INDIAN SOCIETY OF HOSPITAL WASTE MANAGEMENT

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Theme : Managing Healthcare Waste For a Sustainable Future

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Oral Presentation

Occupational Injuries Among Healthcare Workers at KGMU, Lucknow: A Retrospective Single-Centre Study

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Out of the 183 only 59 (32%) reported within less than 2 hours, 76 (42%) reported within 2 to 24 hours, 31 (17%) reported within 24 to 72 hours. But the matter of concern was that nearly 17 (9%) of the health care workers reported after 72 hrs. Amongst these 17 cases, 3 for hepatitis B virus, 8 for human immunodeficiency virus (HIV) and 3 for hepatitis C virus and 2 were unknown. PEP needs to be started as soon as possible after the exposure (Ideally within 2 hours but certainly within 72 hours) PEP is not effective when given more than 72 hours after exposure.

Out of 183 individuals evaluated for their Hepatitis B vaccination status, merely 105 (57%) were fully vaccinated. Furthermore, 30 individuals (16.4%) had not completed the entire vaccination course, and 48 individuals (26.2%) had not received any vaccinations. This data underscores a substantial risk for many healthcare workers.

Following the analysis of 183 individuals' viral statuses after ORIs, it was found that HIV had the highest number of reactive tests with 91 individuals, Hepatitis B (HBV) followed with 22 reactive cases, while Hepatitis C (HCV) recorded 14 cases. On follow up none of them have reported seroconversion till date.

Occupational-related injuries (ORIs) were predominantly observed in the wards, which constituted 90 (49.18%) of the total incidents. The operating theatre (OT) was the second most common location, with 43 (23.50%), followed by the emergency department at 24 (13.11%). The laboratory accounted for 10 (5.46%), the labour room for 8 (4.37%), the intensive care unit (ICU) for 5 (2.73%), and the outpatient department (OPD) for 3 (1.64%).

Conclusion

While there seems to be a growing awareness of the PEP programme among healthcare workers, additional education is necessary to mitigate the existing stigma. Furthermore, enhanced counselling is essential to highlight the significance of medication adherence and the necessity of regular follow-ups. Occupational injuries among healthcare workers are prevalent, particularly among Residents and nursing staff. Needle-stick injuries are the most common types observed. Most critically, it is imperative to instil universal precautions and safe practices among healthcare workers, while completely discouraging needle capping and promoting proper disposal methods. KGMU conducts regular training and awareness programs for all health care workers but then still appears to be gap in knowledge and practice.

Biomedical Waste Management in Ayush: Challenges and Solutions

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Keywords: BMW, BMWM, AYUSH, Ayurveda, Yoga, Unani, Siddha, Homeopathy

INTRODUCTION

Biomedical waste management (BMWM) is a critical issue in healthcare, with significant implications for environmental sustainability and public health. AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homeopathy) too contributes to the generation of biomedical waste. This paper aims to explore the challenges, regulations and best practices associated with BMWM in the AYUSH system and the extent of awareness and compliance among practitioners and institutions within this sector.

AYUSH systems, being natural and holistic, are often perceived as less harmful to the environment. However, they also generate waste, including herbal residues, animal-derived products, expired medicines, and sharps. Managing this waste effectively is crucial to prevent contamination, pollution, and spread of infections. This paper investigates the current state of biomedical waste management in the AYUSH system, highlighting both challenges and opportunities.

OBJECTIVES:

- To assess the current biomedical waste management practices in AYUSH healthcare facilities.
- To identify the unique challenges and opportuni-

ties in biomedical waste management specific to AYUSH systems.

- To develop a comprehensive framework for integrating sustainable practices in biomedical waste management across different AYUSH systems.

METHODS / METHODOLOGY

Mixed-methods approach combining quantitative and qualitative research methodologies with stratified random sampling was used. 238 AYUSH healthcare facilities hospitals, clinics, research centers, and educational institutions across Uttar Pradesh, between February 2024 to September 2024, were assessed through structured questionnaires and observational checklists for waste segregation, storage and disposal practices.

RESULTS

Out of 238 facilities only 68 (28.6%) were following norms for effective BMW disposal. Out of 170 (71.4%) facilities not using any kind of BMW management practices, 38 (22.36%) facilities did not know if it applied to AYUSH system as well, while 132(77.64%) had the impression that it was only for government hospitals and medical colleges.

CONCLUSION

Effective biomedical waste management cannot be achieved until all healthcare facilities employ it effectively. Besides it is essential for the sustainability of the AYUSH system, ensuring that traditional practices do not inadvertently harm public health or the environment. While challenges exist, particularly in awareness, infrastructure, and compliance, there are significant opportunities for improvement through targeted training, investment in infrastructure, and research. As AYUSH continues to grow in popularity, prioritizing waste management will be crucial in maintaining its integrity and safety.

