

Analysis of biomedical waste management case laws: an Indian perspective vs. European guidelines

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Received: 13.08.2024

Revised: 16.09.2024

Accepted: 19.10.2024

ABSTRACT

Background: The handling, treatment, and disposal of biological waste produced by healthcare facilities are regulated by a distinct set of laws and regulations aimed at ensuring safety and efficacy. Conducting a systematic review of case laws for biomedical waste management is essential for understanding the Legal Precedents.

Methods: Systematic review was conducted using PRISMA guidelines for the case laws related to biomedical waste management for non-compliance with existing rules using the legal search engine www.indiankanoon.org and summarized using www.casemine.com, the findings were provided in a summary of table for each outcome and synthesised qualitatively. A literature review was conducted using existing articles on Biomedical Waste Management in European countries.

Results: A total of 604 records were retrieved, of which 556 were selected from 2012 to 2024. Among these, 26 relevant case records were selected for full screening. The Results are summarized in tabular form and elaborated in four columns: case laws, facts, issues and decision.

Conclusion: This study shows the need for periodic surveillance of institutions handling biomedical waste for compliance in the interest of community well-being. In European countries it can be observed that guidelines are strictly followed and there are minimal requirements of intervention by law.

Keywords: Biomedical Waste, Biomedical Waste Management 2016, Biomedical Waste Management Rules, Case Laws, Biomedical, Healthcare, European guidelines, Healthcare without Harm Europe

INTRODUCTION

Biomedical waste management in India is governed by a specific set of laws and regulations designed to ensure treatment, effective handling, safe treatment, and disposal of biomedical waste generated by healthcare facilities. The legal framework aims to mitigate the risks posed by biomedical waste to health and the environment.

The healthcare industry is encouraged to adopt sustainable practices under European guidelines for the handling of biomedical waste. Reducing trash generation, gradually ceasing incineration, striving for a toxic-free future, and safeguarding waste management personnel are important goals. If appropriately separated from hazardous trash at the time of creation, a sizable amount of healthcare waste is non-hazardous and recyclable(27).

Challenges and Enforcement

Infrastructure and Capacity: Many healthcare facilities lack the infrastructure needed to properly handle biomedical waste, particularly those located in rural locations.

Compliance and Monitoring: There are challenges in ensuring consistent compliance with the rules due to inadequate monitoring and enforcement by regulatory bodies.

Awareness and Training: Healthcare personnel need to be better educated and trained on appropriate biomedical waste management procedures.

Conducting a systematic review of case laws for biomedical waste management is essential for several reasons

1. Understanding Legal Precedents

- **Clarification of Legal Standards:** A systematic review helps to clarify the legal standards and principles established by various courts, providing a comprehensive understanding of how laws are interpreted and applied.
- **Consistency in Application:** It is feasible to find trends and consistency in court rulings by examining a large number of cases. This can guarantee that similar situations are handled similarly, thus promoting justice and predictability in the legal system.

2. Identifying Gaps and Inconsistencies

- **Highlighting Inconsistencies:** A thorough review can reveal inconsistencies or contradictions in case law, highlighting areas where the law may need clarification or reform.
- **Addressing Legal Gaps:** It helps in identifying gaps where existing laws might be inadequate or silent, prompting legislative or judicial action to address these deficiencies.

3. Informing Policy and Practice

- **Policy Development:** Insights gained from case law reviews can inform policymakers about the effectiveness of current regulations and the need for new policies or amendments to existing laws.
- **Best Practices:** Healthcare facilities and waste management entities can use the findings to align their practices with legal requirements and best practices, as interpreted by the courts.

4. Enhancing Compliance and Enforcement:

- **Guidance for Enforcement Agencies:** A systematic review provides enforcement agencies with a clear understanding of legal requirements and judicial expectations, aiding more effective oversight and enforcement.
- **Improving Compliance:** By understanding the legal ramifications of non-compliance, healthcare providers and waste management companies are more likely to adhere to regulations.

5. Supporting Legal Education and Research

- **Educational Resource:** A comprehensive review serves as a valuable educational resource for legal professionals, students, and researchers, providing a detailed compilation of the relevant case laws and legal principles.
- **Research Foundation:** This study establishes a foundation for future scholarly and applied studies in the area of legal biomedical waste management.

