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Assessment the legal awareness of waste management in Lucknow city with special reference to biomedical waste after covid-19 pandemic

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Abstract
Industrialization and Globalization play a vital role in the Sustainable Development in order to achieve the Global Goals as accepted by the United Nation which helps in the sustainability of environment and socio-economic development of the nations. Today the one of the major challenge before the nations is the waste management especially biomedical waste after the covid-19 pandemic, which is injurious to the human health and environment. This biomedical waste generated from the health care center, hospitals, animal research center and dental clinics etc. Under this research paper researcher finds the legal awareness of waste management and its impact on the human health and environment.

Keywords: biomedical waste, environment, human health and sustainable development and Covid-19

Introduction

Right to pollution free environment and healthy life is not only the legal and statutory right but as human right and natural right, which is available for all irrespective of any discrimination. '*Right to Life'* as foreseen by virtue of Article 21 of Indian Constitution and Article 25(2) of the Universal Declaration of Human Rights promoting the right to a standard of adequate living for health and well-being of the individual including medical care, sickness, and disability. The right to real enjoyment of the '*right to life'* in the context of management and disposal of medical waste understood as the protection of civil and political rights as well as an economic, social, and cultural right [1]. Human beings are encircled with the environment in which there are various challenges and risk for the human health and environment also. The environment ties people's surrounding everything and it includes physical, biological, social, and cultural factors [2]. After Covid-19 the one of the major threat for human health and environment is waste generated from the medical health center and hospitals. With the mushrooming growth of medical hospitals, biomedical waste has become a serious health hazard in many nations across the world. However, several difficulties are being confronted with the execution of waste management rules. As the researches outlined that out of total waste produced from the hospital waste approximately 10% is hazardous, 85% is general waste while a small percentage (5%) is labeled as highly hazardous [3]. India is one of the first developing countries, which has shown a great concern for the menace of bio-medical waste and has made an exhaustive attempt to regulate it [4]. Of late, the MoEF Government of India in the exercise of powers under sections 3, 6, and 25 of the Environment (Protection) Act, 1986 had framed the Rules, the Bio-Medical Waste (Management and handling) Rules, 1998. Such rule is amended many times in last two decade. Recently, the central pollution control board issue guidelines for the Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/ Quarantine of *Covid-19* Patients [5]. These guidelines are based on current knowledge on *Covid-19* and existing practices in management of infectious waste generated in hospitals while treating viral and other contagious diseases like HIV, H1N1, etc. Further, it provides some do and don'ts practices for the quarantine camp, center and home-care. These are as following:

To care takers of Covid-19 patients under home-care shall store the biomedical waste in yellow coloured bag provided by urban local body and Covid-19 patient at home-care shall handover the yellow bag to authorized waste collector from urban local body or common biomedical waste treatment facility operator.

The general waste from home care or quarantine center or quarantine camp shall be handed over as solid waste to authorized waste collector of urban local body.

Home quarantine or other households shall store used masks & gloves immediately in paper bag for minimum of 72 hours may be cut into pieces prior to disposal to prevent re-use prior to handing over the same to waste collector of urban local body as general solid waste.

Do not re-use surgical masks or gloves and never dispose off used masks of suspected or confirmed (mild symptomatic or asymptomatic) Covid-19 patients in bags other than yellow bag.

Quarantine center or camp or homecare shall never store biomedical waste for more than 48 hrs.

Meaning of biomedical waste

According to the parent rules on bio-waste it considered in the numerous categories as *human anatomic Waste, animal waste, microbiology and biotechnology waste; waste sharps; discarded medicines and cytotoxic drugs, soiled waste, liquid waste, incineration ash, and chemical waste*. The biomedical waste means waste generated during medical research, testing, diagnosis, immunization, or treatment of either human beings or animals [6].

Legal Instruments on biomedical waste

The conservation, sustainable use of natural resource and waste management has been arrested the global attention since last more than three decades at international and national level. In this regard, the international environmental

consciousness was developed in 1960 and finds a kind maturity only in the post-1970s in the form of various conventions having sectoral approaches to arrest the problem [7]. The depletion of natural resources, environmental deterioration, and pollution has drawn the serious attention of the global community for the first time in 1972 to develop green fraternity was the Stockholm Conference [8]. There are some important conventions for the environment protection and waste management as following:

a. Stockholm Declaration on Human Environment
b. Convention on the Control of Transboundary Movements of Hazardous Waste,1989
c. The United Nations Conference on Environment and Development, 1992
d. Waigani Convention, 1995
e. Bamako Convention, 1998
f. Rotterdam Convention, 2004
g. Minamata Convention on Mercury, 2013

Objective of research

The objective of the research paper as following:

a. To find out the legal knowledge on biomedical waste by people.
b. To find out the practice of waste management by people.
c. To find out the awareness for environment protection.
d. To find out the adverse impact of biomedical waste on human health.

