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Assessment of Healthcare Waste Management Practices at Seti Provincial Hospital, Nepal

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Abstract

Globally, healthcare waste (HCW) is recognized as the second most hazardous type of waste after radioactive materials. Improper management of HCW poses significant risks to healthcare workers, patients, surrounding communities, and the environment. This study aims to assess the current status of HCW generation and management at Seti Provincial Hospital in Nepal. Conducted over a 15-day period, the study evaluated the quantity and handling practices of HCW within the hospital. The waste collected was categorized into hazardous and non-hazardous types. The average HCW generation rate was found to be 0.55 kg per patient per day, with 65.98% classified as non-hazardous and 34.02% as hazardous. Findings indicate that the hospital's HCW management practices require significant improvement. To ensure sustainable and safe waste handling, the adoption of scientifically sound and environmentally responsible methods for segregation, collection, transportation, storage, and disposal is strongly recommended.

Open Access

Keywords: Healthcare waste, hazardous waste, hospital waste management, medical waste segregation, seti provincial hospital

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Background

Healthcare waste (HCW), also referred to as hospital waste or biomedical solid waste, is recognized as one of the most hazardous categories of waste globally (Arab et al., 2008). While healthcare services are essential for protecting health and saving lives, they also generate substantial amounts of waste that, if not properly managed, can pose serious threats to human health and the environment (Mbarki et al., 2013; Abor, 2007). HCW encompasses a wide range of materials, including used needles, sharps, chemicals, pharmaceuticals, and medical devices (Ghimire & Dhungana, 2018; Paudel & Pradhan, 2010; Uwa, 2014; WHO, 2018). Contaminated sharps, in particular, are known vectors for the transmission of infectious diseases such as hepatitis B, hepatitis C, and HIV/AIDS (WHO, 2017; Rodriguez, 2013; Onta et al., 2007; Yadav et al., 2002; Boojh, 2006; Nema et al., 2011). Improper handling of HCW can lead to occupational injuries, toxic exposure, and environmental contamination (Manyele, 2004; Johannessen et al., 2000).

Managing HCW is especially challenging in developing countries due to limited technological capacity, financial constraints, inadequate training, and insufficient staffing (Alagoz & Kocasoy, 2007). Nepal faces similar challenges (Joshi, 2013; Majumder et al., 2007). Although developed countries generate more HCW due to advanced medical technologies and disposable equipment (Minoglou et al., 2017), the rate of HCW generation in developing nations is rising with the expansion of healthcare services (Chaudhary et al., 2015). The quantity of HCW generated is influenced by several factors, including population size, healthcare demand (El-Salam, 2010; Manga et al., 2011), GDP, health expenditure, and environmental indicators such as carbon emissions (Windfeld & Brooks, 2015; Minoglou et al., 2017). Even within the same country, HCW generation rates can vary based on hospital size, available services, and waste segregation practices (Adhikari & Supakankunit, 2014; Kumar & Gupta, 2017). Epidemics and pandemics further exacerbate waste generation, straining existing waste management systems (Woolridge & Hoboy, 2019; Yu et al., 2020).

According to WHO (2017a), approximately 15% of HCW is hazardous, while the remaining 85% is non-hazardous. In Nepal, the situation is concerning due to widespread mismanagement, including uncontrolled

Table 1

Healthcare Waste Generation Rate of Some Country Including South-East Asian (SEA) Region