6. Protecting Public Health and Environment

- **Ensuring Effective Management:** Stakeholders can more effectively guarantee that biomedical waste is managed in a manner that safeguards the environment and public health by being aware of how regulations are applied and understood.
- **Reducing Legal Risks:** Healthcare providers and waste management companies can mitigate legal risks by adhering to best practices derived from case law analyses.

Objective

To study the case laws related to the Bio-medical Waste Management Act 1998 and its amendments through a Systematic Review using the PRISMA guidelines and comparison with the European guidelines.

METHODOLOGY

This Systematic review was conducted for case laws related to biomedical waste management between 2012 and 2024 which involves non-compliance with existing rules.

The literature review was conducted existing articles related to biomedical waste management in European countries.

Search Strategy

This systematic review aims to answer the following questions:

- How have courts interpreted biomedical waste management laws?
- What are the common legal challenges and outcomes in biomedical waste management cases?
- How do European guidelines for biomedical waste management promote sustainability and worker safety?
- What challenges do healthcare facilities face in implementing these guidelines compared with practices in other regions?

Electronic searches

The Indian Case laws were collected from the legal search engine www.indiankanoon.org, and summarized using www.casemine.com.

Articles were obtained from the Scopus and ResearchGate for a systematic review of European standards.

Data synthesis: The findings from systematic reviews were provided in a summary of the findings table for each outcome, and the data were synthesized qualitatively.

