

Sustainability in health and health care provision

I. INTRODUCTION

The world is moving at a very fast pace and we can see the development and growth in all aspects. These developments come with their own consequences. With the increase in population, there is increase in consumption of food items as well as increase in waste generation. The earth is deeply affected by this growth and development. Utilization of natural resources is leading to its depletion. Waste generation from all areas is leading to environmental pollution. The increasing rise of temperature in the earth is one of the results of environmental pollution. The increase in development can be deeply felt by all creatures on earth.

Thus, people have started to realise the importance of maintaining the earth and preparing for the future. Some people have started to realise the importance of a green earth. We can now see many eco-friendly products. The Global Recycling day was initiated in the year 2018 with the objective to reduce carbon emission and save the planet earth [1]. Many Governments have introduced laws to combat pollution. Individual inventors started converting waste materials into usable items. Carmen Hijosa, the founder of a company Ananas Anam in Philippines, developed a method to convert pineapple leaves into a fabric known as pina. This is used as a substitute for leather and thread [2]. Environmental friendly methods have replaced the traditional methods. Replacing traditional light bulbs with LED bulbs is one such example. This led to the development of the term sustainable. Though this concept has been understood since the 17th century, it has never been widely used as in the present days. Living in harmony with nature and within the society is a necessity and not a choice that one wishes to avoid.

II. DEFINITION AND CONCEPT

The United Nations World Commission on Environment and development, in 1987 published a report 'Our Common Future'. This was known as the Brundtland Report. The Brundtland Report defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs [3]. This definition is now widely used to define sustainable development. Thus we can say that sustainable development is the utilization of the resources for the requirements of the present generation while finding the middle ground to maintain the resources for the future generation.

The concept of sustainable development developed in the 17th and 18th century when people understood the importance of forest and the need to conserve it. Writers, philosophers, scientist, artist and many others brought attention to the loss of environment through their publications and works in their respective fields. With the advent of time, the focus shifted from environmental conservation to social as well as economic conservation.

With the ending of the term of the Millennium Development Goals in December, 2015, the United Nations, General Assembly adopted the Sustainable Development Goals. These goals are a call to all the countries of the world to work together for a green planet [4]. All the goals are interconnected and should be achieved by 2030. It encompasses all aspects of development and leaves no one behind. For example goal number 6 is 'clean water and sanitation'. If this goal is achieved, the goal number 3 'good health and well being' will automatically be realised.

The United Nations adopted the word 'sustainable' for a reason. The Webster Dictionary defines sustainability as "lifestyle involving the use of sustainable methods" or "a method of harvesting or using a resource so that the resource is not depleted or permanently damaged" [5]. This is a principle where the present generation's needs are met without compromising the needs of the future. The Nations are to find a balance between development and well being and protection of the environment. It is co-existence of humans and the creation.

Sustainability has three dimensions viz. social, economic and environmental.

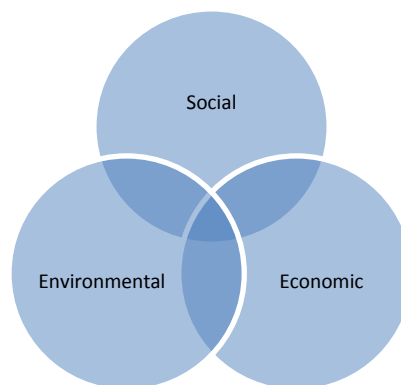


Fig 1: Dimensions of Sustainability

The three dimensions are also known as the pillars of sustainability. The idea is to that there should be a balance between the three dimensions.

Environmental sustainability means living in harmony with nature by protecting the environment from overuse. People have just started realising the importance of harmony with nature and hence have started planting more trees and maintaining a green earth by reducing waste generation. But this accounts for a very small percentage in respect with the destruction of the environment from human activities. Activities such as saving water, using renewable sources of energy, recycling etc. should be encouraged.

Equal work for all, equal wealth for all will lead to economic sustainability. Resources should be distributed equally among all without any discrimination of sex, colour or creed. But this is yet to be achieved. There is an increase rise in ethnic clashes in the present day as evidenced from news reports we can see daily. This has led to some groups abusing their power and discriminating the

other smaller groups. This will only lead to instability in the economy of the world. If this continues sustainability in economy is far from our reach.