LEGAL ASPECTS OF BIOMEDICAL WASTE -A Review

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Introduction: Bio Medical Waste is one of the world's most serious environmental issues. It is any waste produced during the diagnosis, treatment, or immunization of human or animal research activities pertaining thereto or in the production or testing of biological or in health campus. It is therefore essential that such wastes are treated and managed in an efficient manner for which proper regulatory, as well as the institutional framework, is required. Unregulated BMW M has posed a grave threat not only to human health and safety but also to environment for the current and future generations.
Aim: To analyse the legal aspects of managing biological waste, including pertinent laws, requirements for compliance, and the consequences of non-compliance. This article will provide insights on the effects of improper waste treatment as well as how laws influence waste management procedures in hospital settings.
Methodology: A review of research articles was performed from databases using keywords biomedical wastes, healthcare units, government, management, law, treatment technologies. The relevant studies between 2017-2023 were considered for the present study.
Results: The search resulted 50 studies to be screened and 10 studies met the inclusion criteria of the study. Maintaining environmental integrity and protecting public health in biomedical waste disposal requires strict adherence to legislative requirements. Establishing a culture of accountability and responsibility helps facilities lower the hazards of inappropriate waste disposal. Because of Lack of training programs there is a significant gap in knowledge among healthcare workers regarding specific legal requirements for biomedical waste management.
Conclusion: BMWM should ideally be the subject of a national strategy with dedicated infrastructure, cradle to grave legislation, competent regulatory authority and trained personnel. The standards , norms and rules on Bio Medical Waste Management in a country regulate the disposal of various categories of Bio Medical Waste are envisaged therein so as to ensure the safety of the staff, patients, public and the environment in furtherance to its vehement commitment to ensure the fundamental right to live in clean and safe environment.

An Experience of Sustainable Waste Management in the Healthcare Sector.

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Keywords: Sustainable Waste Management, Waste Management, Carbon Emissions, Recycling wastepaper, Recycling, Green House Gas Emissions.

Abstract: Hospital waste has substantial environmental and health impacts. Inappropriate disposal of hazardous waste can lead to environmental pollution, which also affects ecosystems and public health, contributing to the spread of diseases. Among other industries, the waste generation in the healthcare industry or hospitals is unique and, at the same time, critical, as it includes the cluster of infectious, sharp, chemical, pharmaceutical, radioactive, and at the same time general waste. Effective waste management, including segregation, safe disposal, recycling, and proper treatment, minimizes the risk of the spread of infections and protects both hospital personnel and the surrounding community. Additionally, it promotes sustainability and resource conservation. In our study, we analysed the records of waste disposal focusing on waste streams other than biomedical waste like paper, linen, plastic, metals, and e-waste. The trinity of waste management principles is Reduce, Reuse, and Recycle. The Institute has recycled 4461 quintals (446100 Kgs) of wastepaper since 2016 which could save carbon emissions of more than 2.2 million Kgs CO_2 which shows the positive impact the institute has had on the environment in the last eight years through a simple intervention of recycling wastepaper. Also, the hospital has gained over ₹ 16 million by auctioning waste in the last seven years. It emphasizes that recycling is essential to lowering carbon emissions. The study also emphasizes that efficient waste management has indirect advantages, such as improved institutional reputation, regulatory compliance, and direct financial savings. In the end, these initiatives lead to better healthcare delivery.

Risk Management in Secondary Care District Hospital at Lucknow

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Keywords: Risk management, Healthcare, Patient care etc

Introduction

Risk management in healthcare is complex set of clinical and administrative systems, processes, procedures, and reporting structures designed to detect, monitor, assess, mitigate, and prevent risks to patients. This activity performs the assessment of risks and highlights the interprofessional team's role in management of risks in the healthcare setting.

Objectives:

- To assess the current status of Risk management processes at the Hospital using comprehensive checklist by CNA insurance.
- To suggest recommendations based on the results of the study

RESULTS-The key findings of compliances of risk management in all the areas of district Hospital based on checklist of risk control by CAN insurance
Not Started – Those services or control facilities which have not been utilised so far as per checklist
Beginning stage – Services are in inception stage as per checklist.
Partially implemented – Services were started they are functioning but lack adequacy and planning
Fully implemented- Services are fully functional with regular updates.
Conclusion: Owing to rising cases of litigation against Hospital risk management is becoming more and more crucial for better patient care and to provide sustainable

work environment for healthcare professionals.

E-waste Management: Awareness, attitude, and practices among Medical Students in the state of UP, India.

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Introduction:

E-waste is a pressing environmental and public health issue, given the hazardous materials it contains. India ranks among the world's largest producers of e-waste, yet e-waste management practices remain inadequate. Medical students, as future healthcare leaders, play a crucial role in promoting e-waste management, but there is limited data on their awareness, attitudes, and practices. This study investigates these aspects among medical students at King George's Medical University (KGMU), Lucknow, Uttar Pradesh.

Objective:

To assess the awareness, attitudes, and practices regarding e-waste management among medical students at KGMU, Lucknow, and identify areas for intervention.

Methodology:

A cross-sectional study was conducted involving 364 medical students at KGMU, using a structured, self-administered questionnaire. The questionnaire collected data on demographic details, knowledge of e-waste and its health risks, attitudes toward responsible disposal, and current personal disposal practices.

Results:

The study found that 71% of students were aware of e-waste and its associated health risks, and 93% held a positive attitude toward proper e-waste management. However, despite the high levels of awareness and positive attitudes, actual disposal practices were poor, with most students disposing of e-waste alongside general waste.