Country	HCW rate	References
Nepal	1.35 kg/patient/bed/day	(WHO, 2017a)
China	0.18 – 0.68 kg/bed/day	(Gao et al., 2018; Yong, Gang, Guanxing, Tao, & Dawei, 2009)
Iran	4.46 - 4.72 kg/bed/day	(Farzadkia, Akbari, Gholami, & Darabi, 2018; Shakiba & Mohagheghian, 2018)
Iran	2.3 -2.76 kg/bed/day infectious waste	(Farzadkia, Akbari, Gholami, & Darabi, 2018; Shakiba & Mohagheghian, 2018)
Bangladesh	0.90 kg/bed/day	(Hasan & Rahman, 2018)
Bangladesh	0.18 kg/bed/day Hazardous	(Hasan & Rahman, 2018)
Turkey	1.68 kg/bed/day	(Korkut, 2018)
Lebanon	0.20 – 2.45 kg/bed/day	(Maamari, Brandam, Lteif, & Salameh, 2015)
Ethiopia	1.66 - 3.79 kg/bed/day	(Meleko, Tesfaye, & Henok, 2018)
Burundi	4.13 ± 3.35 kg/bed/day	(Niyongabo, Jang, Kang, & Sung, 2019)
Burundi	0.27 ± 0.17 kg/patient/day	(Niyongabo, Jang, Kang, & Sung, 2019)
Palestine	0.97 kg/bed/day	(Al-Khatib, Khalaf, Al-Sari, & Anayah, 2020)
Palestine	1.95 kg/patient/day	Niyongabo, Jang, Kang, & Sung, 2019)
India (Uttarakhanda)	0.201 - 0.267 kg/bed/day	(Thakur & Ramesh, 2018)
India (Uttarakhanda)	0.007 -1.823 kg/patient/day	(Thakur & Ramesh, 2018)
Nigeria	0.181 kg/bed/day	(Awodele, Adewoye, & Oparah, 2016)
Indonesia	0.68 kg/bed/ day	(WHO, 2017a)
Bhutan	0.2 kg/bed/day	(WHO, 2017a)
Bangladesh	0.28 - 1.9 kg/bed/day	(WHO, 2017a)
India	0.277 kg/bed/day	(WHO, 2017a)
Thailand	0.81 kg/bed/day	(WHO, 2017a)
Shrilanka	0.36 kg/bed/day	(WHO, 2017a)
Iraq (Bagdad)	0.436 - 0.682 kg/bed/day	(Ali, 2018)

dumping and burning, lack of infrastructure, and poor enforcement of regulations. Despite the existence of national laws such as the Solid Waste Management Act (2011), Public Health Service Act (2018), and Environmental Protection Act (2019), implementation remains weak (Khatri, 2019). Local governments, such as Dhangadhi Sub-Metropolitan City, have also enacted their own waste management regulations, but challenges persist. International conventions like the Basel Convention (1989), Stockholm Convention (2004), and Minamata Convention (2017) provide frameworks for managing hazardous waste and pollutants. However, in Nepal, technologies such as incinerators and autoclaves often remain non-functional due to high costs, lack of spare parts, and limited technical expertise (Onta et al., 2007, Maharjan et al., 2019).

Effective HCW management is a cornerstone of green healthcare systems (Sayigh & Fadda, 2019). It requires strategic planning, leadership, and adherence to national and international standards (Babu et al., 2009). Moreover, HCW management is directly linked to the achievement of Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being) and SDG 6 (Clean Water and Sanitation). This study aims to assess the current HCW generation and management practices at Seti Provincial Hospital, Nepal. It seeks to identify gaps and recommend sustainable, environmentally sound practices that align with national policies and global health and environmental goals.

A Direct Weighing Method was employed to quantify healthcare waste (HCW) generated at SPH. This method involved the physical collection and periodic weighing of waste materials. The waste was categorized into two main types: hazardous and non-hazardous. Each category was sampled, sorted, and weighed separately to determine the quantity and composition. The study was conducted over a 15-day period, from 13 to 27 May 2019, using a mixed-methods approach that combined both quantitative and qualitative data collection techniques. Daily waste generation was recorded from each active department to estimate the average HCW output. In addition to waste quantification, a standardized checklist was used to observe existing HCW management practices. Observations and discussions were conducted with relevant staff to assess procedures related to waste collection, segregation, treatment, transportation, and final disposal. Supplementary data were gathered through a review of both published and unpublished literature, reports, and policy documents. All collected data were systematically analyzed and presented using tables and graphical representations to illustrate key findings.

