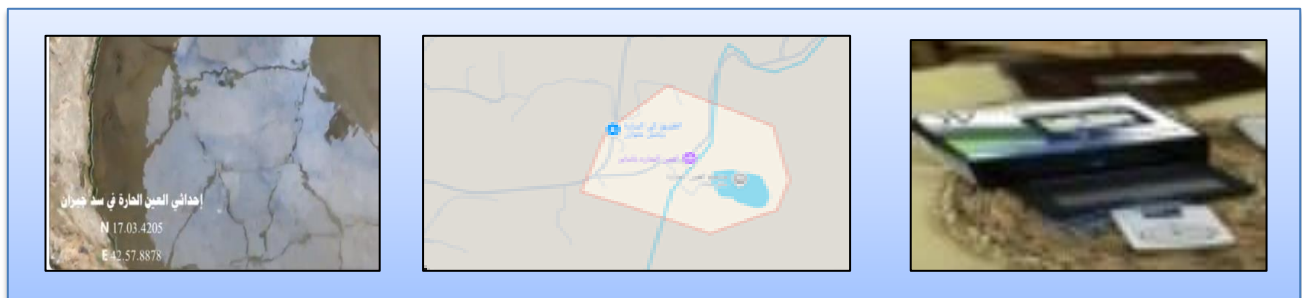
A. Preparing the study tool: The research questionnaire was constructed, and in its final form it consisted of (9) items. The questionnaire was distributed to a random sample.

B. Validity of the research tool: The researchers presented the questionnaire to a random sample to express their opinion on this test in terms of: its suitability to the research topic, its comprehensiveness, and the sufficient number of elements to enrich the research. The researchers obtained some constructive opinions and comments, in light of which they modified some of the paragraphs and approved them, so it became in its final form.

C. Stability of the research tool: The stability of the research tool (the questionnaire) was confirmed, and high stability rates were observed for all areas of the questionnaire. The research tool enjoys stable results if it is re-applied to the research sample again, which confirms its suitability for field application.

Steps: We used the descriptive survey approach and the mixed methods approach

· We used the GLOBE website and devices to take data and determine the location (Figure 1)



Tools used to determine the location (Figure 1)

- Measurements: Water temperature reaches 50–60 degrees Celsius.
- Air temperature ranges from 47 in summer to 26 in winter. pH 8
- Then we used observation while we were out and took some pictures showing different locations of hot springs in the Jazan region

Pictures showing the hot springs in the Jazan region, Figure (2 – 3 – 4)

- Then we used the questionnaire.

Show results:

Statistical methods:

To achieve the research objectives and analyze the collected data, the arithmetic average was used to determine the trends in the responses of the research sample members.

Proportions and frequencies: One of the important steps in preparing scientific research is determining the research sample. The researchers chose the sample randomly, as its number reached (60) from the study population, and a random sample of (50) was taken from it, representing (83%).

Analysis and results:

From the table and statistical graph, we note the percentage of degree of agreement in the study tool, the questionnaire

Table No. (1)

Paragraphs	Degree of agreement				Arithmetic mean	Total
Have you ever visited the hot springs in the Jazan region before?	Yes 41.9%	No 58.1%			83%	100%
I have visited the hot springs in the Jazan region before for...?	Tourism and entertainment 25%	Treatment 14.1%	Other 4.7%	I haven't visited it 56.3%	83%	100%
The best times to visit the hot springs in the Jazan region?	Summer 10.9%	Winter 46.9%	The spring 34.4%	Autumn 7.8%	83%	100%
Can hot springs be an alternative to medical treatment?	I strongly agree 25%	I agree 46.9%	Neutral 21.9%	I don't agree 6.3%	83%	100%
Do the benefits of the hot springs justify the cost and effort required to visit them?	I strongly agree 26.6%	I agree 48.4%	Neutral 12.5%	I don't agree 12.5%	83%	100%
Sulfurous water, with its antibacterial properties, helps in eliminating bacteria	I strongly agree 42.2%	I agree 48.4%	Neutral 6.3%	I don't agree 3.1%	83%	100%
Do hot spring waters help in treating skin ulcers?	I strongly agree 28.1%	I agree 50%	Neutral 17.2%	I don't agree 4.7%	83%	100%
Are hot springs both a therapeutic and tourist destination?	I strongly agree 39.1%	I agree 51.6%	Neutral 4.7%	I don't agree 4.7%	83%	100%
Do research studies help in improving and developing hot springs?	I strongly agree 48.4%	I agree 45.3%	Neutral 4.7%	I don't agree 1.6%	83%	100%