Conclusion:

Although awareness and attitudes toward e-waste management are generally high among KGMU medical students, there is a significant gap in actual disposal practices. Targeted educational programs and accessible disposal facilities are needed to improve e-waste management practices among medical students, enabling them to act as advocates for environmental health in their communities.

Assessment of Current Awareness on Bio-Medical Waste Management Among Doctors, Nurses, and Housekeeping Staff in a tertiary care hospital: A Cross-Sectional Study

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ABSTRACT

Background: Biomedical waste management plays a crucial role in maintaining infection control within healthcare settings. Poor management of biomedical waste can lead to environmental hazards and a heightened risk of hospital-acquired infections (HAIs), affecting both healthcare workers and patients. In India, despite the introduction of guidelines for proper BMWM, compliance varies, particularly across different categories of healthcare workers. This study aims to assess the awareness levels and practices related to biomedical waste management in a tertiary care center and examine their impact on infection control(1).

Objective: To assess the level of awareness regarding biomedical waste management among healthcare professionals, including junior doctors, nurses, paramedical staff, and housekeeping staff. Additionally, the study seeks to analyze the correlation between awareness of BMWM and infection control practices within the facility(2).

Methodology: This cross-sectional study was conducted in a tertiary care center in India. A total of 100 participants were included, comprising doctors, nurses, paramedic staff, and housekeeping staff(3). A structured 20-item questionnaire was designed and distributed to doctors, nurses, and paramedical staff to assess their knowledge, attitude,

and practices as per new Biomedical waste management guidelines, including questions on waste segregation, handling, transportation, and disposal(4). To account for differences in education and job responsibilities, a separate, simplified questionnaire was designed for housekeeping staff to assess their awareness of the basic principles of BMWM. The data were analyzed using descriptive statistics, and correlations between BMWM awareness and infection control practices were explored.

Results: The results revealed significant variability in the awareness and practices of BMWM among the different healthcare groups. The majority of the respondents were Males (57%) with a mean age of 27 (±5) years. About 94% of them follow color codes for biomedical waste disposal. And 76% are sure that it is followed correctly in their hospital. Only 26% of people are aware of the proper methods for disposing of pharmaceutical waste. However, practical challenges, such as improper segregation of waste and incomplete adherence to waste disposal guidelines, were identified across all categories. The study found a positive correlation between higher awareness levels of BMWM and improved infection control practices, with reduced incidences of HAIs reported in areas where BMWM protocols were strictly followed.

Conclusion: The study underscores the importance of improving awareness of biomedical waste management. The findings highlight the need for targeted training programs to bridge the gaps in knowledge and practice. Enhanced BMWM practices can significantly contribute to better infection control outcomes and optimize hospital-acquired infections. Ensuring that all healthcare personnel are adequately trained in BMWM is essential for maintaining a safe and hygienic hospital environment.

Keywords: Biomedical waste management, infection control, tertiary care center, healthcare workers, awareness, hospital-acquired infections (HAIs), waste segregation, training programs.

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Cost of Composting in a Tertiary Care Hospital in North India

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Keywords: Composting, Food compost, Vermicompost, Organic Waste.

Introduction: The management of solid waste generation is a significant challenge all across the world. In hospitals Bio-Medical Waste (BMW) waste constitutes 15% while general waste is 85%. Proper disposal of general waste is equally important as it ensures both decrease in spread of disease and lowering carbon footprints. Composting, acts as key component of integrated solid waste management, which can be applied to deal with food waste, garden waste and reduction of waste quantity as well. One of the methods are food composting and vermicomposting from leftover food and garden waste respectively which ultimately contributes in reduction of greenhouse gases like methane and landfill. The cost in making food compost and vermicompost comes as important aspect of study. In recent years, composting comes as a safe and sustainable alternative to manage and recycle organic waste and to promoting plant growth and protecting the environment.

Materials and Methods: An observational study was conducted in patient kitchen of a tertiary care hospital and in vermicompost unit for a period of six months. The patient kitchen had an attached food compost unit with capacity of 200 kg. Leftover food, along with vegetable and fruit peels used in meal preparation were included in study. The vermicompost unit have pits for making vermicompost by using garden waste, tree trimmings, fallen leaves with help of cow-dung and earthworms. The production cost for food compost and vermicompost was taken into consideration by calculating operational cost which consist of building cost, building depreciation cost, repair and maintenance cost, manpower cost, transport cost, consumables cost and electricity cost which ultimately results in cost per kg per month for making both type of compost.

Results: The tertiary care hospital had two composting

units- one food composting and one vermicomposting unit. An automatic food composter machine was installed in food compost unit which processed left-over food, vegetable and fruit peels to produce organic food compost while vermicomposting unit had 5 composting pits and one pre composting pit, for processing of tree trimmings, garden litters, fallen leaves for organic vermicompost production. The study resulted in production of 230 kg food compost and 133.33 kg vermicompost per month which gave cost of 113.98 rs. per kg and 141.97 rs. per kg respectively. This initiative not only reduced the volume of general waste and improved processing of food waste and vermicompost but also gave cost per kg of compost i.e of high-quality as per authorised body, which promoted plant growth and significantly lowered the cost of procurement of compost. This resulted in increase of environmental effectiveness and economic affordability.

Conclusion: This initiative is a step towards conversion of waste food into a valuable resource, reducing both environmental and economic burden.