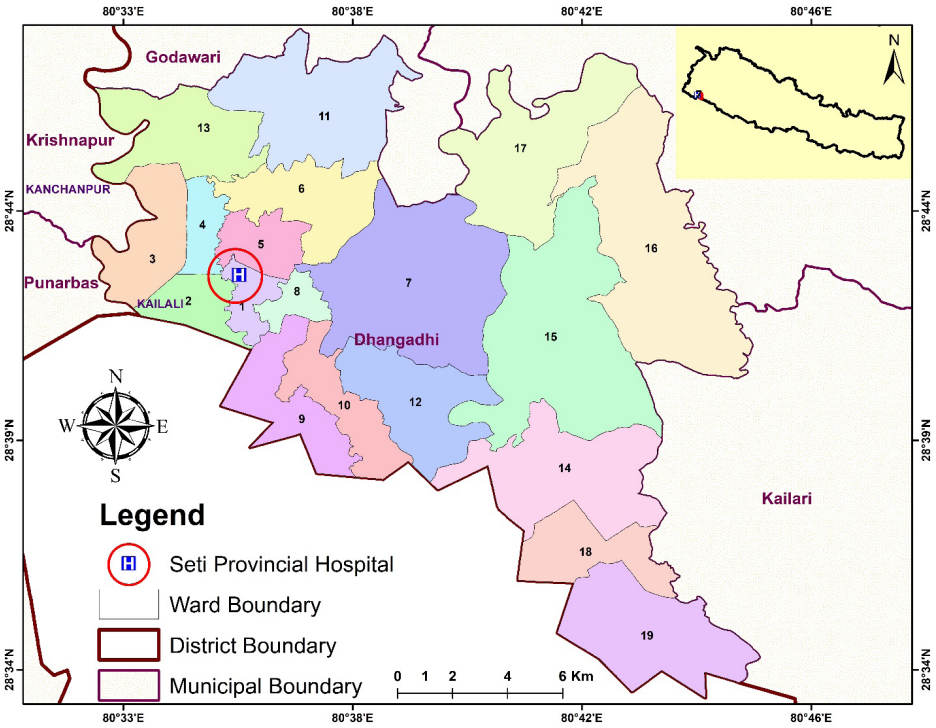
Materials and Methods

Study Area

Seti Provincial Hospital (SPH) is located in Ward No. 1 of Dhangadhi Sub-Metropolitan City (DSMC), Kailali District, in the Sudurpashchim Province of Nepal. The hospital has been operational since 1983 AD. DSMC spans an area of 261.75 km² and is divided into 19 administrative wards. According to the 2011 census (CBS, 2011), the city has a total population of 147,741, comprising 73,462 males and 74,279 females, with 29,143 households. Within DSMC, there are a total of 17 healthcare facilities (HCFs). SPH is a 125-bed hospital offering services through 17 departments. It is staffed by 179 medical personnel and 16 administrative staff members. The hospital serves an average of 350 patients per day.

Figure 1

Location of Seti Provincial Hospital



Limitations of the Study

This study, conducted in 2019 over a brief 15-day period, presents several limitations that affect the generalizability and comprehensiveness of its findings. Firstly, the short duration of data collection may not adequately capture variations in healthcare waste generation and management practices over time, such as seasonal trends or fluctuations in patient load. Secondly, the study did not include ward-wise or pharmacy-specific data, which are critical for understanding the differential waste generation patterns across hospital departments. The absence of long-term, daily monitoring data further limits the ability to assess consistency and sustainability of waste management practices. Due to these constraints, the findings may not fully represent the current or overall waste management scenario at Seti Provincial Hospital. Therefore, further in-depth and longitudinal research is recommended to provide a more robust and generalizable understanding of healthcare waste management practices in this setting.

Results and Discussion

Healthcare Waste Generation at SPH

During the 15-day study period, a total of 2,888.40 kilograms of healthcare waste (HCW) was generated at Seti Provincial Hospital (SPH), resulting in a daily average of 192.56 kg. The average HCW generation per patient per day was calculated to be 0.55 kg/patient/day, while the average waste generation per hospital bed was 1.54 kg/bed/day.