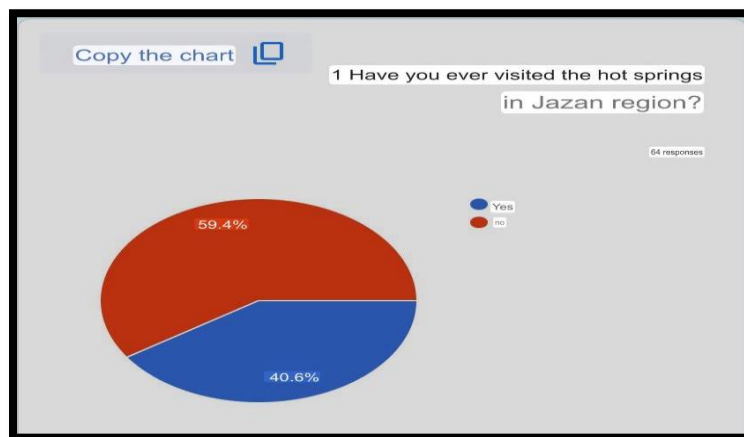
Discussion and explanation of reasons:

From the tables and graph, we conclude that:

Findings related to the study questions and their discussion as shown through graphs:

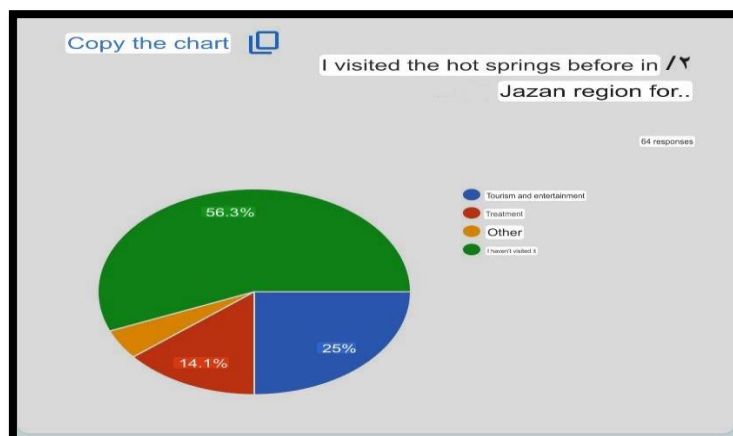
Percentage of answers behind the first paragraph: Have you ever visited the hot springs in the Jazan region?

Figure No. (1)



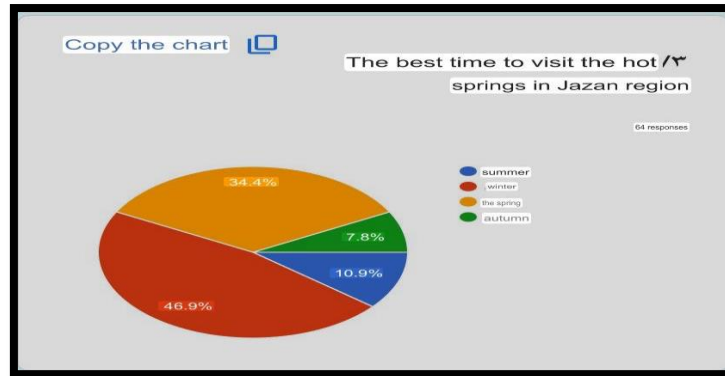
Percentage of answers and opinions for the second paragraph: I visited the hot springs before in the Jazan region for.

Figure No. (2)



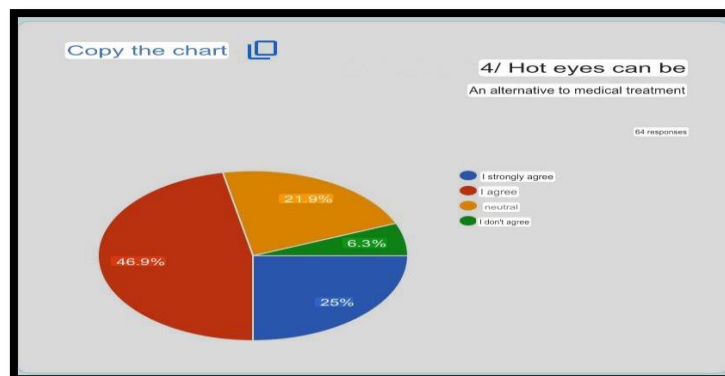
Percentage of answers and opinions for the third paragraph: The best time to visit the hot springs in the Jazan region.