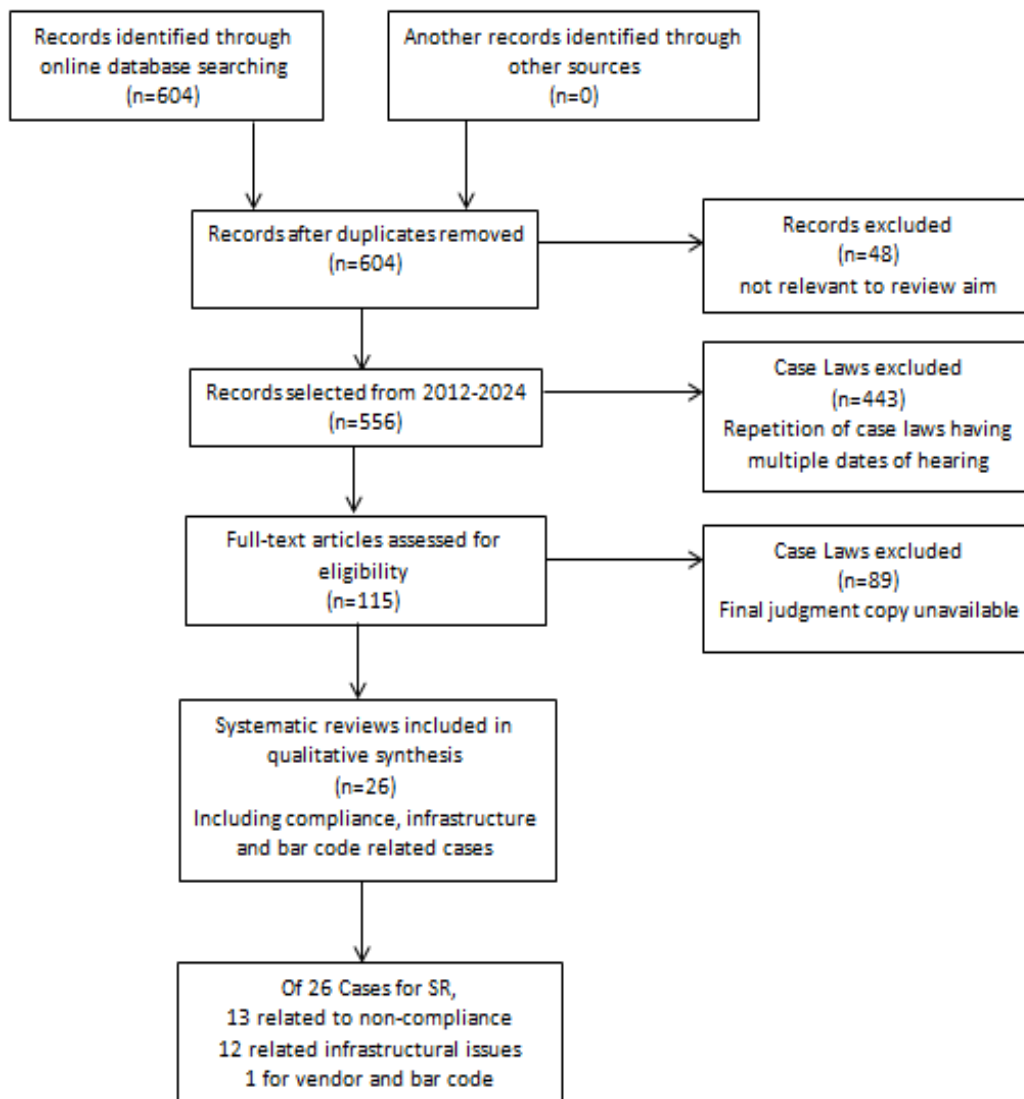


Fig 1: Flow Chart of Systematic Review

RESULTS

The search retrieved 604 records, of which 556 were selected from 2012 to 2024. Among these, 26 relevant case records were selected for full screening. Thirteen cases were identified as non-compliant with the Biomedical Waste Management guidelines, and 12 were identified as infrastructure and establishment related cases. One case regarding the importance of the bar code and labeling was identified and screened separately. The Results are summarized in tabular form and elaborated in four columns: case laws, facts, issues and court decisions. The results highlight the importance of adherence to Biomedical Waste Management guidelines and the actions taken by the Central and State Pollution Control Boards in all cases.

Table 1: Depicting the RoL

Case Law	Facts	Issues	Decision
1. Prabhat Mohan Pandey vs Union of India 2024(2)	The case pertains to the 2016 BMW Guidelines and issues related to the grant of consent to new units beyond a 75 km radius. The Principal Secretary of the Department of Environment cannot	The study investigates the availability of an alternative statutory remedy for challenging orders, whether the appeal under Section 28 of the Water Act is illusory, and	The petitioner can seek the National Green Tribunal after completing the Water Act's remedies. The court did not comment on the case's merits, leaving it to the appellate authority to address the issues.

	act as an appellate authority against his own order passed as Chairman of the Board.	if Section 5A of the EP Act is available.	
2. Ms Hlg Memorial Hospital Pvt Ltd vs West Bengal Pollution Control Board on 9 October 2023(3)	The hospital was found to have inadequate biomedical waste storage, improper waste management, and staff training issues, but denied these allegations and violated the Bio-medical Waste Management Rules, 2016 without consent.	The Bio-medical Waste Management Rules, 2016 and subsequent amendments are in violation due to failure to maintain proper records, construction without consent, and lack of ETP setup. The rules cover the operator's duties, segregation, packaging, transportation, and storage of biomedical waste.	The National Green Tribunal upheld the West Bengal Pollution Control Board's findings on Ms Hlg Memorial Hospital Pvt Ltd's violations of the Bio-medical Waste Management Rules, 2016, citing the hospital's failure to comply with BMW storage, record-keeping, and construction regulations without consent.
3. Meenava Thanthai K.R.Selvaraj Kumar vs. State Of Tamil Nadu August 31, 2023(4)	A medical college and hospital is accused of improperly disposing of biomedical waste and constructing buildings without Environmental Clearance. The hospital disposes of 520 kg/day of waste and treats 300 KLD and 60 KLD of sewage in separate plants. The Pollution Control Board has not received an annual report.	The 4th respondent improperly disposed of biomedical waste without Environmental Clearance, failed to comply with Biomedical Waste Management Rules, and had no authorization or annual reporting to the Pollution Control Board.	The respondent was found to have violated environmental regulations, including improper biomedical waste disposal and construction without clearances. Compensation has been imposed, and the court has directed the Pollution Control Board and State Environment Impact Assessment Authority to ensure compliance.
Case	Facts	Issues	Decision
4. Udho Prasad Sharma vs Central Pollution Control Board on 29 July 2022(5)	The Bio-Medical Waste Rules, 2016 are under scrutiny for non-compliance, with gaps in authorizations, segregation, treatment, and disposal. The Tribunal emphasized the need for a consolidated status report and monthly monitoring. Bio-medical waste generation is significant, with varying treatment levels and some states not filing revised action plans.	The Bio-Medical Waste Rules, 2016, lack of compliance, inadequate monitoring infrastructure, insufficient implementation of barcode system, radioactive material disposal, and pollution challenges in hospitals are major issues.	The NGT has identified significant gaps in compliance with the Bio-Medical Waste Rules, 2016, requiring urgent actions to improve waste management. Recommendations include enhancing monitoring, enforcement, and infrastructure. The NGT has dismissed the application and forwarded the order to relevant authorities.
5. M/S Rainbow Environments Pvt. Ltd vs Department Of Science & Technology on 15 December, 2022(6)	The Appellate Authority ruled that Meridian Milieu Care Pvt. Ltd., which was operating in the same area as the applicant, was not illegally allowed to operate due to a court stay. The Central Pollution Control Board issued guidelines for Bio Medical Waste Rules, but the applicant's facility was closed in 2021 for violating the rules, operating over 150 km without proper authorization.	Legality of setting up new CBMWTFs without conducting gap analysis. Compliance of 2016 guidelines for CBMWTFs. Violations of BMW Rules by the applicant's facility.	The Punjab Pollution Control Board's 2020 EOI for new Central Blue Ribbon Water Treatment Facilities (CBMWTFs) was deemed violative of 2016 guidelines and dismissed. The Tribunal directed State Pollution Control Boards to reassess infrastructure and take remedial action. The application was dismissed under Sections 14 and 15 of the NGT Act, emphasizing the importance of compliance with BMW Rules.
6. Suomoto Scientific Disposal Of Bio vs Coram Hon'Ble Mr Justice Adarsh Kumar on 18 January 2021(7)	The BMW Management Rules, 2016 only authorize 1.1 lakh out of 2.7 lakh Healthcare Facilities, prompting State Pollution Control Boards to address compliance gaps and prevent unscientific biomedical waste disposal. The Central Pollution Control Board has tracked COVID-19 biomedical waste generation, collection, and	The BMW Rules, 2016 are being enforced for the disposal of biomedical waste related to COVID-19 treatment, with the aim of preventing unscientific disposal, developing standard protocols, and exploring COVID waste conversion into clean energy.	The court accepted a report and directed Uttar Pradesh authorities to take necessary actions, with all States/Union Territories following up on the recommendations and compliance measures, with national-level monitoring overseen by the CPCB. The application was dismissed, and copies were sent to Chief Secretaries for compliance.