Table 2

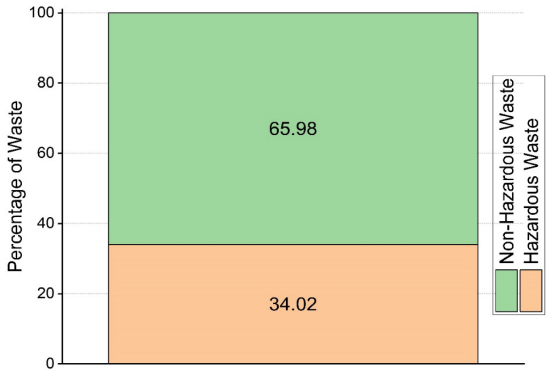
Waste Generation per Patient per Day at the Seti Provincial Hospital, Sudurpaschim Province, Nepal

S.N.	No. of days	15
1	Average Patient per day	350
2	Average HCW per day (Kg)	192.56
3	Average HCW per patient/day (Kg)	0.55
4	Average HCW per beds (kg) in 15 days	23.11
5	Average HCW per beds/day(kg)	1.54
6	Hazardous waste per patient/day(kg)	0.19
7	Hazardous waste per beds/day(kg)	0.52
8	Non-Hazardous Waste per patient/day(kg)	0.36
9	Non-Hazardous Waste per beds/day(kg)	1.02
10	Hazardous Waste (%)	34.02
11	Non-Hazardous Waste (%)	65.98
12	Total HCW (Kg) in 15 days	2888.4
13	Total Hazardous HCW (Kg) in 15 days	982.7
14	Total Non- Hazardous HCW (kg) in 15 days	1905.7

During the 15-day study period, a total of 982.7 kg of hazardous waste and 1,905.7 kg of non-hazardous (general) waste were generated at SPH, accounting for 34.02% and 65.98% of the total HCW, respectively. This proportion of hazardous waste is significantly higher than the WHO global estimate of approximately 15%, indicating a potential concern in waste segregation or healthcare practices at the facility. Interestingly, a similar proportion of hazardous waste was reported by Shakiba et al. (2018) in the northern region of Iran, suggesting that such elevated levels may not be uncommon in certain regional or institutional contexts. The average daily generation of general and hazardous waste per patient was found to be 0.36 kg/patient/day and 0.19 kg/patient/day, respectively. When calculated per hospital bed, the average daily generation was 1.02 kg/bed/day for general waste and 0.52 kg/bed/day for hazardous waste.

Figure 2

Graph Representing Hazardous and General Waste



Comparative Analysis of Healthcare Waste Generation

The findings of this study are broadly consistent with several previous studies conducted in Nepal and other regions. For instance, Shrestha (1997), as cited by Majumder et al. (2007), reported an average HCW generation of 0.54 kg/patient/day and 0.16 kg/patient/day of healthcare risk waste (HCRW) in hospitals of Kathmandu figures closely aligned with the 0.55 kg/patient/day and 0.19 kg/patient/day observed in this study. Similarly, Onta et al. (2007) conducted surveys in Patan Hospital and Koshi Zonal Hospital, reporting waste compositions of 1) Patan Hospital: 63.5% general, 27.8% hazardous, and 8.8% sharps, 2) Koshi Hospital: 68.4% general, 28.4% hazardous, and 3.1% sharps, 3) National Kidney Center: 50% general, 17% hazardous, and 33% sharps (with a 60.7% bed occupancy rate). The general-to-hazardous waste ratio

in this study (65.98% general, 34.02% hazardous) is comparable to Patan and Koshi hospitals but contrasts with the National Kidney Center, where sharps constituted a significantly higher proportion.

Majumder et al. (2007), in a study across six hospitals from 2004 to 2007, found an average waste generation of 0.66 kg/person/day, comprising 0.13 kg/day/person of infectious and 0.53 kg/day/person of non-infectious waste (22.07% and 77.93%, respectively). Compared to this, the current study reports a slightly higher proportion of hazardous waste and a lower proportion of general waste, though the total waste generation rate is nearly three times higher. In contrast, the findings of this study are lower than national estimates and other studies. According to WHO (2017a) and assessments by the Ministry of Health (MoH) and Department of Health Services (DoHS), the national average HCW generation was 1.35 kg/patient/bed/day. Similarly, Paudel & Pradhan (2010) reported 0.8 kg/patient/day at Narayani Sub-Regional Hospital, with daily waste generation of 96.8 kg general (75.4%), 24.1 kg hazardous (18.8%), and 7.5 kg sharps (5.8%).