Research methodology

A research methodology may be defined as; it is an outline of how a given piece of research is carried out. It defines the techniques or procedures that are used to identify and analyses information regarding a specific research topic. The present research paper is empirical study in nature which involves empirical data to answer research questions. The researcher tries to investigate through empirical data.

The study area/universe

The universe under the study is a finite universe in Lucknow city of Uttar Pradesh State, India. Lucknow serves as the capital of Uttar Pradesh in North India with a vast and rich heritage. Geographically, the City of Nawabs and its culture reflect a perfect momentum as far as the recent developments are considered. The present status of population, Sexratio of Lucknow City is given below [9].

Table 1:

Lucknow City	Total	Male	Female
City Population	2,817,105	1,460,970	1,356,135
Literates	2,081,727	1,124,261	957,466
Children (0-6)	293,697	154,226	139,471
Average Literacy (%)	82.50 %	86.04 %	78.70 %
Sexratio	928	-	-
Child Sexratio	904	-	-

Discussion

There are many challenges arising during and after the Covid -19, which gave an adverse impact on the socio-economic development of the county. In the context of the human health and environment protection, the biomedical waste generated during the medical care of Covid patients is a major challenge. The Fig: 1 shows that 87% maximum number of respondents of the research is known this is as challenge before the society and the government whereas there is still some part of the society untouched or unaware about the biomedical waste.

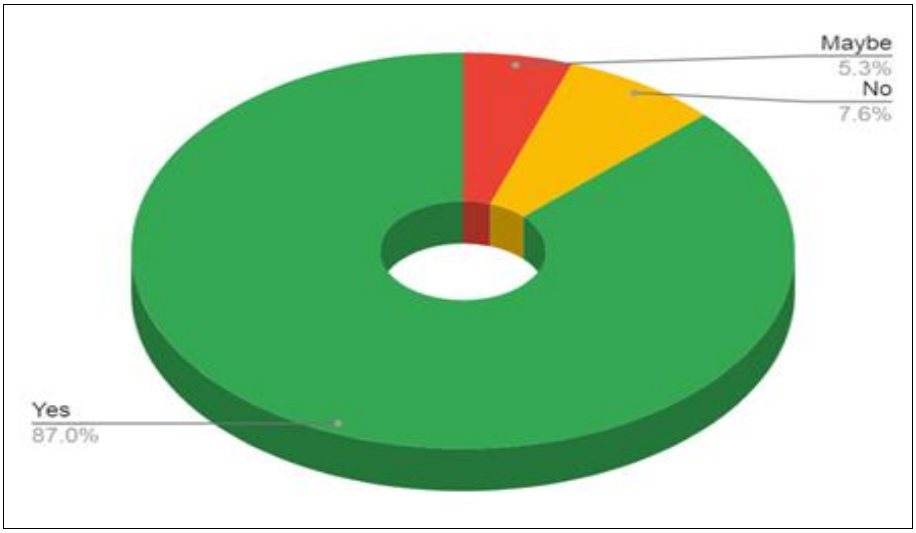

Fig 1

Generally, the major source of biomedical waste is medical health care center and hospitals. Covid -19 pandemic increasing the growth of biomedical waste and the research find that 77.7% of the people are known about the major source of biomedical waste but the distinction between the different categories of wastes are unknown. Fig 2 revels that people are known about the source of biomedical waste but as per the Fig 3 shows that people are says that biomedical waste is hospital waste and it is also collected from the houses, dental clinics, and industry also. But in fact industrial waste, electronic waste, solid waste and plastic wastes are different. They should not be mixed with each other otherwise, it will adversely affect the human health and environment.