Social sustainability can be achieved only by gender equality, development of the culture of each community, integrating traditional knowledge and scientific knowledge etc. Basic needs i.e. food, clothing and shelter needs to be met to maintain social sustainability. Democracy is a must to the people. They should be able to live freely and exercise their rights to freedom.

III. NEED

Sustainability is not a new concept but an old one which is gaining recognition in the present days. Let us further discuss a few points why there is a need for sustainable development.

- a. **Overexploitation of natural resources:** Most of the animals are becoming extinct due to the decline in forest area. There is a 60% decline in the marine fisheries. 1 million species are in the verge of extinction [6]. The natural reservation of resources is slowly depleting. The main cause is population explosion. The United Nations Population Fund (UNFPA) in the State of World Population Report states that the world population have reached 8 billion as of November 2022. [7] With the increase in population, the demand for basic needs such as fooding, clothing and shelter increases. These basic needs come from the natural reserves such as forest, water, land, etc. These basic needs are the rights of an individual and needs to be met. But meeting these needs for everyone is beyond the ability of the environment to provide. Hence leading to overexploitation of natural resources.
- b. **Scarcity of resources:** Due to population explosion, natural resources are being consumed at an accelerated rate. There is a lack of access to clean usable water in more than half of the world's population. Many countries face this problem. Water is unavailable to fulfil the demands of the population and if available, it is unusable. Water is not the only commodity that is in shortage. Food production is not adequate as per the requirement of the people. "Global food security is at crossroads as rice shortages and surging prices hit the most vulnerable" is the news headline of the Economic Times in August [8]. This is a global issue affecting all countries especially the under developed and developing countries. There is price rise in the essential commodities due to difference in the demand and supply chain. This affects especially the middle class and low income families making them unable to cope with the rising price rise and lifestyle and dwell in poverty. It is not only water and food that is scarce. Many natural resources are inadequate to meet the growing needs of the population.
- c. **Climate change:** The effects of climate change can be seen in the rise of atmospheric temperature, occurrence of severe storms, increased in occurrence of drought, warming rising ocean and so on. The Polar Regions are melting at an alarming rate due to the increase in the earth's atmospheric temperature. Thus, there is a rise in the sea level from all the melting waters flowing to the rivers. This is a threat to small islands and is one of the main causes of floods. The change in climate led to the occurrence of heavy to very heavy rainfall in certain areas whereas some regions experience severe drought. There is inadequate rainfall in many places leading to scarcity of water. This in turn led to decrease production of crops resulting in food deficit. There is also loss of species life due to climate change. Some animals including human beings are able to relocate to different places but some are not able to do so and hence may die in the process leading to loss of species. Natural disasters such as floods, forest fires, landslides, etc. may also lead to extinction of species. The change in the climate affects the health of people leading to the development of new diseases caused by different strains of viruses and bacteria. The health care system is not able to keep up with the increasing demand for health care facilities during natural disasters and the aftermath.

These are some of the main reasons why there is a need for sustainable development. Climatic conditions affect the health and overall well being of the entire population. It may lead to scarcity of resources and overexploitation of natural resources.

IV. SUSTAINABLE HEALTH CARE

Health is a necessary state for all the people living on the earth. It is important not only for the wealthy but for the poor as well, not only for the uneducated but for the educated too. Providing health care is a right of every living creature. 'Health for all' was the theme of the World Health Organization on its 75th birthday. Providing the best health care facilities to people that they may live a healthy (physical, mental and social) life without discrimination is the goal of the organization. But the health for all comes with certain effects to the environment because it is the health sector that contributes a huge amount of waste which has a huge impact on the environment. A study by Klangsin & Harding showed that medical waste is one of the top sources of air, water and soil pollution and is a major factor affecting disease spread. [9] The hospital generates different types of waste right from the least harmful biodegradable waste to the most dangerous or hazardous waste. We can say that, it is in fact the measures to bring health, which affects the health of the people.