Some of the other studies include: 1) ENPHO (2000): 1.72 kg/person/day total waste and 0.48 kg/person/day infectious waste in Kathmandu Valley, 2) Regmi et al. (1987) (cited by Sapkota & Devkota, 2003): 1.27 kg/patient/day, with 75% non-hazardous and 25% hazardous waste, 3) KMC (1999): 0.31 kg/person/day infectious waste with 70% bed occupancy, 4) Sapkota & Devkota (2003): In Bir Hospital, 82.3% general, 15.8% hazardous, and 1.9% sharps; in TU Teaching Hospital, 84.2% general, 13.5% hazardous, and 2.3% sharps; in Patan Hospital, 16% general, 71.2% hazardous, and 12.8% sharps figures that contrast sharply with this study. Additionally, HECAF (2011) reported 1.23 kg/patient/day at Bir Hospital, and Joshi et al. (2017) found an average of 3.3 kg/patient/day across 62 healthcare institutions, with 2.0 kg non-hazardous and 1.0 kg hazardous waste.

Despite these variations, the HCW generation rate at SPH falls within the South-East Asia (SEA) regional range of 0.2 to 0.8 kg/bed/day (WHO, 2017a). This trend reflects the growing demand for healthcare services and the corresponding increase in waste generation over time.

Management Aspects of Healthcare Waste at SPH

The healthcare waste management (HCWM) practices at Seti Provincial Hospital (SPH) were found to be unsatisfactory, with several critical gaps identified across the waste management chain. Although some foundational systems are in place, the overall implementation lacks consistency, training, and infrastructure.

Waste Segregation: SPH has adopted a color-coded bin system—black, green, and red—to segregate paper, plastic, food waste, and blood-stained materials, respectively. Segregation is practiced at the source; however, instances of hazardous waste being disposed of in general waste containers were observed. This indicates poor compliance and awareness among staff. Similar issues have been reported in healthcare institutions in Ethiopia (Yazie, Tebeje, & Chufa, 2019).

Waste Collection: Waste is collected in three shifts—morning, day, and evening—by designated HCWM personnel. The collection process is manual, and waste is temporarily stored within the hospital premises. However, the lack of dedicated collection tools such as trolleys and the use of common pathways for waste transport raise concerns about hygiene and safety.

Waste transportation: Transportation of waste from the point of generation to the storage area is carried out manually along shared hospital pathways. Personnel involved in this process were observed not using basic personal protective equipment (PPE) such as gloves and masks, indicating a lack of training and awareness regarding occupational safety.

Waste storage: Stored waste was found in uncovered containers, often mixed and placed haphazardly. Despite initial segregation, waste is re-mixed during handover to the municipality, highlighting the absence of a structured mechanism for the safe handling and disposal of segregated waste.

Waste treatment and disposal: The hospital relies primarily on open burning and incineration for waste treatment. Although two incinerators are available, they are used exclusively for placenta disposal. Most of the waste is handed over to the municipality for final dumping. This practice mirrors trends in many developing countries, where hazardous and general waste are often disposed of together, posing significant health and environmental risks (Da Silva et al., 2005).