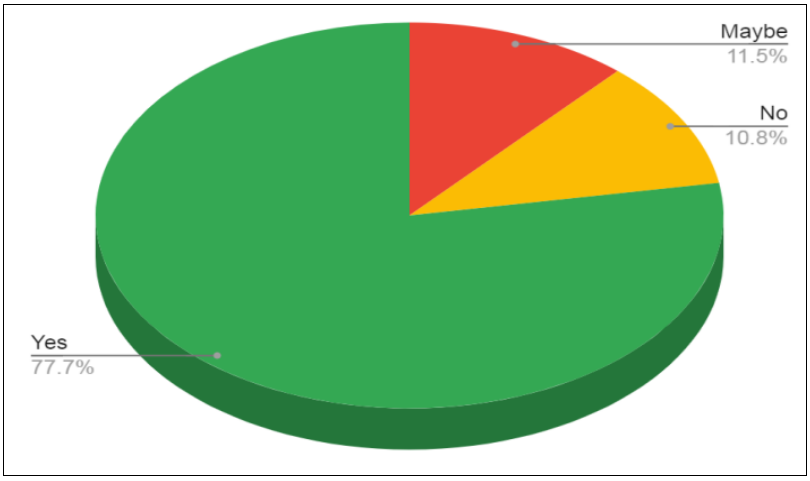

Fig 2

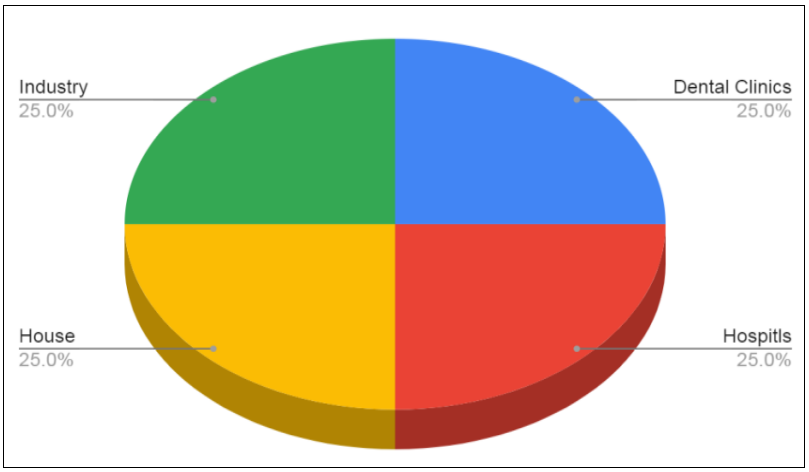

Fig 3

These biomedical wastes are hazardous to the human health and environment. As there are various probability for the spared of infectious diseases by the unplanned and mismanagement of biomedical waste. The research shows that maximum number of people agree that biomedical wastes are hazardous for human health and environment. Fig 4 shows that maximum percentage of people is strongly agree with the negative impact of the biomedical waste.

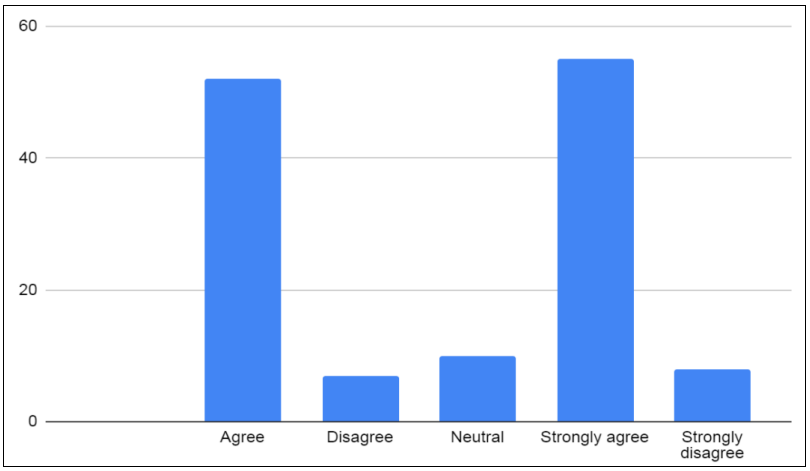

Fig 4

As the nature of law is dynamic and it is changeable form time to time. In India mistake of fact is excusable but mistake of law not. Therefore, it is mandatory for all the people to be aware about the laws in general in the social interest. In India for the very first time in the year 1998 for the management and handling of biomedical waste, the Central government made the rule as empowered by the Environment Protection Act, 1986. The Fig 5 shows that 57.4% of the people are known that there is a law for the biomedical waste but still maximum number of people in

society is unaware about the legal knowledge in general. They only heard about it and not the Biomedical management and handling rules.

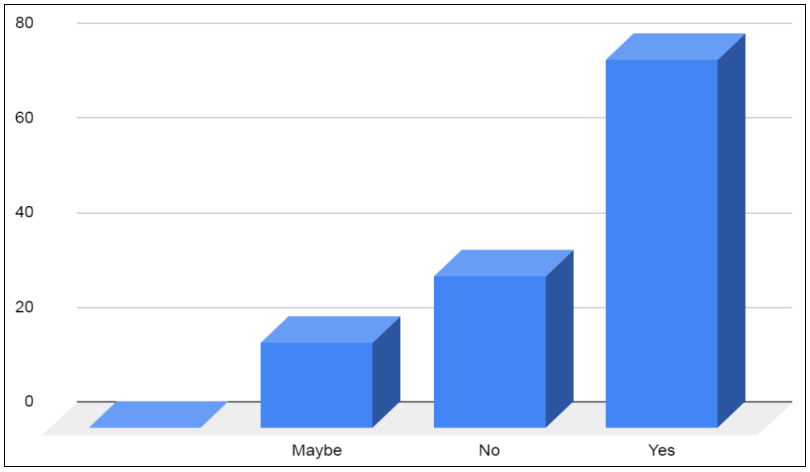

Fig 5

Further, the research shows that some people who are having the legal knowledge regarding the biomedical waste rules is from the newspaper, government program and radio as a medium of communication to the public at large. It shows that newspapers play a very significant role in people awareness program. Fig 6 designates 48% people are heard about biomedical waste from the newspaper whereas 39% are from the government program and rest from the various other sources like radio etc.