Climate change is a hot discussion of today's news and even in the social media; we can see the discussions of various sectors regarding this topic. Climate change affects the creation of God. We can feel the rise in temperature in our daily lives. The Hindustan Times in a report by Tannu Jain reported that "The June-July-August season — summer in Northern Hemisphere — was warmest ever recorded, with average temperature of 16.77°C, which was above 1990-2020 average...the year 2023 is on track to go down in history as the hottest ever after data released on Wednesday showed that the planet sweltered under its hottest summer, as the climate crisis and an emerging El Nino pushed up temperatures, triggering extreme weather across regions" [10]. None were spared from the fury of the El Nino. Dhaka, the capital of our neighbouring country, Bangladesh saw the maximum temperature rise to 40.4 degrees Celsius on Saturday, making it the hottest day in 58 years as reported in India Today [11]. Worldwide, in the July report of the National Snow and Ice Data Centre, we can see the decline in the area of the ice covered Polar Regions, the alarming rate at which snow and ice is melting [12]. All these have an adverse effect on the health of the people. People suffer from heat stroke and heat syncope due to the rise in temperature. Children and older adults are more at risk as they are vulnerable to changes. Respiratory diseases can be seen to be more prevalent than usual. This may be due to the change in climatic conditions or may be due to the mutation of the virus causing these diseases. Thus we can say that climate change brought about by emission of pollution from the

health care sector attacks the very objective of health care sector in bringing health to all. Thus, a multidisciplinary approach is required to address the various aspects of sustainability in health care.

The Centre for Sustainable health care is a registered charity founded by Rachel Stancliffe and Muir Gray in 2008 to achieve net zero carbon and create awareness regarding sustainability in healthcare. The members include healthcare professionals, environmentalist and sustainability experts. They come together to develop ways and means for sustainability. Different projects and programmes are available to educate the people and improve the environment [13]. This is one such example where the health care sector has started to realise the importance of sustainability and its impact in the environment. Many hospitals have started using renewable sources of energy for functioning of the hospitals.

Health is also a factor that shows the progress of a nation towards sustainable development. In India, the NITI AAYOG developed the Index for Sustainable Development Goals (SDGs) to analyse the progress of the states and Union Territories in achieving the goals. It was first launched in December 2018 in collaboration with the United Nations [14]. This instrument shows where the state or Union Territory is standing with respect to its goal achievement. Healthcare is one industry that is rapidly growing and contributes towards the growth of the nation to a sustainable development. Hence realising the goals of a sustainable health care will lead to achieving the goals for the entire nation.

We can define sustainability in health care as the best quality health care delivered to the people at a minimal cost which is affordable to them and with very less impact on the environment. The needs of the present are met without affecting the futuristic needs. We can say that sustainability is the ability to continue delivery of quality services over a long period of time [15]. Health care is provided to the people at an affordable rate and everyone from the poorest to the richest are able to afford it. The resources are not affected by this delivery of health care services to the present generation but the future generation are also able to enjoy these resources when the time comes. Fisher, in an article showed that in spite of the different ways to define sustainable healthcare systems, and regardless of whether the three-pillar model or the integrated understanding of sustainability is applied, all approaches seem to have in common that a comprehensive approach with a long-term focus and a need to balance economic, social, and ecological interests needs to be used in the discussion of sustainable healthcare systems [16].

V. APPROACHES

Sustainable development can be achieved only if we work together. The different departments need to understand that they all play a part in maintaining a sustainable world. It is multidisciplinary approach. The following are some of the approaches that may be adopted to bring sustainability in health care.

