Chemistry In Health Care, Climate Change And Environment Protection

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In the past few decades, innovative chemistry products have played a significant role in improving humanity's quality of life and have made tremendous efforts to preserve the environment. The chemical industry, therefore, is continuously changing and progressing in terms of innovative technologies and is responsible for playing a fundamental role in sustaining the environment and also in maintaining the quality of humanity's life on a global scale. The industry is associated with environmental protection, global healthcare and safety, industrial processes, renewable energy resources, and energy efficiency due to scientific advances in chemistry. Contrary to the advantages, the chemical industry brings numerous unavoidable widespread environmental issues such as environmental pollution, global warming, depletion of natural resources, and greenhouse gas emissions due to technological advances. These concerns are associated with the manufacturing, improving, and maintaining products and chemical processes. All these issues related to chemistry regarding environmental pollution and healthcare systems should be surmounted to meet the environmental, social, and economic needs of society (Shakhashiri & Bell, 2014). Therefore, to address far-reaching concerns of the environment and health care, Green Chemistry has emerged in modern science as a rapidly advancing trend that focuses on the environmentally sustainable and energy-efficient implementation of chemical technologies and services. Sustainable Green Chemistry provides an avenue for improving human health, enhancing sustainability, advancing the human condition, and driving the economy to meet market demands in the wider community. This approach starts with the concept of design and innovation in chemical processes and products to mitigate the global environmental crisis. The paper explores the significance of chemistry in health care, climate change, and environmental protection, which can be achieved through the advancement of Green Chemistry in the contemporary world.

Chemistry in Health Care

Chemistry has majorly contributed to the field of healthcare and medicine through the development of new drugs produced by chemists and chemical engineers. A sound and basic knowledge of chemistry is essential for meeting the needs of healthcare professionals to enable them to deliver the best possible and safe care, reducing the risks of hazardous chemicals. It is vital for doctors and care providers to have knowledge and understanding of the different medications and procedures that involve chemical substances that are being administered to certain patients of different diseases. Healthcare providers use organic chemistry to understand the processes in human beings that take place at the cellular level to help improve the basic research methods in healthcare (Martens & McMichael, 2009). Care providers, through the use of organic chemistry, need to understand the

mechanisms underlying diseases and determine the treatments for the patients. Chemical science, in collaboration with organic chemistry, helps chemists, doctors, and care providers through the development of improvised means of diagnosis. Chemistry also sets the basis for optimizing the development of effective drugs and their usage for the treatment of different chronic diseases.

Chemistry is very important in various aspects of healthcare, including medicine, because many illnesses require treatments in which doctors, care providers, and pharmacists need to understand the composition and properties of a certain medication. This could only be possible if a pharmacist has a good understanding of chemistry so that he can discover the chemical properties of the medicine and how the solution should be made along with other medicines to treat the disease. However, it should be understood that chemistry cannot prevent death but only the potential health risks that lead to the possibility of death due to certain serious illnesses such as cervical cancer, tuberculosis, colorectal cancer, etc. Chemistry through medicines not only helps restore good health but also contributes to other aspects of life, such as good nutrition to help avoid the risk of diseases. It is important in healthcare and the field of medicine in particular because a patient should be provided with a safe and effective drug to treat diseases and injuries through chemicals and chemical processes and bring the patient back to full health (Shakhashiri & Bell, 2014).

Nowadays, many of the changes in the healthcare sector we observe are due to chemical reactions that involve advances in the field of chemistry. In the field of healthcare, chemistry plays a very significant role, as we see diagnostic tests being performed in the laboratory to identify the actual location of a problem in the human body and medical prescriptions being provided for diseases, including vaccines, pills, antibiotics, and solutions in the form of injections. It plays a critical role in health monitoring from birth control to the enhancement of life expectancy in dangerous situations. All of these services are made possible in the field of healthcare due to the unequivocal services of chemistry. By understanding chemistry and its significance in the healthcare field, care providers would be able to develop drugs that fight illnesses, develop good nutritional choices, and create healthier environments to avoid the risk of dangerous diseases that can cost the life of a person. So, it is vital to understand how supplements, drugs, and multivitamins can harm or help a person fighting a certain disease. It is beyond imagination how healthcare and the field of medicine would develop without chemistry, as it is a necessary part of care and nutrition.

Chemistry and Environment Protection

Chemistry is essential to understand, improve, protect, and monitor the environment in order to meet the basic needs of human beings in society, such as clothing, health, food, shelter, and energy. It enriches the quality of life by developing tools and techniques in numerous ways to make sure that humans are provided with new and novel solutions to the problems and far-reaching life concerns in the environment, climate change, and health. Environmental Chemistry, in this regard, studies the effects of human activities, biochemical processes, and various chemicals on the environment. Chemists and chemical engineers, through the applications of environmental chemistry, contribute to

the environment in a variety of ways by posing investigations on the consequences of changes that occur in any climate, understanding atmospheric chemistry, diving deep into oceanic chemistry, developing new solutions to mitigate negative impacts of carbon and energy, and also by helping products such as crops to tolerate the conditions of climate change (Ali & Khan, 2017). Because of the existence of chemistry in human society, people are able to be provided with home appliances, technology such as computers, fabrics for clothes, compounds of personal care products, and more advanced medicines. Thus, society has greatly benefited from the field of chemistry.

