The Impact of Microbial Water Pollution on Human Health

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Abstract

The study aims to know what type of pollution exists in water, and what types of microbes cause water pollution. The questionnaire was created electronically via Google Drive, and then distributed via mobile phone on the social media program (WhatsApp). The data was collected through the researcher's e-mail through the participants' responses to the questionnaire questions. 600 questionnaires were distributed to residents of the city of Mecca, aged 25-55 years, and 580 questionnaires were received on the researcher's e-mail. It concluded that according to the participants' opinion, we advise against throwing these mentioned materials into the water.

Keywords: the impact, of microbial, water pollution, on human health.

1. Introduction

water pollution is any physical or chemical change in the quality of water, directly or indirectly, that negatively affects living organisms, or makes the water unsuitable for the requested uses (1). Water pollution has a major impact on the life of the individual, the family, and society. Water is a vital requirement for humans and other living creatures. Water may be a major reason for ending life on Earth if it is polluted (2). Water contamination is divided into two main types. The first is natural pollution, which appears in a change in water temperature, an increase in its salinity, or an increase in suspended materials. The other type is chemical impure, and its forms are numerous, such as wastewater pollution, oil spills, and agricultural waste pollution such as pesticides and agricultural fertilizers. Water pollution takes different forms and has different repercussions, and thus there are many concepts of water pollution. It can be defined as causing damage or corruption to the quality of water, leading to a disruption in its ecosystem, which reduces its ability to perform its natural role and makes it harmful when used, or causes it to lose

much of its economic value, especially with regard to its fish resources and other aquatic organisms (3). Water infection is also known as the desecration of rivers, oceans, and lakes, in addition to rainwater, wells, and groundwater, making their water untreated and unusable, whether for humans, animals, plants, or other aquatic organisms (4).

Water is considered a vital element within the ecosystem, and it represents an essential link in food chains. However, this component, despite its abundance, suffers from pollution pressures coming from several sources, most notably industrial, domestic, and agricultural wastes, and wastewater treatment in rural areas often poses a problem. Large, because this water coming from rural communities requires integrated treatment and monitoring so that it can be regularly discharged into the marine and coastal environment without tangible environmental damage. Wastewater contains a large and diverse group of microorganisms, some of which cause several serious diseases to humans, animals, and plants, while most of them are harmless, they can be beneficial and serve as an important and effective tool for water purification (5,6), According to the World Health Organization, water-borne diseases, such as cholera, typhoid, and hepatitis, are responsible for about two million deaths annually in some rural areas of Third World countries, the majority of them among children under the age of five. Accordingly, biological and physico-chemical treatment is considered to improve the health quality of water. Sanitation is extremely important in these places. In Mediterranean countries, the percentage of the population enjoying the municipal sewage system is high, while many villages are still not equipped with sewage treatment plants, as the cost of installing them increases significantly as the population density increases (7). Discharging a large amount of treated or untreated wastewater into marine environments, especially coastal environments, on the one hand. Water-borne diseases are diseases that are transmitted to humans or animals through water, which usually contain a percentage of disease-causing microorganisms. The latter is transmitted directly when fresh water is contaminated and a person or organism, in general, uses it for drinking or bathing. It also causes the same diseases when it is used in preparing food (8)(9)(10). According to the World Health Organization, 1.4% of people who have or are suffering from diarrhea are caused by contaminated water. According to the same organization, polluted water (especially groundwater) causes the death of 1.8 million people every year. It is estimated that 88% of these problems are due to the mixing of wastewater with pure or fresh groundwater, leading to its contamination and the presence of organisms that may cause serious diseases.