Identified shortcomings: Key shortcomings in SPH's HCWM system include:
- Irregular waste collection

- Lack of dedicated trolleys and transport routes
- Mixing of hazardous and general waste
- Inadequate PPE for staff
- Absence of a comprehensive waste treatment and disposal plan

These issues reflect broader challenges observed in other healthcare institutions across Nepal and similar developing contexts (Mmereki et al., 2017; Niyongabo et al., 2019). The findings suggest that SPH is not in full compliance with Nepal's National Healthcare Waste Management Guidelines (2014) (WHO, 2017a). A comparable situation was reported at Narayani Sub-Regional Hospital, Birgunj, where poor waste management was attributed to the lack of a formal waste management plan and carelessness among patients, visitors, and staff (Paudel & Pradhan, 2010). Moreover, HCWM effectiveness is closely tied to budget allocation. In Nepal, healthcare institutions allocate less than 5% of their total budget to waste management, which significantly hampers the implementation of safe and sustainable practices (Joshi et al., 2017; Yazie et al., 2019).

Table 3

Segregation and Treatment Procedure

Category of waste	Type of waste	Dustbin color	Treatment process
General	Plastic and paper	Black	Handover to municipality
General	Food waste	Green	Handover to municipality
Hazardous waste	Syringe, broken glass, blood stained products	Red	Handover to municipality

Some HCI's in Nepal have already followed the HCWM Guideline (2014) and they have formulated HCWM committee in their Hospitals and have already adopted technology such as incinerator and autoclaves. Although the HCWM Guidelines, (2014), specifically focus on adoption of non-burn technology for the proper management of HCW, many HCF's still use onsite treatments such as open burning or low technology incinerators, which leads to the release of toxic gases into the environment. Some HCI's have already adopted a concept of zero waste for safe and environmentally sound HCWM (E.g. Bir Hospital adopted non- burning technology such as autoclaves to manage the HCW) (WHO, 2017a). However, autoclaves have own drawbacks (Windfeld & Brooks, 2015)including the common sources, governing legislation and handling and disposal methods. Many developed nations have medical waste legislation, however there is generally little guidance as to which objects can be defined as infectious. This lack of clarity has made sorting medical waste inefficient, thereby increasing the volume of waste treated for pathogens, which is commonly done by incineration. This review highlights that the unnecessary classification of waste as infectious results in higher disposal costs and an increase in undesirable environmental impacts. The review concludes that better education of healthcare workers and standardized sorting of medical waste streams are key avenues for efficient waste management at healthcare facilities, and that further research is required given the trend in increased medical waste production with increasing global GDP.","author":[{"dropping-particle":"","family":"Windfeld","given":"Elliott Steen","non-dropping-particle":"","parse-names":false,"suffix":""},{"dropping-particle":"","family":"Brooks","given":"Mari anne Su Ling","non-dropping-particle":"","parse-names":false,"suffix":""}],"container-title":"Journal of Environmental Management","id":"ITEM-1","issued":{"date-parts":[["2015"]]},"page":"98-108","publisher":"Elsevier Ltd","title":"Medical waste management - A review","type":"article-journal","volume":"163"},"uris":["http://www.mendeley.com/documents/?uuid=b7ee68a8-149a-49dd-ac4e-c66233525938"]}],"mendeley":{"formattedCitation":"(Windfeld & Brooks, 2015. Waste generation source, categorization, quantity and quality are the key issues to decide an effective medical waste management practice (Mbarki et al., 2013). Segregation of infectious waste at the source of generation is the key to achieving a sound medical waste management.

Nepal Health care strategy 2015-2020 ensures for the 'Improve quality of care at point-of-delivery' and was set as an indicator for 'improved infection prevention and health care waste management practice' with following key intervention to achieve the outcomes: (1) Review and enforce standards for infection prevention and HCWM, and (2) Promote state to state partnership model for waste management. Also, this strategy set an ambitious aim to ensure that HCFs segregating HCW at the time of collection and it's safely disposal will be achieved 100% by the end of 2020 with the baseline year 2015 (MoHP, 2015). However, the country lacks a central treatment facility for final disposal and treatment of HCW (WHO, 2017a), and lack of strict implementation of the HCWM guidelines, (2014). Hence, the Hospital gives the waste to the municipal waste collectors or undertakes onsite treatment of waste. However, Solid Waste Management Act Dhangadhi (2018) has a provision for operating health care waste management

treatment and storage center collaborating with health care institutions located in DSMC. And National Environmental Policy (2019) has a strategy for safe disposal of non-reusable waste in landfill site, hazardous waste landfill site and incineration plant as per need. The status of poor waste management currently practiced in the Hospitals poses a high risk to the health of the general public, patients, healthcare staff, waste handlers and pickers and also pose a serious threat to the people in and around the dumping sites.