- a. **Sustainable prevention:** With the change in the lifestyle of people and the improved healthcare facilities, the pattern of diseases has changes. We can see the shift from communicable diseases to non-communicable diseases. People are suffering more from NCDs. We can also see the trend of these diseases appearing in people as young as 30 years. These diseases can be prevented if we focus on primordial prevention. Primordial prevention will help to reduce the waste generation from hospitals as well as factories manufacturing the drugs and other medical equipments. Leading a healthy lifestyle simply by eating healthy food, exercise, adequate sleep and rest can bring sustainability in health care. It will also reduce the waste generated from laboratories. Since all the people are healthy, there is no need for hospitalization. Hence resources such as water, light, etc. will not be required and hence can be stored for future use. Waste generation from hospitals and clinics will also be reduced.
- b. **Sustainable diagnosis and treatment:** Treating diseases at an early stage is another step of a sustainable health care. Requirement of resources will be at a minimal since the disease is at an early stage. Early diagnosis and treatment is a must. The lives of the people will be more comfortable and secure if they can recover without any complications. Rehabilitation equipments will not be required. People can live a life that is more comfortable and with healthy prognosis.
- c. **Sustainable practice:** We all know that hospitals generate a large amount of waste. Examples include expired medicines, expired surgical items, bio medical waste like surgical dressing, cotton, single use disposable item such as syringe, etc. Most of the waste is disposed by incineration and some by burying and some by other methods of disposal. To maintain sustainability, we need to educate the workers regarding minimization of waste. Unnecessary usage of cotton, gauze, etc. proper indent of drugs and medical items will help to minimize waste. Proper disposal method of waste generated is also very important. Waste should not be dump carelessly without treating them to avoid further destruction to the earth and its living beings.

Reduce, reuse and recycle should be one of the goal and objective of health care. If possible, reuse the items but care should be taken to ensure that it does not compromise the health of the individual or the community. We can reduce the amount of waste generated by judicious use of resources. Articles may be recycled or up cycle to reduce the waste production.

- d. **Sustainable social security:** Humans are another important resource of the health care sector. They need to be recognized for their contribution. All workers at all levels have their own function. They need to be provided equal pay for their work without discrimination. The security of the people needs to be met to reach sustainable development. When the people feel secured they will perform better.

Equal opportunity should be given to all without discrimination based on gender, religion, caste or creed. It should be based on merit and work ethics. This will help in social sustainability.

Secured people also can lead a healthier life than those who do not feel the security of life. As mental health is one of the dimensions of health, feeling insecure will lead to an unhealthy life. This in turn will affect the social sustainability. The present generation is leading a very stressful life. Hence, there is increase in mental illness and increase rate of suicides. The security of living in a happy home or community, having a secured job where they are satisfied and leading a social life where they feel safe in the community will help bring sustainable development.

- e. **Sustainable transportation:** Public transport can be utilized instead of personal vehicles. The healthcare may provide a common transport vehicle for all the staff to reduce the emission of harmful gases from vehicles. Vehicles should be

maintained as per standards to keep the environment clean. Unused vehicles or condemned vehicles should be recycled or up cycled or disposed in the correct manner.

- f. **Sustainable e-practices:** Electronic health practices can be adopted to reduce the impact of waste generation from hospitals. For example, a person visiting a hospital for a consultation needs to travel by a vehicle. The vehicle will emit smoke which will pollute the air. But if the person, instead of visiting the hospital, consults the doctor via e-health practice, the emission of harmful gases from the vehicle to be used is reduced. This sort of practice should be encouraged. Technology can be utilized. Vehicle, fuel, money, human resource as well as time can be saved if we encourage-medicine or telemedicine in cases where it is possible.
- g. **Sustainable use of resources:** Water and a electricity are some of the natural resources which are a necessity in the hospital healthcare setting without which the hospital cannot function. These resources need to be used wisely. Some methods to save the energy are switching off fans and lights when not in the room, using water efficient faucets and showers to save water, upgrading the lighting system to a more efficient energy saving type. Natural light such as sunlight should be preferred to artificial light to save the energy. Water should be used in adequate proportion as and when required. Renewable resources can be utilized instead of non-renewable resources. Solar panels may be installed in regions where there is abundance of sunshine for solar energy. Wind energy may be used for the same. Waste water may be treated by various methods so that it can be reused. The health workers should be given educated regarding the importance of storing the resources for the future generation.

It is not only the natural resources that should be used judiciously, but other resources such as cotton, gauze, syringe, medications, etc also If these resources are not used sensibly it will lead to unnecessary wastage of resources and accumulation of a large amount of waste. For e.g. a dressing needs two pieces of a 2'' gauze piece. If the health worker takes out 3 (three) pieces of the item from the sterile container, she has wasted one piece. If there are 50 (fifty) health workers and each health worker waste 1 (one) piece per day, it will amount to 50(fifty) pieces per day. This will amount to 18250 (eighteen thousand two hundred and fifty) pieces in a year. This is an example of only one hospital. Thus, we can understand the amount of waste generated if we do not use the resources wisely. Management should provide workshops and programmes to teach and remind the health workers on the importance of resources.