2. Material and Methods:

The study started in (the holy city of Mecca in Saudi Arabia), began writing the research and then recording the questionnaire in January 2024, and the study ended with data collection in August 2024 The researcher used the descriptive analytical approach that uses a quantitative or qualitative description of the social phenomenon (the impact of microbial water pollution on human health). The independent variable (percentage of microbial contamination present in lake water) and the dependent variable (percentage of microbial contamination present in mineral water) This kind of study is characterized by analysis, reason, objectivity, and reality, as it is concerned with individuals and societies, as it studies the variables and their effects on the health of the individual, society, and consumer, the spread of diseases and their relationship to

demographic variables such as age, gender, nationality, and marital status. Status, occupation (11), And use the Excel 2010 Office suite histogram to arrange the results using (12). A questionnaire is a remarkable and helpful tool for collecting a huge amount of data, however. answered the questionnaire electronically, the questionnaire consisted of eleventh questions, all of which were closed.

3. Results:

The percentage of participants responding to the research questionnaire was 100%. Regarding the age of the research participants, we find the following: from the ages of 25-34 years, their percentage was 28.4%, from the ages of 35-44 years, their percentage was 51.6%, and from the ages of 45-54 years, their percentage was 13.7%, from 55-60 years old, and their percentage was 6.3%. Regarding the gender of the research participants: Saudis, their percentage was 64.2%, and non-Saudis, their percentage was 3.2%. As for their educational status, the percentage of holders of a high school diploma was 21.9%, holders of a university degree were 51%, holders of a master's degree were 27.1%, and holders of a doctorate were 0%.Regarding the first question: Do you feel that water pollution is the primary cause of the spread of serious diseases? The answer was as follows: Yes 90.5%, No 9.5%. As for the second question: Are diarrhea, cholera, hepatitis, and typhoid among the causes of water pollution? The answer was yes 97.9%, no 2.1%. The third question: Does the use of pesticides and chemical fertilizers cause water pollution? Yes 91.7%, No 8.3%. The fourth question: does microbial contamination of water cause the spread of salmonella and hepatitis in a number of countries around the world? Participants answered yes 92.7%, no 7.3%. The fifth question: Can water pollution with chemicals be dangerous to the environment and human health? All responses were 100% yes. The sixth question: do sewage, agricultural fertilizers, and factory waste cause water pollution? The answer was yes 97.9%, no 201%. As for the seventh question: Is pollution with petroleum materials a danger to water and human health? Yes 98.9%, No 1.1%. The eighth question was about: Is discharging waste into water stations a cause of water pollution? The answer was yes by 95.8%, and no by 4.2%. Question 9: Is the use of anti-pollution devices in factories a solution to water pollution? Yes 94.7%, No 5.3%. The tenth question was about: Does reducing the use of pesticides, chemicals, and throwing waste contribute to reducing water pollution? The answer was yes 95.8%, no 4.2%. The eleventh question: Is stagnant water considered a source of water pollution? The answers were as follows: 97.7%, no 2.3%. As for the last question: Is rust in water one of the causes of water pollution? the answers were yes by 96.8%, no by 3.2%. (figure No.1).

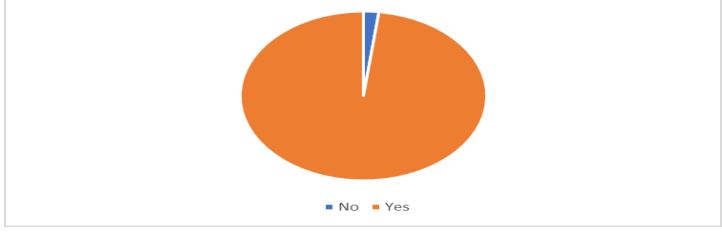

Figure No.1: The impact of microbial water pollution on human health according to partciptes

4. Conclusion:

Water pollution with chemicals is considered a threat to the environment and causes water pollution at a very high rate, according to the opinion of the participants in the research questionnaire 100%. Pollution with petroleum materials causes water pollution by 98.9%, due to the presence of microbes present in petroleum. Waste also leads to water pollution by 95.8%. Pesticides and dumping waste in water also lead to water pollution. 95.8% of all these materials. Wastewater, agricultural fertilizers, and factory waste also lead to water pollution at a very high rate 97.9%, so according to the participants' opinion, we advise against throwing these mentioned materials into the water.

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