Figure No. (3)



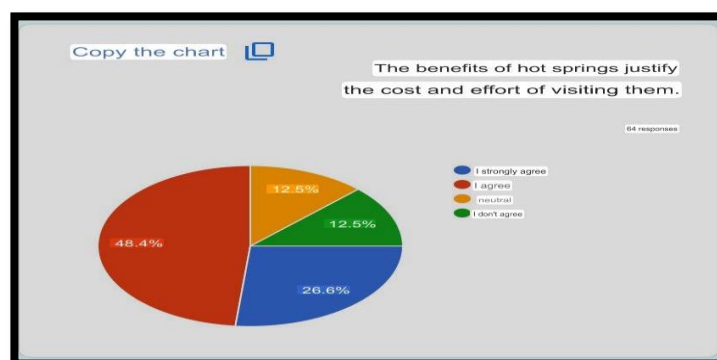
Percentage of answers and opinions for the fourth paragraph: Hot springs can be an alternative to medical treatment.

Figure No. (4)



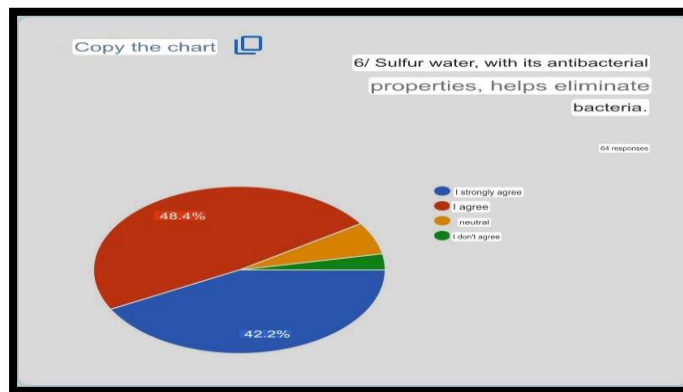
Percentage of answers and opinions for the fifth paragraph: The benefits of hot springs justify the cost and effort expended to visit them.

Figure No. (5)



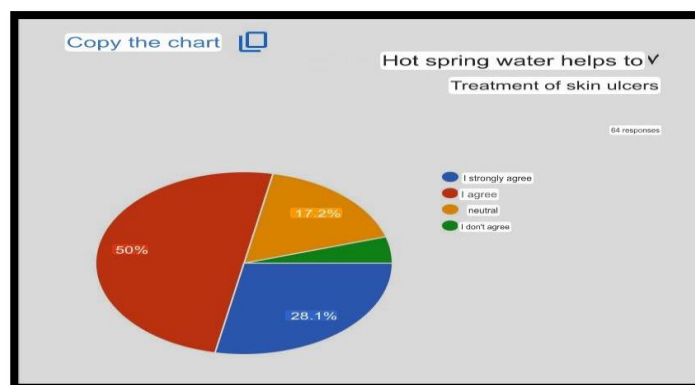
Percentage of answers and opinions for the sixth paragraph: Sulfur water, with its antibacterial properties, helps eliminate bacteria.

Figure No. (6)



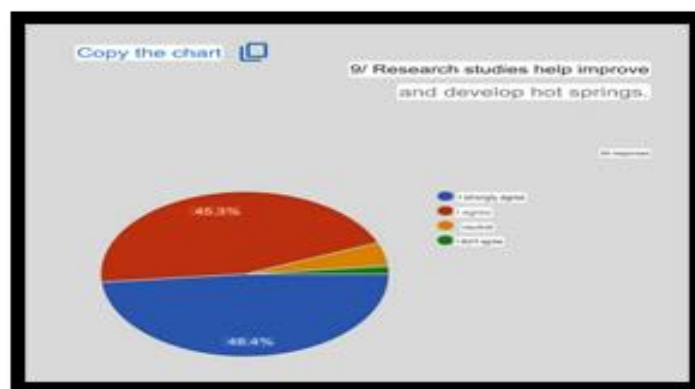
Forgetting the answers and opinions. The seventh paragraph: Hot spring water helps treat skin ulcers.