However, the place of chemistry in the environment is still questionable because of the production, use, and release of certain harmful effects of chemicals on the environment. Chemistry has potentially harmed the environment through the chemicals that have the potential to cause harm, even though they were created to improve the quality of human lives (Organization, 2003). The role of chemistry is mainly trial and error in the environment because of certain social risks associated with the fear of knowing the reactions of different chemical substances in the manufacturing of drugs, explosives, nuclear products, and other lethal things. Moreover, the environment is harmed by the consequences of the chemical industry and chemistry because of the emissions of greenhouse gases in the atmosphere that subsequently result in the decrease of biodiversity, water pollution, and the greenhouse effect. All these impacts are consistent and ever-emerging due to the growing effects of chemistry and its activities in human society. As chemists and chemical engineers venture into chemical substances, the lesser-known chemical elements create a devastating impact on society's and humanity's health (Schlesinger et al., 2007). Since the dawn of humanity, man has used the field of chemistry to his own advantage for manufacturing and using things such as making fire, explosives, things that aid hunting, etc., that have had a lasting impact on human society.

The Impacts of Chemistry on Climate Issues

Human activities have a definite impact on the climate of any region. In this context, climate change is one of mankind's biggest concerns. The emission of certain substances into the atmosphere leads to global warming and the greenhouse effect that is associated with human activities. Gases that contribute to global warming and the greenhouse effect include chlorofluorocarbons, sulphur dioxide, carbon dioxide, carbon monoxide, and nitrogen oxides. All these emissions are due to some natural causes as well as human activities, including energy generation, industrial activities, transport, and agricultural activities, which make pollution in the atmosphere significantly higher. The trivial solution to climate issues is, therefore, the reduction of the emission of gases into the atmosphere. Thus, chemistry is essential for making more efficient industrial and technological activities through fewer resources and the implementation of chemical processes for energy consumption. Through advances in chemistry, chemical formulations such as the emissions of non-methane volatile organic compounds (NMVOCs) have decreased considerably over the past two decades (McMichael et al., 2003). The field of chemistry has developed new chemical materials with less energy and fuel consumption through the improvised performance of chemical formulations.

Regarding new renewable energy and fuel resources, biofuel is the best option to mitigate the impacts of fossil fuels on the climate. Biofuel also releases carbon dioxide but originates from a natural source that balances the level of carbon dioxide in the atmosphere. Moreover, chemistry has an important role in determining and predicting the state of the earth's climate. Chemical agents and processes in the atmosphere force the course of the earth's climate through properties and abundances of atmospheric forcing agents, which can be reversed through alternative green energy sources like solar, wind, or tidal energy. Avoiding deforestation or cutting forests and green plants will also be an effective answer to climate issues because green plants use carbon dioxide from the environment and use it in the making process called photosynthesis. So, carbon dioxide can be considered as a potential raw material to create organic molecules through plants and the construction of compounds through the reactions of carbon dioxide with certain mineral compounds and materials of application in daily life. These new approaches would help the environment decrease the emission of greenhouse gases into the atmosphere, improving the state of the climate (Patz et al., 2000).

Undoubtedly, the field of chemistry has the potential to control the harmful effects of chemicals, greenhouse gases, and other dangerous compounds that are a potential risk to the climate. It provides all the effective answers and solutions to the climate by reducing the levels of carbon dioxide and limiting the emissions of greenhouse gases in the atmosphere while involving the energy of the Sun with other green energy sources such as wind and tidal energy. However, chemistry alone cannot achieve this goal only through the services of chemistry scientists and engineers; the combined efforts of our societies are needed to foster the implementation of the goals and objectives of chemistry in the environment to mitigate dire climate issues. Chemists develop new technologies through the use of the field of chemistry to save critical ecosystems, protect necessities of life such as food and water, and safeguard societies from natural disasters in the face of global climate issues. Climate change is frightening for the earth and its inhabitants, but chemistry offers potential solutions that play a critical role in helping the world thrive.

Importance of Green Chemistry in Healthcare, Environment Protection, and Climate Change

Green chemistry, a branch of chemistry that takes its lead from nature, provides promising solutions to all the issues related to climate and the environment. This branch aims to design chemical processes and manufacture chemical products in a way that would eliminate the dire impacts of chemical formulations from the environment and reduce the generation of hazardous substances and compounds affecting the climate all over the globe. The application of green chemistry in the environment creates safer and better end results through the understanding of chemicals and their effects on the environment, climate change, and other related fields as a revolutionary way to improve the environment. Green chemistry also ensures the manufacturing and usage of chemical processes and substances that are not detrimental to the environment and the global climate by

providing all the qualities of technological innovation that meet modern life trends. It is a fundamental approach responsible for mitigating different environmental issues by shaping a sustainable and innovative growth model for the environment (Wardencki et al., 2005). Therefore, the environment needs green chemistry, so eco-friendly methods can be adopted to improve chemical synthesis in the future.