	disposal		
7. Meera Shukla vs Municipal Corporation Gorakhpur on 12 January 2021(8)	The case involves pollution in Ramgarh Lake and the Ami, Rapti, and Rohani Rivers in District Gorakhpur due to untreated sewage and industrial effluents. The Tribunal directed authorities to address pollution, including closing polluting activities and enforcing the "polluter pays principle." The Supreme Court dismissed the State of Uttar Pradesh's appeal. Reports show violations in waste management and non-compliance by distillery and sugar units.	Untreated sewage and industrial effluents pollute water bodies, leading to wetlands, encroachments, and environmental violations. Non-compliance with regulations, lack of action by departments, and failure to implement STPs and CETPs are also issues.	The Tribunal ordered authorities to address pollution issues and submit reports, dismissing the State of UP's appeal. Committees were instructed to prepare action plans. The case of Meera Shukla vs. Municipal Corporation Gorakhpur highlighted severe environmental issues, including water pollution and non-compliance with regulations. Concrete steps are needed for public health protection.
8. Amitkumar Pravinsagar Nayak vs Ahmedabad Municipal Corporation on 17 September, 2021(9)	The petitioner is requesting a fresh tender for Bio-Medical Waste Management, arguing that the AMC awarded contracts through renewal instead of a fresh tender, failing to incorporate new terms and conditions of the Rules, 2016. The petitioner seeks a stay on the contract award pending the admission, hearing, and final disposal of the petition.	The renewal of Bio-Medical Waste Management contracts without a fresh tender and compliance with the Bio-Medical Waste Management Rules, 2016, and whether respondent companies breached contractual obligations.	The court deems no further directions needed and requires all parties to follow the Rules, 2016 and any future regulations for controlling bio-medical waste generated by hospitals. The court will take note of non-adherence to the rules and regulations if they are deemed non-compliance in the future.
9. Dr J Umarani vs The State Of Tamil Nadu on 5 August 2019(10)	Dr. J. Umarani filed a Writ Petition in India, claiming the Bio-Medical Waste Management Rules, 1998, are not being effectively implemented in Tamil Nadu. He argued that the rules are misunderstood, limiting their application to discarded waste and failing to address broader waste management.	The study examines the implementation of the Bio-Medical Waste Management Rules, 2016, the misinterpretation of these rules by state authorities, and the compliance of chemical liquid waste handling.	Dr. J. Umarani v. Tamil Nadu is a case involving bio-medical waste management rules and alleged misinterpretation by authorities. The High Court will assess compliance and determine appropriate action to address waste management shortcomings.
10. R Kalyanaraman vs The Secretary To Government on 25 October 2018(11)	R. Kalyanaraman filed a writ petition for a Writ of Mandamus to remove illegally dumped bio-medical waste in Vallanadu Wildlife Sanctuary, alleging it was illegally imported from foreign countries. The Sub Divisional Magistrate and Sub Collector of Tuticorin directed the Inspector of Police to investigate and file an FIR. The investigation is ongoing to identify the culprits.	Illegal waste dumping in Vallanadu Wildlife Sanctuary, allegations of illegal bio-medical waste importation, and compliance with the Environment (Protection) Act, 1986 and Bio-Medical Waste Management Rules, 2016.	The investigation confirmed that the dumped materials were plastic waste, not bio-medical waste, and the case is still under investigation to identify the responsible individuals. This case underscores the need for proper waste management and environmental concerns.
11. Rahul Vijay Singh Chugh vs State Of Haryana Others on 16 August 2012(12)	The petition reveals hospitals and nursing homes' non-compliance with the Bio-Medical Waste Management and Handling Rules, 1998, with pollution control boards in Punjab and Haryana failing to supervise, and four hospitals facing notices.	Hospitals and nursing homes in Punjab, Haryana, and Chandigarh are reportedly not adhering to the Bio-Medical Waste Management and Handling Rules, 1998.	The Pollution Control Boards of Punjab and Haryana and the Pollution Control Committee of Union Territory Chandigarh have been instructed to enforce strict compliance with the Bio-Medical Waste Management and Handling Rules, 1998, and to take immediate action in case of violations.
12. Uttarsanda Gram Panchayat 3 vs State Of Gujarat 4 on 21 September	The petitioner opposed a medical waste incinerator near residential areas due to potential environmental and health hazards.	The study investigates the environmental and health risks of a medical waste incinerator in residential	The High Court dismissed the petitioner's grievance and ordered the District Collector to reconsider, emphasizing the significance of