A Thorough Examination of PPE Adherence by Biomedical Waste Management (BMWM) Employees and Waste Handlers, as well as Occupational Risks Emerging Among Employees As a result of non-adherence

Background: Biomedical Waste Management (BMWM) Employees and waste handlers play a vital role in disposing of healthcare waste, but they face a number of occupational risks, such as exposure to chemicals, infectious agents, and sharp objects. To protect their health, it is essential to make sure that these workers follow stringent Personal Protective Equipment (PPE) guidelines and are immunized against important diseases.

Objective: The purpose of this study is to examine the immunization status of waste handlers and BMWM employees, evaluate their adherence to personal protective equipment (PPE) use during working hours during the previous 400 days, and investigate the factors that affect this adherence. The study also aims to uncover safety practice gaps and draw attention to the workplace hazards these workers face.

Methodology: Using a cross-sectional methodology, the study collects data via direct observation and structured questionnaires. Information is collected on the prevalence and kinds of occupational dangers that employees encounter, compliance rates with PPE use, and vaccination status for diseases like tetanus and hepatitis B. Supervisor and employee interviews shed light on the obstacles and enablers influencing PPE compliance.

Results: Initial data points to differences in workers' immunization status, with some of them lacking essential vaccinations. Depending on the type of operation, PPE compliance rates vary, and some employees routinely wear only a part of the PPE. Inadequate PPE supply, inconvenience, and ignorance are among the causes of non-compliance. Reports of occupational dangers include respiratory problems, chemical exposure, and needlestick injuries were common.

Conclusion: The report emphasizes the necessity of rigorous vaccination coverage monitoring among BMWM employees as well as improved awareness efforts regarding the significance of PPE compliance. The hazards these workers encounter at work can be reduced with a multifaceted approach that includes training, frequent health examinations, and making sure protective equipment is available. The results point to practical ways to raise safety standards in BMWM Plants, which will ultimately promote a safer working environment for BMWM workers.

Intervention to improve the steps in Biomedical waste Management related to category A (Human Anatomical waste-amputated limbs) in the pre-identified area of the King George's Medical University (KGMU), Lucknow, Uttar Pradesh, India.

Himanshu Reddy, Kirti Srivastava, Aprajita Jaiswal, Anuj Singh

Keywords: Amputation, Bio-Medical Waste Management, Anatomical Body Parts, Swan-Neck Technique, Form for receiving amputated body parts, PPE

Introduction:

Amputation refers to the removal of a body extremity due to various factors such as blunt trauma, medical conditions, electric shock, burn, prolonged constriction, or surgical intervention. In healthcare settings, a limb amputation is the most prevalent surgical procedure performed in an operating theatre (OT). Out of total amputation cases, it has been found that 70% of these amputations are due to

traumatic injuries that occurred due to road traffic, railway & agricultural equipment accidents. Rest amputation cases are based on diabetic foot, burns, electric shock, sepsis, and neuropathy in the hospital setting. The bio-medical waste management cycle is crucial to ensure safe handling and final disposal of waste from the hospital, which prevents infection risks to the patients, health care providers and their surroundings. The standard operating procedure must made in each organisation and strictly adhere to the regulatory standards. Proper adherence to the protocol for managing biomedical waste generated from amputated cases involves a series of systematic steps. These steps include waste categorisation, segregation, collection, transport, treatment, and final disposal, all conducted in compliance with biomedical waste management guidelines. This systematic adherence minimises potential hazards to healthcare personnel, patients, and the environment, underscoring the importance of protocol-based management in maintaining hygiene and safety standards in medical facilities. The objective of the study is to assess the adherence rate to the protocol for biomedical management steps in amputated cases.

Methodology:

A cross-sectional study was conducted retrospectively from 1st September 2024 to 30th September 2024 in King George's Medical University, Lucknow. The data was collected from the departments of trauma surgery, burn, plastic, Casualty, orthopaedic OT, general surgery & trauma orthopaedic OT based on a pre-designed & validated observation checklist. Data was compiled together and analysed by using SPSS-23 software and Microsoft Excel. It is a descriptive & quantitative study where calculation is done to assess the proportion of the variables related to the steps of Biomedical Waste Management in amputated cases.

Results:

During the study period, a total of 44 cases were included in the analysis. We found that 88.6% of the cases mentioned the name of the received body part in the OT registers. In 95.5% of the cases, a yellow bag was used for packing anatomical body parts; however, in 34.1% of cases, a designated trolley was not used to transport the waste from the wards to the UED. Additionally, 75% were found properly tagged & 72.7% of cases were found securely and tightly packed. However, none of the cases used the swan-neck method to securely tie a risk waste bag. Complete use of PPE was observed in only 11.4% of cases, specifically from the Ortho OT and Casualty departments. Only 52.3% of the forms for receiving amputated body parts were found entirely completed & filled, 9.1% of the forms were blank, and the remaining forms were partially filled. The highest compliance rate for filled forms was observed in the Plastic (Burn) Surgery department. Among the completed forms received by the UED (11.4%), two were from Ortho OT, and one each from Ped Ortho, General Surgery, and Casualty departments.