- h. **Sustainable allocation of resources:** The resources in the healthcare sector are varied and many. They need to be properly allocated and managed. If the resources are available in abundance, the workforce may use them lavishly without any consideration for the future. Thus, the management should allocate the resources carefully as per the need of each department. A surgical department will need more gauze piece as compared to the dental department. The medical department may need more IV drip sets as compared to the OPD department. Hence resources are to be indent as per requirement.

On the other hand, mediations and other items with expiry date, from the store should be indent as per the need so that they will not expire before they are utilized. The different departments have to work together for this practise to be maintained.

- i. **Sustainable surrounding:** The surrounding is another factor to consider for sustainable development. Planting more trees and plants around the hospitals will not only help in bringing fresh air but also beautify the area as well. The plants will help to absorb the harmful gases and provide more oxygen for the living beings. The beautiful surrounding will also up lift the spirit of the patients as well the workers in the hospitals. This can be extended to the community as well. Education may be imparted to the community through various programmes on the importance of plants.
- j. **Sustainable laws:** The Governments have a very important role in this area. They can pass laws to stop the practices which hamper the environment and affects sustainable development. These laws should be enforced strictly. The Government may also provide the alternative resources at a subsidiary rate to encourage use of renewable resources instead of non renewable resources.

VI. BARRIERS

People have understood the need to preserve the natural resources and to conserve the environment. They have understood the importance of respecting the creation. But implementing the measures of sustainability is very difficult. Some points that hinder the implementation of these measures are:-

- a. **Lack of political will:** Countries need to develop new laws and regulations to bring about sustainable development. The focus should be on all people without discrimination. Equal opportunities should be given to everyone in the healthcare sector. Their basic human needs should be met. Laws should be passed and implemented to protect the environment. This requires all the sectors to work together. The Government should pass the bill and make the laws. The concerned department should observe that the law is being implemented and followed in the correct manner. The people should obey the law and not break it. Due punishment should be given to those who do not follow the given laws and statutes.
- b. **Lack of resources:** To maintain a hospital which is moving towards sustainable development comes at a very high cost. The lack of resource is one of the main cause which blocks sustainable development. Many healthcare sectors do not have the money, man or material to function at that level. Sometimes a hospital may desire to upgrade the departments to an environmental friendly hospital but due to lack of resources, it is unable to do so.
- c. **Lack of expertise:** It is not easy to find new measures because there is lack of expertise. New diseases such as the COVID 19 emerge and without proper research, it is very difficult to treat such diseases. Since the concept of sustainable development has just recently started evolving, many of the people are not well aware of the term. There are very few experts in this field. Hence this becomes a barrier in maintaining sustainability.
- d. **High cost of implementing sustainable measures:** Healthcare is a necessity for all. It needs to be provided to all without discrimination and possibly at the same cost. Healthcare needs to be affordable by all. Maintaining a hospital which adapts to the rules of sustainable development is very costly. This poses as a barrier especially to the under developed and developing countries. Installation of solar panels cost a lot of money and is not possible for a small set up. Upgrading the system requires a large amount of capital. Hence the health care sector is unable to do so.

VII. CONCLUSION

Sustainable development is a very broad concept and requires a multidisciplinary approach. Various sectors such as industries, environment, law, agriculture, health, education, etc. needs to work together to achieve the goals of sustainable development.

Health care sector is a growing industry. It is an indispensable sector. Healthcare facility needs to be provided to all without any discrimination. It is that sector which will provide life to the dying but it is also the sector which will bring death to the living if care is not taken to maintain it. Healthcare is a major contributor to the environmental pollution as well as a major consumer of natural resources. We should be more open to changes that will about a balance between the society and the environment.

More research should be done to identify the contribution of healthcare sector to green house gases and proper guidelines should be given to bring down the emission of these gases from the healthcare sector. Sustainability in all dimensions needs to be addressed so that the future generations may lead a healthy and prosperous life.

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