2017(13)	The Collector granted permission, but the High Court dismissed the grievance. The District Collector was directed to reconsider. The court emphasized environmentally benign actions and precautionary principles.	areas, whether authorities followed biomedical waste management guidelines, the petitioner's objections to the location, and the effectiveness of GPCB's pollution control measures.	biomedical waste treatment guidelines, environmentally friendly actions, and the right to a clean environment as fundamental Indian Constitution rights.
13. Jharkhand Human Rights Confere vs State of Jharkhand Ors on 24 July 2015(14)	Six specialized vans collect Bio-Medical Waste from towns' lanes and sub-lanes. By July 16, 2015, the Board must provide incinerator details. Municipal Commissioner Sri Prashant Kumar proposes a seminar/workshop to raise awareness, educate, implement, and register. Waste segregation is crucial, and chlorinated plastic waste bags are prohibited. Jharkhand State Pollution Control Board faces staff shortage.	The Jharkhand State Pollution Control Board faces staff shortages, limited post creation, and the need for waste management awareness seminars/workshops.	The Jharkhand State Pollution Control Board faces staff shortages, post creation limitations, and the need for waste management awareness seminars. The case underscores the importance of Bio-Medical Waste management and the challenges it faces in fulfilling its responsibilities.

Table 2: Infrastructure related reviews

Case Law	Facts	Issues	Decision
1. Shree Nath Sharma vs Union Of India on 17 January 2023	District Environment Plans have been prepared in 220 out of 739 districts, but 351 river stretches are polluted and over 3000 dump sites with legacy waste remain unremediated. Recommendations include solid waste segregation, composting, landfill locations, biomedical waste management, and water quality management.	The issue is primarily due to inadequate environmental regulations, inadequate waste management practices, and failure to meet deadlines and address environmental plan gaps.	The Tribunal's recommendations emphasize the need for efficient waste management, environmental regulations, and timely action to address environmental challenges, promote sustainable development, and utilize treated wastewater.
2. Eco Med Solutions Through Its Partner vs Madhya Pradesh State Environment on 29 November 2022(15)	The appellant challenged the establishment and operation of a Common Bio-medical Waste Treatment Facility (CBWTF) by the Respondent, citing violation of siting guidelines issued by the Central Pollution Control Board in 2016. The Respondents contested the Appellant's claims, arguing that the CBWTF was compliant with environmental rules. The Tribunal directed the Madhya Pradesh Pollution Control Board to visit the site and submit a report.	Whether the establishment of the CBWTF violated CPCB guidelines regarding siting criteria. Whether the CBWTF had obtained necessary consents and authorizations for its operation.	The Tribunal ruled that the CBWTF was established and operated without illegality or irregularity. The appeal was dismissed, and the State Pollution Control Board was directed to ensure compliance with the consent order. The Tribunal upheld the legality of the CBWTF's operation, confirming compliance with environmental rules and no violations reported by the Appellant.