Conclusion:

The study highlights significant gaps in compliance with OT protocols for documenting anatomical body parts received during amputation. The trollies were not found carrying specific colour code poly bags. These findings underscore the need for stronger adherence to PPE use among healthcare workers, improved training, and availability of supply of PPE in the hospital. The swan technique method should be used to tie a risk biomedical waste bag. The training is required to sensitise staff to the proper use of PPE and the completeness of amputated body part forms.

Zero Waste Hospitals: A Systematic Examination of Circular Economy Principles in Biomedical Waste Management

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Background: Contemporary healthcare systems confront an escalating environmental challenge characterized by the complex management of biomedical waste (BMW). While traditional linear waste models have predominated, emerging circular economy paradigms offer transformative potential for sustainable healthcare infrastructure.
Objective: This research critically analyzes the implementation of circular economy strategies in healthcare waste management, investigating innovative approaches that facilitate waste minimization, resource recovery, and systemic organizational transformation.
Methodology: Systematic review of waste managment protocols at leading international facilities and mixed method approach in india
Findings: Empirical evidence reveals three critical intervention strategies for BMW management: (1) strategic supply chain restructuring to prioritize reusable and recyclable medical materials, (2) sophisticated waste segregation mechanisms enabling precise material recovery, and (3) interdisciplinary collaborations with recycling ecosystems to repurpose medical waste streams.
Theoretical Contribution: The research extends existing sustainability frameworks by demonstrating how circular economy principles can be systematically operationalized within complex healthcare environments, challenging

traditional waste management paradigms.

Practical Implications: The proposed blueprint provides a robust, scalable model for healthcare institutions to simultaneously reduce environmental footprints, optimize operational costs, and advance organizational sustainability commitments.

Conclusion: This study illuminates the transformative potential of circular economy approaches in healthcare waste management, positioning medical institutions as pivotal actors in global environmental stewardship.

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A study on Hospital acquired infection in ICU and HDU of a tertiary care government hospital

Nabila Asif, Himanshu Reddy, Geeta Yadav, Sheetal Verma

Introduction

Hospital-acquired infections are major issue in most hospitals of India. They are nosocomially acquired infections that usually occurs after hospitalization and manifest in 48 hours after admission to the hospital. About 10-20% of admitted patients acquire nosocomial infections in India. Factors contributing to this include high patient load, inadequate infection control practices, and antibiotic resistance. HAI infections include central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), surgical site infections (SSI), Hospital-acquired Pneumonia (HAP), Ventilator-associated Pneumonia (VAP), and Clostridium difficile infections (CDI). HAIs lead to increased morbidity and mortality rates, longer hospital stays, and a higher financial burden on patients and healthcare systems.To lower the incidence of HAI , numerous hospitals have put strong preventive measures in addition to infection tracking and surveillance systems.
This study was aimed to evaluate the HAI, review the laboratory tests and summarize the management of HAI at the tertiary care hospital.

Materials and Methodology

The study was Cross-sectional study executed over a period of one month. It was conducted in ICU and HDU at the Department of Medicine of tertiary care government hospital. All the CLABSI, CAUTI, VAP were included in the study while the rest were excluded as the study was carried out in medicine department. Length of stay and outcomes were also included.

Result

On observation it was found that total patient load in ICU was 36 and HDU was 201. The average length of stay in ICU was 7.61 days and HDU was 6.58 days. It was observed that 35.5% of the total patient admitted in ICU and HDU were found to have HAI in a month. On reviewing the reports of each patient admitted, it was found that the following percentage of patients had hospital acquired infection. In ICU the percentage of CAUTI = 13.33% , CLABSI = 7.32%, VAP=14.29%. In HDU the percentage of CAUTI = 15.85%,CLABSI= 10.00%, VAP= 18.29%.

The organism most commonly detected:

On reviewing the microbiology reports the organism most commonly detected in patient's reports were Candida species ,Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylococcus aureus, Enterococci, Acinetobacter baumannii.

Contaminated samples:

Total contaminated samples in ICU was 19.44% and HDU was 25.87% due to inappropriate sample collection techniques by the staff of respective units.

Conclusion

Many standards have been evolved over time for the

performance and monitoring of central lines and practice of 4 Care bundles to prevent CLABSI,CAUTI,VAP and SSI.

A customised checklist for infection control should be made and implemented in the HDU and ICU of Medicine department.

Healthcare professionals should be trained in infection control protocols, practice hand hygiene , aseptic techniques when performing invasive procedures and antibiotic stewardship to prevent the emergence of multidrug resistant bacteria. The prevalence of HAIs in India is a critical public health issue that necessitates a comprehensive response involving improved infection control measures, increased awareness, and enhanced resources. Addressing this challenge is essential for improving patient safety and healthcare quality across the country.

Psychological Impact of Needle Stick Injury: A Descriptive Study of a Tertiary Care Hospital in India

Dr. R. Harsvardhan[1], Dr. Mahwish Suhaib[2] (Presenting Author), Dr. Saurabh Singh[3], Dr. Romil Saini[4], Dr. Anmol Jain[5], Dr. Abhishek Singh[2]

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Keywords: anxiety; depression; needlestick; needlestick injury; occupational health; psychological disorder; PTSD

Introduction: Needlestick injuries (NSIs) are a common occupational hazard with potential physical health risks, including viral infections like hepatitis and HIV. Less attention, however, is given to the psychological consequences of NSIs, including anxiety, depression & posttraumatic stress disorder (PTSD). The study aimed to assess the psychological impact of NSIs on doctors and nurses who experienced at a tertiary care hospital in Lucknow, Uttar Pradesh, India.