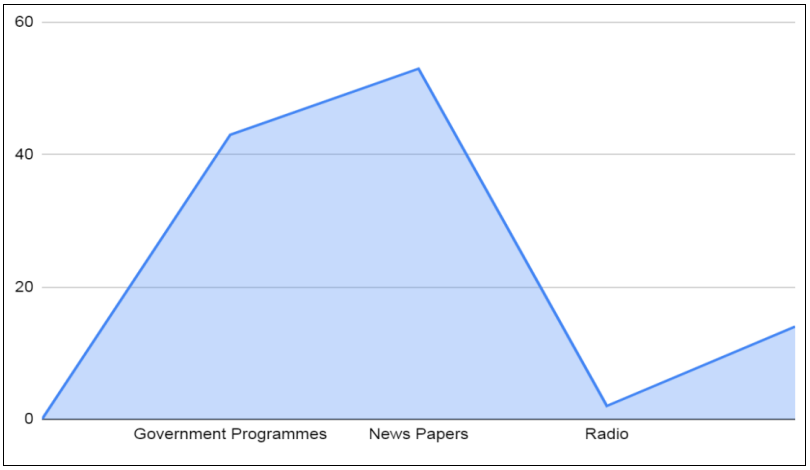

Fig 6

Fig 7 shows that 85.2% of people are agree and aware that the biomedical waste should not be mixed with other solid waste because for the proper waste management there are several rules made by the government from time to time.

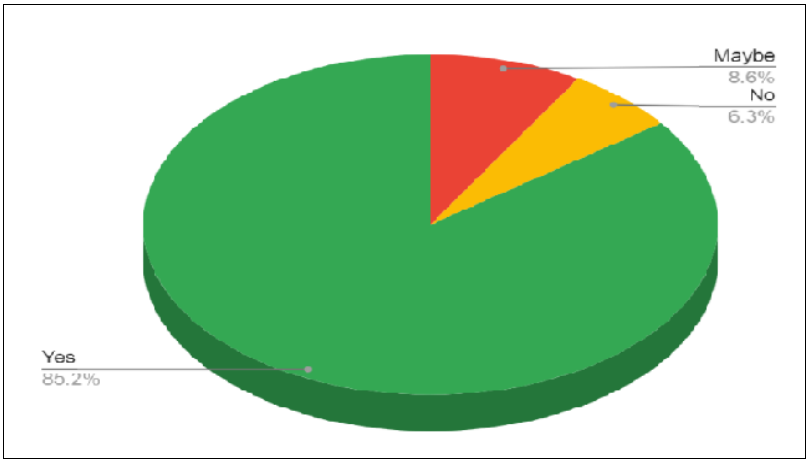

Fig 7

Conclusion and suggestion

Therefore, In conclusion we can say that environmental law in India is growing year by year. New dimensions of legal control are added and new challenges are opened up before the Courts. The ethos of judicial approach to environment has changed in consonance with the mounting national awareness, and with the global perspective of environment and development. It became more sever particularly during the ongoing Covid -19 pandemic. There are some significant suggestions as following:

a) It is necessary for all the healthcare workers from administration level to field workers that they must know the waste management laws.
b) It is required that there must be classification of biomedical waste correctly and identifying the kind of waste. It should be avoid to putting non-hazardous waste in with the hazardous waste to prevent overspending.
c) There must be separation of waste by its types and it should be separated out into the different categories, including sharps, pharmaceutical, chemical, pathological and non- hazardous.
d) The regulation of biomedical waste bags should be proper and sharps waste that goes into the bags must be put into puncture-proof containers first.
e) It is must to use right biomedical waste containers. It is necessary to put all the waste in approved containers depending on how it's classified. There are some wastes which can go in certified cardboard boxes, while other waste gets put in special tubs or even locked up transit.
f) It is necessary to maintain proper documentation of biomedical waste because it is crucial to protect both the provider and the waste disposal agencies.
g) The Biomedical waste containers and bags must be tapes for shipment, and then packed according to weight restrictions.
h) There should be right biomedical waste disposal company. The multiple regulating bodies, various hazards and several different kinds of waste present a daunting challenge for healthcare workers.

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