3. Dharmendra Gayakwad vs. Madhya Pradesh Industrial Development August 23, 2022(16)	JRR Waste Management Private Limited, Agra, is proposing to establish a Common Bio-Medical Waste Treatment Facility in the Malanpur-Ghirongi industrial area, District Bhind, M.P. The proposal is pending before the MP State Environment Impact Assessment Authority. The Gwalior region has experienced a 6.28% annual increase in hospital beds and 23.75% annual increase in bio-medical waste.	The issue pertains to the non-compliance with the Bio-Medical Waste Management Rules, 2016 and the 2nd Amendment Rules, 2019, specifically concerning the establishment of a new CBWTF in the Gwalior region	The Gwalior region is establishing a new CBWTF to manage bio-medical waste and comply with environmental regulations. The facility in Malanpur-Ghirongi aligns with CPCB guidelines, ensuring timely response to any violations to maintain environmental standards and public health.
4. D Swamy vs Karnataka State Pollution Control on 22 September 2022(17)	The Karnataka State Environment Appellate Authority granted an interim stay on the establishment of a Common Bio-Medical Waste Treatment Facility for Respondent No.3, which was later dismissed. The National Green Tribunal dismissed the appeal, and a Division Bench of the Madras High Court admitted a Writ Petition and stayed a memorandum related to the facility.	The appeal's dismissal is pending, and ex post facto Environmental Clearance is permissible under the Environment Protection Act. Closing the Bio-Medical Waste Treatment Facility without prior EC is against public interest.	The National Green Tribunal upheld the operation of the Bio-Medical Waste Treatment Facility, despite the lack of prior Environmental Clearance, stating that ex post facto EC should only be granted in exceptional circumstances, considering environmental factors. The closure of the facility would not be in the public interest, and the Ministry of Environment, Forest and Climate Change has the authority to issue pollution control directions.
5. M S E Tech Projects Private Limited vs State Of Chhattisgarh on 23 March 2018(18)	The petitioner contested the establishment of a Common Biomedical Waste Treatment Facility in Chhattisgarh, arguing that the guidelines were unenforceable and inefficient. The National Green Tribunal highlighted the need for additional facilities and requested permission to close the facility.	The text questions the statutory force of Central Pollution Control Board guidelines, the justification for consent to establish a CBWTF, and the delay in petitioner's actions, and whether third party rights were created during this delay.	The court ruled in favor of the State of Chhattisgarh, upholding the legality of the consent granted for the establishment of the CBWTF and dismissing the petitioner's claims regarding the guidelines and non-compliance issues
6. M S Ramky Energy And Environment Ltd vs The District Collector on 10 November 2017(19)	The petitioner, a registered company under the Companies Act, 1956, has established facilities for Bio-Medical Waste Management in Undurmikidakulam Village, Mukkulam, Tiruchuli Taluk, Virudhunagar District. The facility collects, receives, stores, and disposes of bio-medical waste from hospitals and dispensaries in various districts, following the Biomedical Waste (Management and Handling) Rules of 2016.	The petitioner established Bio-Medical Waste Management facilities in 2017 and 2013 to address threats from locals. The court found a prima facie case in favor, but the Additional Government Pleader couldn't identify violations. The petitioner must obtain consent from a fourth respondent before operating the facility.	The court granted police protection to the petitioner for their Bio-Medical Waste Management facilities, directing authorities to ensure safety and compliance with legal requirements for industrial operations.
7. G J Multiclave India Pvt Ltd Sy vs The State Of Telangana Rep By Its on 1 September 2017(20)	Petitioners, a Hyderabad-based company operating a Common Bio Medical Waste Management Facility, faced restrictions from the TSPCB due to the 2016 Bio Medical Waste Management Rules, raising a dispute over the authority to demarcate such areas.	The Telangana State Pollution Control Board's May 28, 2016 order restricting bio-medical waste management operations is questioned for being arbitrary, illegal, violating natural justice principles, without jurisdiction, and contrary to the Bio Medical Waste Management Rules,	The case underscores the significance of regulatory bodies adhering to statutory powers, procedures, clear delegation of powers, and legal principles in administrative decisions, allowing Writ Petitions and closing Miscellaneous Petitions.