Material and Methods: This descriptive study was conducted over a period of 3 months. The study sample included doctors and nurses who experienced NSI within last 18 months. All other healthcare workers, as well as those who had not experienced NSI, were excluded. A simple random sampling technique was used to study calculated sample size of 107. A customised and validated questionnaire consisting of four sections was used as data collection tool. The sections included demographic details, NSI information, anxiety & depression assessment and scale to assess impact of event (NSI). For assessing anxiety & depression, a pre-validated Generalized Anxiety Disorder scale (GAD-7) & Patient Health Questionnaire (PHQ-9) were used, respectively while the Impact of Events Scale-Revised (IES-R) assessed the impact of injury. Statistical analysis of data was done using descriptive statistics.

Results: Among the participants, 45.79% were doctors and 54.21% were nurses. A sample portion (2.80%) had history of psychiatric illness, though none were on psychotropic medication during the study. The most common reason of NSIs was recapping needle (34.58%) followed by patient movement (22.43%). NSIs occurred most frequently in the wards (41.12%). A total of 9.35% of NSIs involved infectious sources, and anxiety & depression levels was higher in these cases. Severe GAD-7 scores were observed in 10.20% of doctors and 5.17% of nurses, while severe PHQ-9 scores were found in 4.08% of doctors and 5.17% of nurses. 11.21% of participants had IES-R score beyond the cutoff values indicating Post-Traumatic Stress Disorder.

Conclusion: NSIs not only pose physical health risks but also lead to significant psychological impacts, including anxiety, depression, and PTSD, particularly in cases involving infectious sources. There is a need for awareness and targeted interventions to address the mental health effects of NSIs among healthcare professionals.

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Poster Presentation

End to End Segregation of Biomedical Waste Generated During Bedside Procedures at Army Institute of Cardio Thoracic Sciences

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INTRODUCTION

Biomedical Waste Management rules- 2016 have significantly reduced the number of categories of Biomedical Waste, thereby reducing the errors at semi-skilled

housekeeper level who play a pivotal role in transport of biomedical waste from point of generation to kerb site for ultimate disposal by Common Bio Medical

Waste Treatment Facility. Still, inadvertent mixing of different categories of Biomedical waste remains a huge challenge for Healthcare workers & public safety.

Exploring Sustainable Wealth Generation through Waste Recycling: A Case Study of a Tertiary Healthcare Teaching Institute in Northern India

Name of Author/s and Affiliations:

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Background: Healthcare Institutions, including tertiary hospitals and teaching institutes, generate a substantial amount of biomedical waste due to their daily operations. This waste consists of various categories, such as infectious, pathological, pharmaceutical, and sharp wastes, all of which require specialized handling and disposal to prevent harm to the environment and human health. Improper management of biomedical waste can lead to the spread of diseases, contamination of water sources, and pollution of the air.

Objectives: The primary objectives of the study were as follows:
1. Assess the current practices of biomedical waste management within the healthcare institute.
2. Identify opportunities for waste recycling, and wealth generation.

Methodology: The study took place at SGPGIMS from February, 2023 to December, 2023. The Institute initiated revenue generation by selling non-hazardous materials collected on-site. These materials, managed by the Service Provider overseeing BMWM, were sorted and weighed for accuracy and purity before being sold for recycling. The prices, determined transparently by the Institute's competent authority, were based on market rates, material quality and available quantity, ensuring a fair and consistent approach to this revenue-generating initiative.
Result: This study evaluated the financial benefits of recycling biomedical waste in a healthcare institution, highlighting how effective waste management can be economically rewarding. The total waste generated from various items includes **44,960 kgs of cardboard** (Rs. 5,78,635.20), **3,810 kgs of LD saline bottles** (Rs. 2,86,664.40), **4,130 kgs of syringes** (Rs. 96,724.60), **9,340 kgs of canula pipes** (Rs. 2,39,104.00), **5,280 kgs of gloves** (Rs. 1,25,188.80), and **46,390 kgs of glass bottles** (Rs. 2,77,876.10), resulting in a cumulative total of 1,13,910 kgs and a revenue of Rs. 16,04,193.10.
Conclusion: In conclusion, this study demonstrated that recycling biomedical waste not only generated significant revenue but also promoted environmental responsibility. The initiative reduced disposal costs, minimized the carbon footprint, and conserved resources, transforming waste from a financial burden into a valuable asset. By adopting a systematic approach to waste management, the healthcare institution exemplified how responsible recycling practices can contribute to both economic growth and sustainability, serving as a model for similar organizations.

Transforming Food Waste into Nutrient-Rich Compost for Organic Agriculture

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Keywords: Composting, Food compost, Organic Waste.