Figure No. (7)



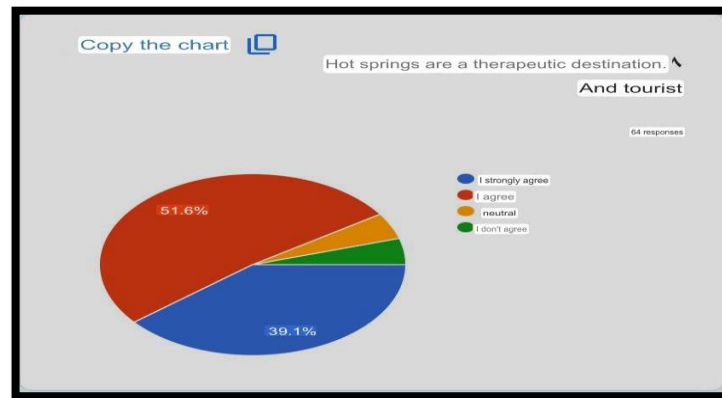
Percentage of answers and opinions for the eighth paragraph: Hot springs are a therapeutic and tourist destination.

Figure No. (8)



Percentage of answers and opinions, paragraph nine: Research studies help improve and develop hot springs.

Figure No. (9)



The results during the statistical analysis highlighted some important matters:

The percentage of agreement in all items was between (I strongly agree – I agree) and was between high and medium, and the percentage of disagreement was very weak and non-existent.

The percentage of agreement also appeared strongly that there is a relationship between hot springs and human health and it affects the increase in the number of visitors to the Jazan region and is related to tourism for treatment, entertainment and mental health.

It was found that 44% of people had previously visited the hot springs in the Jazan region for tourism and hospitalization. The most appropriate times to visit the hot springs in the Jazan region are in the winter by 46% and the spring by 34% due to the high air temperature in the summer and fall seasons. The analysis data showed that there is an inverse relationship between the temperature and the appropriate times for visiting the hot

springs and the change in weather. The higher the temperature, the fewer the number of tourists to the region.

The results also include the following:

- The effect of hot spring water on treating skin ulcers

Percentages:

27.4% of participants strongly agreed that hot spring water has a positive effect on treating skin ulcers.

51.6% agreed with the idea.

16.1% were neutral.

4.8% did not agree.

It is clear that there is great conviction among participants about the importance of hot spring water in treating skin ulcers, as more than three-quarters of the sample (79%) agree or strongly agree with the idea.

The percentage of neutrals (16.1%) may reflect a lack of sufficient knowledge or limited experience with the use of this water.

The percentage of opponents is very small (4.8%), which indicates widespread acceptance of the idea.

- Hot springs as a therapeutic and tourist destination

Percentages:

40.3% strongly agreed that hot springs can be a therapeutic and tourist destination.

51.6% agreed.

6.5% are neutral.

Only 1.6% did not agree.

Analysis: It is clear that there is great conviction among participants about the importance of hot spring water in treating skin ulcers, as more than three-quarters of the sample (79%) agree or strongly agree with the idea.

The percentage of neutrals (16.1%) may reflect a lack of sufficient knowledge or limited experience with the use of this water.

The percentage of opponents is very small (4.8%), which indicates widespread acceptance of the idea.

This indicates an almost complete consensus on the possibility of exploiting hot springs as a therapeutic and tourist destination, as the total percentage of supporters reached (91.9%).

The low percentage of neutrals and opponents (less than 10%) indicates that there is a general conviction in the importance of the therapeutic and tourism role of these natural resources.

– The role of research studies in improving and developing hot springs

Percentages:

48.4% strongly agreed on the importance of research studies in improving hot springs.

45.2% agreed.

4.8% are neutral.

Only 1.6% did not agree.

This distribution reflects high awareness among participants about the importance of scientific research in developing hot springs, as the percentage of supporters reached 93.6%.

The small number of neutrals and opponents emphasizes the importance of promoting scientific research as a basic pillar for improving natural resources and using them effectively.

Conclusion:

The results reflect great awareness and belief among participants about the importance of hot springs as natural resources, both in the therapeutic and tourism fields.

There is significant support for the importance of developing these resources through research and scientific studies.

Opposition rates are very low, indicating great opportunities to invest these resources further in the future.