Environmental assessment report prepared prior to the establishment of hospital could be the one useful tool for adopting healthcare waste management. However, this hospital was established before the enforcement of Environment Protection Act (2019) which had the legal provision to carry out IEE/EIA. So, preparation of internal healthcare waste management guideline following the national legal provisions, guidelines and best available technology/ practices. Monitoring of hospital by concerned authorities can be useful for ensuring sound health care waste management.

Thus, this study aligns with several Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being), SDG 6 (Clean Water and Sanitation), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action). Proper management of healthcare waste reduces the risk of infections and diseases, ensuring a healthier environment for patients, healthcare workers, and the community. Effective waste management practices prevent contamination of water sources, contributing to cleaner water and better sanitation. Promoting sustainable practices in waste segregation, collection, and disposal supports responsible management of resources and reduces environmental impact (Figure 3 and Figure 4). By implementing environmentally accepted waste management practices, the hospital can reduce its carbon footprint and contribute to climate action efforts.

Figure 3

Graph Representing the General Process of Sustainable Solid Waste Management Practices

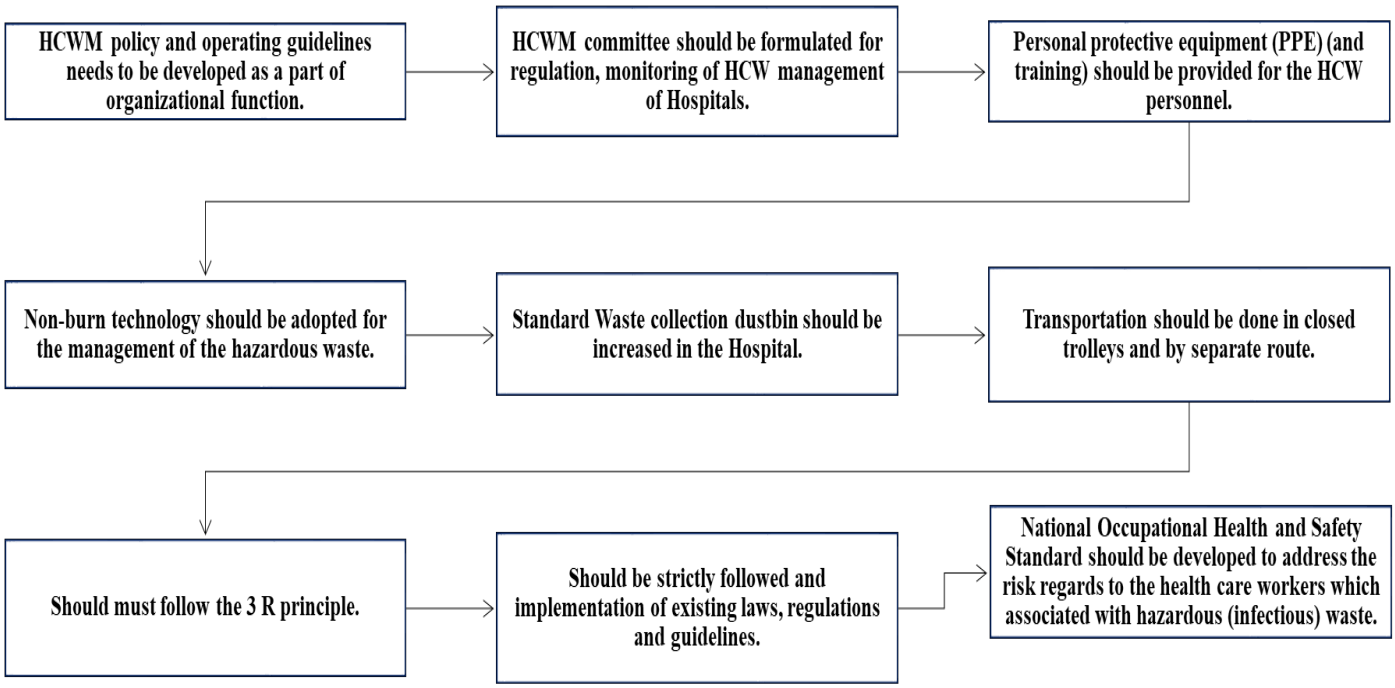


Figure 4

Graph Representing the Health Care Waste Management Practices

Some of the Risk Associated with Environment with Prevailing Practices

The health care waste that are generated in Seti Provincial hospital is not getting as much attention as needed. Potential public health risk and an environmental burden increases because of improper HCW management. (Mato et al., 1999) which can be of have both short- and long-term effects (Misra, & Pandey, 2005).

Risk associated with the human health: The proper organized HCW management should be done to check public health risks as well as occupational hazards among healthcare workers as a result of poor waste management (Mbongwe et al., 2008).The hazards of exposure to hospital waste can range from gastro-enteric, respiratory, and skin infections to more deadly diseases such as HIV/AIDS, and Hepatitis (Hanumantha, 2008 ; Babanyara, 2012). Similarly, it also has carcinogenic effects, reproductive system damage, respiratory effects, central nervous system effects, and many others. (Mato et al., 1999).

Occupational health hazards: To achieve a safe work environment, and ensuring patient and staff safety awareness of appropriate waste management procedures and occupational safety measures is fundamental for safe work environment (Anozie et al., 2017). This can reduce different kind of occupational health hazard risk among medical personnel, visitors and hospital waste management personnel which is prevailing in SPH.