In the field of healthcare, Green Chemistry refers to rethinking the composition of medicines or other chemical products, such as vaccines, as they are the only products used in the chemistry care field. It ensures that the effects of hazardous substances must be reduced so that healthcare providers and pharmacists can promote sustainability in the field of medicine. The branch is concerned with eliminating the generation of hazardous substances in the making of medications that can end up in a final, safe, sustainable, effective, and better product. It ensures the elimination of persistent hazardous substances that can enter the food chain and potentially harm the consumers of the food products. Furthermore, the discipline emphasizes the use of pesticides for agriculture that are toxic only to specific pests, not humans or animals, and that should have the ability to degrade after use so that the products would be safe. As it is a new advancement in the field of chemistry, healthcare providers should encourage the global healthcare sector to promote sustainable products and practices of Green chemistry. Healthcare providers all over the globe can encourage organizations to promote and advocate the practices and products of the discipline in healthcare facilities (Nameroff et al., 2004). The conclusive goal of Green Chemistry in healthcare is to stop the contaminants that are polluting the environment and thus risking human lives entirely. Chemists do understand that although it is not the full-fledged package to serve the healthcare sector and other arenas of life, it is a helpful solution in producing non-hazardous or non-toxic chemicals to protect the environment and the people inhabiting it.

Green Chemistry is referred to as the environmentally benign discipline of chemistry that aims to offer cost-effective yet high-performing technology that is safer and sustainable for human health and the environment. It plays its role in maximizing the desired products and minimizing the risks that are related to the formation of harmful bioproducts in an environmentally friendly way. Pollution is a major concern to the environment. Green Chemistry attempts to control and mitigate its harmful effects so that the waste products would be minimal in the environment, and disposal should be convenient to make the environment clean, safe, and sound for humanity. The toxic substances in the environment cause serious harm to aquatic and territorial life due to gases dissolved in ocean water and other water bodies, such as nitrogen oxide, sulphur dioxide, and carbon dioxide, which cause acidification in the water. Thus, Green Chemistry aims to eliminate harmful bio-products from the environment to control the ocean and environmental pollution (Wilson & Schwarzman, 2009). It reduces the number of hazardous substances that affect public health and the environment by adopting recycling and disposal strategies. Green Chemistry opts for improvements in designing, reformulating, and modifying the products to reduce the hazards associated with contaminants and pollutants.

In a nutshell, Green Chemistry works on the principle that chemical manufacturing needs to change

for the environment's betterment. It is an exciting discipline in the field of chemistry that can revolutionize healthcare, the environment, the climate, and the global village as a whole by giving humans access to cleaner, safer, sustainable, and effective chemical products. Healthcare is a significant area of Green Chemistry because of the novel implications in the field of medicine, and it is also an important area of research worldwide. The world needs creative, innovative, sustainable, and safe inventions and implications to protect the environment and humanity. Green Chemistry is an effective answer to this, as it helps build a safer and more sustainable future by conserving energy, reducing waste, and discovering creative and innovative replacements for toxic substances present in the environment (Wilson & Schwarzman, 2009). This would help the global village with the contributions of environmentalists, chemists, and all the professionals from different fields of life to design Earth as an efficient planet where all living creatures can co-depend to benefit each other in an effective, innovative, and safe way.

Conclusion

Chemistry has drastically improved the standards of human life on Earth. It is a central science with various other intersections of related disciplines that permeate all of our lives and activities. This branch of science helps humanity solve many future problems, including the protection of the environment, mitigation of climate issues, promotion of better human health, proper management of food production, and everything around us. Without chemistry in life, environment, climate, healthcare, and other fields, human life would be short, dark, boring, and without any facilities. If it were not for chemistry, people would die at a younger age because of fewer or no facilities to diagnose and treat dangerous diseases such as Bubonic Plague, Coronavirus, and other viral pandemics since the world would not have antibiotics and vaccines. We could not even breathe without the application of chemistry because the process of breathing is a complex chemical reaction in itself. Thus, chemistry affects all aspects of life because all living or non-living things are made up of matter, and the field deals with the composition, structure, and properties of matter that surround us. Above all, the human body is also made up of chemicals, so the significance of chemistry in life is that it studies everything that exists in this world. In a nutshell, chemistry is a vital field of science that gives knowledge about the diagnosis of diseases, understanding of the environment, mitigation of climate issues, and providing effective care to every individual in society. Moreover, Green Chemistry has emerged as a key path to a sustainable, innovative, and safe future if the chemists invent better technologies and understand the underlying functions of chemistry to face the challenges that the harmful effects of chemical formulations pose to the environment, climate, and the earth.

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