Based on the observations and photos taken in the city of Jazan (Photos No. 2, 3, 4)

It is clear to us that there are three hot springs in three governorates of the Jazan region, and each spring is different from the other, but all of them are used for tourism and treatment and are distinguished by their high temperature, which reaches 50–60 degrees Celsius. People's visits to it vary from one season to another. In the summer, dust blows, the temperature rises, and its effects cause a change in the weather.

This has a major impact on the lack of tourists during this period, and the number of tourists increases in winter and spring due to the mild weather. This has a major impact on the lack of tourists during this period, and the number of tourists increases in winter and spring due to the mild weather.

Discussion and conclusions:

There are many studies proving the effect of hot spring water on human health, in agreement with our current study, but the purpose of this study is to identify its effect on human health in the Jazan region and the appropriate times to visit this region.

In this research, a group of different aspects related to this distinctive natural phenomenon were discussed, such as the health benefits, how treatment is carried out with this water, and the relationship between tourism and the atmosphere.

In light of the conclusions we have reached in this research, the **following recommendations can be made:**

- Encouraging the development of geothermal energy projects using hot springs in a sustainable manner, taking into account techniques to reduce environmental impact such as improving efficiency.
- Supporting research studies that study the effects of hot water on public health, such as treating skin, muscular, and psychological diseases.
- Focusing on community awareness of the effective role of hot springs in treatment and tourism.
- Promoting research studies to improve the use of hot springs and develop the associated infrastructure.
- Promoting Al-Ayoun Al-Hara as a therapeutic and touristic destination, both internal and external, to increase economic returns.

Difficulties:

- After the hot springs from the residential area in order to conduct many experiments.
- Lack of data in the Globe program to analyze the water chemistry of hot springs.

Acknowledgments:

We would like to extend our sincere thanks to our family who helped us, to my beloved country, to the Globe Environmental teacher, Faizah Bahri, who specializes in BA in Geography, and the teacher, Fatima Wafi, who specializes in BA in Chemistry, and the two teachers, Salima and Faiqa Mughni , who specializes in English, for translating the research, to my school that gave me support, to the supervisor of scientific activity in the Department of Education, Professor Najla Khawaji, to the Jazan University doctors who followed up on the research, and to the Globe Environmental Program for granting me supplies.

Badge:

1– The Collaborator: This research was prepared in a participatory manner in all its procedures and stages. We also cooperated with Professor Faizah Bahri, majoring in Bachelor's in Geography, for training on how to prepare the research, and the science teacher, Teacher Fatima Wafi, majoring in Chemistry. In addition to cooperation with Professor Najla Khawaji, Supervisor of Scientific Activity in the Sabya Education Department. Collaboration took place between the students, Shaima Dhahi and Ohood Jaafari In writing the research paragraphs, reading about the research topic, making and distributing the questionnaire, conducting observations and collecting data.

2– Problem solver: This research helps solve a problem and treat some diseases because of their impact on human health.

3– Community impact: Researching brief studies is a real problem that the local community suffers from, and it attempts to answer the questions to reach specific results that are expected to lead to actual solutions, and this is what we recommended at the end of this research and we aspire to. To be able to generalize the proposed solutions and results on a community-wide and then global scale to all countries that live in the same geographical conditions.

4–STEM (specializing in science, technology, engineering, and mathematics): In this research, cooperation was carried out with the professor and trainer A. Faizah Bahri, BA, specializing in Geography, for training on how to prepare research, and the teacher, Fatima Wafi, specializing in Chemistry, Dr. Abadi Muhammad Mishlawi, Assistant Professor of Entomology at Jazan University, and Dr. Osama Muhammad Hassan Aboul Gheit, Assistant Professor of Entomology at Jazan University, to review the research.

5– STEM Storytellers:

We shared our experience with many of our colleagues at the school level, in addition to creating a questionnaire and publishing it on social media to reach the largest possible segment of society to know their opinions.

6– Data scientist: To answer the research questions, we relied entirely on the data we collected, analyzing it, comparing it, then drawing conclusions from it, and finally coming up with results that can be generalized, as well as future development and recommendations.

the reviewer :

- Dictionary of meanings.
- Benefits of hot springs <https://mawdoo3.com/>
- Deanship of Postgraduate Studies – King Abdulaziz University. -
https://www.kau.edu.sa/Show_Res.aspx?Site_ID=306&LNG=AR&RN=59295
- Globe Environmental Virtual Exhibition
https://www.globe.gov/news-events/meetings_symposia/annual-meetings/23rd-annual-meeting

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