Hazards to the general public: Improper practices such as dumping of health care waste leads to the spread of diseases. It also effects the scenic beauty and produces unpleasant smell. Along with-it animals and bird can also be negatively affected as they can be injured (Babanyara, et al., 2013).

Risk associated with environment: There are so many gaps that need to be improved in order to perform environmentally sound health care waste management in case of Seti Provincial hospital.

*Open burning and incineration:*Open burning and incineration of medical waste generated creates many problems. As, the major source of dioxins like toxic air pollutants and toxic ash residues in the environment are emitted (Gautam et al., 2019) which linked to severe public health threat and pollution (Bassey et al., 2006).

Common disposal site: There are absences of proper landfill site even for municipal waste. So, all the healthcare waste and municipal waste is deposited on common site which can create a great health risk to municipal workers, the public, and the environment (Lbijoke et al., 2013) and increases issues like drinking water contamination, soil contamination, occupational risk and ground water contamination, especially if dumps are located to frequent flooding (Patwary et al., 2011).

Hospital sewage effluents: There is no treatment mechanism for sewage effluents coming from hospital. Not only this, all the hospital effluents get mix with municipal sewage. These effluents are loaded with pathogenic microorganisms, pharmaceutical partially metabolized, radioactive elements and other toxic chemical substances and can have negative effects on receiving water bodies and living species (Emmanuel et al., 2002) as it increases the pollutant concentration (T. M., & Plosz, B. G. (2008). So, there is an

importance of reducing the environmental pollutant load even at hospital before being discharged (Azuma et al., 2019).

Conclusion

The findings of this study indicate that healthcare waste management (HCWM) practices at Seti Provincial Hospital (SPH) are currently inadequate and require significant improvement. The hospital generates an average of 0.55 kg of healthcare waste per patient per day, a figure that underscores the importance of effective waste handling systems. While basic segregation practices are in place, critical gaps remain in the areas of storage, transportation, and treatment of waste.

The presence of hazardous waste in general waste containers, lack of protective equipment for waste handlers, and reliance on open burning or low-technology incineration methods highlight systemic challenges. These issues are compounded by limited awareness, insufficient training, and budgetary constraints, all of which hinder the implementation of safe and sustainable HCWM practices. Overall, the current waste management system at SPH poses risks not only to healthcare workers and patients but also to the broader community and environment. Addressing these challenges is essential for aligning with national guidelines and international health and environmental standards.

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