Chapter 15
Effects of Sustainable Medical Waste Management on the Environment and Human Health

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ABSTRACT

The increase in the number of health institutions, developments in technology, and the use of devices and materials utilized in diagnosis and treatments have increased the types and amount of medical waste. Therefore, it has become a necessity to reduce the health problems, remove the risks that may arise for human health, and protect the environment by effectively managing the medical wastes that are the results of the activities of health institutions. Hazardous medical wastes that harm humans and environmental health are a risk factor for the whole society. For this reason, removal, collection, temporary storage, recycling, transportation, and disposal of medical wastes without harming people and the environment includes technical, administrative, and legal processes. This study summarizes the current literature for sustainable waste management, its relationship to environmental and human health, and international legislation on waste management.

INTRODUCTION

Medical waste management has become one of the complex and challenging processes humanity faces due to the rapid growth in global population and increased demand for health care. Waste coming from health institutions is called hospital waste and it causes environmental pollution. Such waste may create significant health risks for hospital workers, patients, and the community (Ozder, Teker, Eker, Altındis, Kocaakman, & Karabay, 2013, p. 1). For this reason, in terms of human and environmental health, it is very important that waste resources are used efficiently, and that medical waste is disposed of without harming human and environmental health. Medical waste is a particular type of waste that can create risks in this sense (Gao, Shi, Mo, Nie, Yang, Rozelle, & Sylvia, 2018, p. 2). Ineffective management of waste adversely affects the environment and human health (Abdulla, Qdais, & Rabi, 2008, p. 450).

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Sustainable waste management is an important issue in terms of environmental and economic development, and protection of human and environmental health. (Cansaran, 2010, p. 1). Therefore, the aim in waste management is to provide an ecological and economic balance in a sustainable environment and to enforce policy and laws that will provide benefits to the individual and the society (Aydemir, 2017, p. 295; Akkucuk, 2017).

Medical waste may consist of infectious, radioactive, toxic, or genotoxic substances as a result of activities carried out by hospitals, clinics, laboratories, and veterinary clinics (Insa, Zamorano, & López, 2010, p. 1049). Such waste constitutes environmental and occupational health risks (Ali, Wang, Chaudhry, & Geng, 2017, p. 1). In addition, it is generated at health centers, dental clinics, acupuncture centers, patient care at home, and other institutions where medical care and treatment is provided (Insa et al., 2010, p. 1049).

Waste generated during health services carry more environmental and human health risks than other wastes. This situation requires the safe management of medical waste and the completion of related processes with reliable methods (Aydemir, 2017, p. 296). If such waste is not managed and destroyed using proper methods, it poses serious threats to human health and the environment. For this reason, it is necessary to separate the waste in the place where it is produced and to manage it in accordance with legal regulations (Ozder et al., 2013, p. 1).

The objective of this article is to evaluate the relationship between sustainable medical waste management and the environmental and human health and to monitor international legislation in the light of literature.

SUSTAINABLE MEDICAL WASTE MANAGEMENT

Definition of Medical Waste

The term 'medical waste' is defined as "the flow of waste collected from health institutions, research facilities, laboratories and from emergency aid donations, according to the World Health Organization (WHO) (Örgev & Utku, 2017; Gencer & Akkucuk, 2016). It also refers to residues resulting from health services and medical procedures performed in hospitals, clinics, laboratories, veterinary clinics, and research centers (Windfeld & Brooks, 2015, p. 99). Hospital waste is a specific type of waste that carries a high potential of infection and injury (Amin, Gul, & Mehrab, 2013, p. 2). The recent definition of medical waste by World Health Organization also includes the waste that is generated as a result of healthcare services given at home (Windfeld & Brooks, 2015, p. 99).

In addition, wastes from small or scattered sources such as wastes generated during home medical care (dialysis, insulin injections) are included in the scope of medical wastes (Örgev & Utku, 2017). The definition of medical waste varies from country to country. While medical waste is defined as "waste generated by research related to human and/or animal health" in Chapter 18 of the European Waste Catalog of European Union, it is defined as "waste generated by the diagnosis, treatment, or immunization of human beings or animals, and by the related research or production and testing of biological products" in the USA at the Medical Waste Tracking Act of 1988 (Windfeld & Brooks, 2015, p. 99).

Medical waste is all kinds of waste that cause infection when they come into contact with humans, generated by medical, nursing, patient care, dental, veterinary, pharmaceutical or similar applications and treatment, care, education, and research or blood collection (Güvez, Dege, & Eren, 2012, p. 42).