Introduction: The management of solid waste generation is a significant challenge all across the world. In hospitals Bio-Medical Waste (BMW) waste constitutes 15% while general waste is 85%. Proper disposal of general waste is equally important as it ensures both decrease in spread of disease and lowering carbon footprints. Composting, a key component of integrated solid waste management, can be applied to food waste. One of the methods are food compost production from leftover food which ultimately contributes in greenhouse gases reduction like methane. In recent years, composting comes as a safe and sustainable alternative to manage and recycle organic waste and to promoting plant growth and protecting the environment.
Materials and Methods: An observational study was conducted in patient kitchen of a tertiary care hospital for a period of six months. The patient kitchen had an attached food compost unit which was the primary centre of the study. Leftover food, along with vegetable and fruit peels used in meal preparation were included in study.
Results: An automatic food composter machine was installed in food compost unit which processed left-over food, vegetable and fruit peels to produce organic compost. Average food compost generation was 230 kg per month. This initiative not only reduced the volume of general waste and improved processing of food waste but also produced high-quality compost, promoted plant growth and significantly lowered the cost of procurement of compost.
Conclusion: This initiative is a step towards conversion of waste food into a valuable resource, reducing both environmental and economic burden.

Compliance and Perceptions of Risk Among Biomedical Waste Handlers: A Mixed-Methods Observational Study at a Common Biomedical Waste Treatment Facility in Punjab

Authors: Dr. Sumreen Bhatia, Dr. Seep Sonali. MYAS-GNDU Department of Sports Sciences and Medicine, Amritsar.

Introduction: Effective biomedical waste management is essential for minimizing occupational health risks and environmental contamination. Biomedical waste handlers are at a heightened risk of infection and injury if proper safety protocols are not followed. Despite established guidelines, compliance in waste handling facilities remains inconsistent, often due to limited resources and training. This study evaluates compliance with biomedical waste management protocols and explores waste handlers' perceptions of risk, with the goal of informing targeted safety improvements.

Aims & Objectives:

1. To assess compliance across key safety areas, including PPE usage, waste handling practices, and workplace environment conditions.

2. To gather handlers' perceptions of occupational risks and recommendations for enhancing safety, thereby forming evidence-based recommendations for improved health and safety protocols.

Methodology: This mixed-methods, cross-sectional study was conducted at a common biomedical waste treatment facility in Amritsar, using a structured observational checklist and informal interviews with 15 biomedical waste handlers. Quantitative data on compliance were collected across five categories: PPE usage, waste handling procedures, safety practices, work environment, and availability of equipment. Qualitative data were gathered through semi-structured interviews to understand handlers' perceptions of risks and their suggestions for safety improvements. Descriptive statistics summarized compliance rates, while thematic analysis identified key insights from handlers.

Results: Significant compliance gaps were observed in PPE usage, with only footwear consistently used while gloves, face masks, protective eyewear, and clothing were absent. Waste handling procedures showed moderate compliance, with most protocols followed except for container closure, which increased spill risk. Safety practices revealed the lowest compliance, with zero adherence to hand hygiene, sharps handling, and PPE disposal protocols, creating a high risk of infection and injury. Work environment assessments identified adequate handwashing facilities but insufficient ventilation, lighting, and safety signage. Handlers expressed concerns over inadequate PPE and insufficient training, perceiving high occupational risks. Suggested improvements included regular safety training, better PPE provision, and enhanced facility infrastructure.

Conclusion: This study underscores critical deficiencies in compliance with biomedical waste management protocols and the need for enhanced safety measures. Handlers' perspectives highlight the importance of addressing PPE shortages, improving training, and upgrading workplace conditions. Implementing these targeted recommendations can significantly reduce occupational health risks and improve compliance, contributing to safer and more effective waste management practices.

A Thorough Examination of PPE Adherence by Biomedical Waste Management (BMWM) Employees and Waste Handlers, as well as Occupational Risks Emerging Among Employees As a result of non-adherence

Background:

Biomedical Waste Management (BMWM) Employees and waste handlers play a vital role in disposing of healthcare waste, but they face a number of occupational risks, such as exposure to chemicals, infectious agents, and sharp objects. To protect their health, it is essential to make sure that these workers follow stringent Personal Protective Equipment (PPE) guidelines and are immunized against important diseases.

Objective:

The purpose of this study is to examine the immunization status of waste handlers and BMWM employees, evaluate their adherence to personal protective equipment (PPE) use during working hours during the previous 400 days, and investigate the factors that affect this adherence. The study also aims to uncover safety practice gaps and draw attention to the workplace hazards these workers face.

Methodology:

Using a cross-sectional methodology, the study collects data via direct observation and structured questionnaires. Information is collected on the prevalence and kinds of occupational dangers that employees encounter, compliance rates with PPE use, and vaccination status for diseases like tetanus and hepatitis B. Supervisor and employee interviews shed light on the obstacles and enablers influencing PPE compliance.

Results:

Initial data points to differences in workers' immunization status, with some of them lacking essential vaccinations. Depending on the type of operation, PPE compliance rates vary, and some employees routinely wear only a part of the PPE. Inadequate PPE supply, inconvenience, and ignorance are among the causes of non-compliance. Reports of occupational dangers include respiratory problems, chemical exposure, and needlestick injuries were common.

Conclusion:

The report emphasizes the necessity of rigorous vaccination coverage monitoring among BMWM employees as well as improved awareness efforts regarding the significance of PPE compliance. The hazards these workers encounter at work can be reduced with a multifaceted approach that includes training, frequent health examinations, and making sure protective equipment is available. The results point to practical ways to raise safety standards in BMWM Plants, which will ultimately promote a safer working environment for BMWM workers.

Title for Oral Presentation

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2.	Bio-Medical Waste Management in Ayush: Challenges and Solutions	Dr. Lubna Kamal, Dr. Mohan Singh
3.	Knowledge, attitude and Practices regarding Bio-medical Waste Management amongst the Medical and Paramedical Staff in Tertiary Health Care Centre	Pushp Lata Shankwar, Rekha Sachan, ML Patel, Anuradha Nischal
4.	An Experience of Sustainable Waste Management in the Healthcare Sector	Dr. Saru Sethi, Dr. Pankaj Arora, Dr. Shailja
5.	Thematic Content Analysis of Open-Ended Question in a Study to Evaluate efficacy of Educational Program on knowledge and Practices of Biomedical waste Handlers in a Medical College	Dr. (Maj) Sushmit Pandey, Dr (Col) Neeraj Garg
6.	End to End Segregation of Bio-Medical Waste generated during bedside procedures at army institute of Cardio Thoracic Sciences	Maj (DR) Anish Mishra, Col (DR) Neeraj Garg
7.	Occupational Injuries Among Healthcare Workers at KGMU, Lucknow: A Retrospective Single- Centre Study	Dr. Abhishek Kumar Srivastava, Dr. Neera Verma, Prof. D. Himanshu, Prof. Kirti Srivastava
8.	Cost of Composting in a Tertiary Care Hospital in North India	Dr. Saumya Rawat, Prof. Kirti Srivastava, Prof. D. Himanshu, Dr. Nitin Dutt Bharadwaj, Dr. Anmol Jain, Dr. Mahwish Suhaib, Dr. Nabila Asif
9.	Evaluation of Kayakalp Score Trends and Award Allocation in District Hospitals of Uttar Pradesh (2019-2023): Analyzing the Impact on Healthcare Standards and Infrastructure	Dr. Rimmy Devi, Dr. R. Harsvardhan, Dr. Saurabh Singh, Dr. Anmol Jain

Title for Poster Presentation

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2.	Compliance and Perceptions of Risk Among Biomedical Waste Handlers: A Mixed-Methods Observational Study at a Common Biomedical Waste Treatment Facility in Punjab	Dr. Sumreen Bhatia, Dr Seep Sonali
3.	Zero Waste Hospitals: A Systematic Examination of Circular Economy Principles in Biomedical Waste Management	Latit Mohan Sharma, Dr. Seep Sonali
4.	A study on Hospital acquired infection in ICU and HDU of a tertiary care government hospital	Dr. Nabila Asif, Dr Himanshu Reddy, Dr Geeta Yadav, Dr Sheetal Verma
5.	Intervention to improve the steps in Biomedical waste Management related to category A (Human Anatomical waste-amputated limbs) in the pre-identified area of the King George's Medical University (KGMU), Lucknow, Uttar Pradesh, India.	Dr. Aprajita Jaiswal, Prof D. Himanshu, Prof Kirti Srivastava, Dr. Devarshi Rastogi, Anuj Singh
6.	E-waste Management: Awareness, attitude, and practices among Medical Students in the state of UP, India.	Dr. Anubhav Agarwal, Dr. Reema Kumari
7.	Risk Management in Secondary Care District Hospital at Lucknow	Dr Umesh Dhar Dubey, Dr. Nitin Dutt Bhardwaj, Brig. (Dr.) Pradeep Srivastava, Dr. A. S. Tripathi, Dr. Sairaj Chodankar, Dr. Anmol Jain, Dr Shallu Yadav, Mr. Dhananjay Pratap
8.	Psychological Impact of Needle Stick Injury: A Descriptive Study of a Tertiary Care Hospital in India	Dr. Mahwish Suhaib, Dr R Hrashvardhan, Dr Saurabh Singh, Dr Romil Saini, Dr Anmol Jain, Dr Abhishek Singh
9.	Legal Aspects of Biomedical Waste -A Review	Dr. Swati Choudhary, Dr. R. Harsvardhan
10	Exploring Sustainable Wealth Generation through Waste Recycling: A Case Study of a Tertiary Healthcare Teaching Institute in Northern India	Harshit Verma, Harsvardhan R, Marak S Rungamai, Jha Gaurav, , Mitra Amarjeet
11.	A study on Reducing Needle Stick Injuries and the Impact of Hepatitis B Vaccination Campaign among Healthcare Workers in a Tertiary Care Hospital in Northern India	Dr. Swati Srivastava, Dr. R. Harsvardhan, Dr. Saurabh Singh, Dr. Kris Agarwal, Mr. Dhikhil C.D., Mr. Manu Thambi
12.	Comparison of mCIM, eCIM, Immuno-chromatographic assay and Multiplex Real Time PCR for detection of Carbapenem Resistant Klebsiella pneumonia	Dr. Prashant Gupta, Priyamvada Saxena, Dr Raj Kumar Kalyan, Dr. Sheetal Verma, Huma Jamal, Dr Venkatesh, Dr. D. Himanshu
13.	Title-Knowledge, Attitude and Practices about Needle Prick Injury and Postexposure Prophylaxis in Health Workers: A Tertiary Center Experience	Dr. Umang Sharma, Munna Lal Patel, Rekha Sachan