		2016	
8. Smti Niva Marak And Ors vs The State Of Meghalaya And Ors on 24 July 2014(21)	The petitioners, who have lived on a land for generations, challenged a notice from the Tura Civil Hospital Superintendent to vacate it. The State respondents claimed they were illegal occupants and encroachers on the land, which was settled by the Garo Hills Autonomous District Council. The State denied the Akhing Nokma had any right over the land.	The court is examining the authority of Tura Civil Hospital's superintendent to issue a notice for petitioners to vacate the land, whether they are illegal occupants and if the land was rightfully transferred.	The State respondents claimed the land was settled for Tura Civil Hospital and the petitioners were illegal occupants. They directed them to address bio-medical waste management, including commissioning and operating an incinerator in accordance with the Bio-medical Waste Rules, 1998.
9. Ilaben Pathak vs State Of Gujarat on 30 April 2013(22)	The Ahmedabad Municipal Corporation has submitted a report highlighting unhygienic conditions at the Civil Hospital during the 2012 monsoon, including blocked gutters, poor hostel maintenance, and inadequate mosquito control. Recommendations include complaint documentation, sanitation promotion, public health unit establishment, drainage system redesign, and public awareness.	The text questions whether the conditions at Civil Hospital and other Government hospitals raise legal issues regarding the interpretation of the Constitution of India, 1950, and whether Committee recommendations are necessary and enforceable.	The Court acknowledged the severity of issues at the Civil Hospital and other Government hospitals, emphasizing the need for prompt measures to address unsanitary conditions and prevent disease spread, and directed strict compliance with Committee recommendations.
10. Synergy Waste Management Pvt Ltd vs Union Of India Ors on 15 January 2013(23)	The Central Pollution Control Board established the Common Bio-medical Waste Treatment Facility in 2006 near Sukhdev Vihar, Delhi, which collected, transported, and treated bio-medical waste for free. However, concerns about environmental violations led to its relocation to Okhla, causing health issues.	The bio-medical waste treatment facility near Sukhdev Vihar is under scrutiny for environmental and health risks, and whether it should be relocated as per guidelines and public interest.	The Court ruled that living in a pollution-free environment is a fundamental right under Article 21 of the Constitution. The facility near Sukhdev Vihar posed risks to public health and the environment, and the Government of NCT of Delhi and Synergy Waste Management were directed to relocate.
11. Sms Water Grace Bmw Pvt Ltd vs Govt Of Nct Of Delhi Directorate Of on 13 December 2021(24)	The petitioner bid for a project to transport and treat bio-medical waste from hospitals and dispensaries under the NCT of Delhi, but the DPCC refused to grant consent. The dispute was arbitrarily resolved, with the respondent demanding compensation for extra land use and waste collection.	The arbitration award's validity is questioned, as it may be vitiated by patent illegality, and the arbitral tribunal's reasonable interpretation of Clause 10 of the Agreement is also considered.	The Arbitral Tribunal is the final authority for contract interpretation, and its decision should not be interfered with unless a jurisdictional error is proven. The Court cited precedents to support the arbitrator's binding interpretation, and the High Court's interference was deemed unwarranted.
12. M S Safenvron Unitii vs State Of Andhra Pradesh on 7 August 2019(25)	The petitioner, operating a Biomedical Waste Treatment Facility, sought consent to establish a second facility in Krishna District. However, the second respondent granted in-principle permission to another entity, leading to a dispute over the capacity and compliance of the existing facility. The petitioner contested the legality of the permission.	The issue involves the validity of permission for a second CBWTF, compliance with existing guidelines and capacity requirements, and a dispute over healthcare facility coverage area and bed strength.	The court ruled the second CBWTF's permission illegal due to statutory inconsistencies and healthcare facility coverage area inconsistencies, emphasizing the need for environmental compliance and accurate data in biomedical waste management.

Table 3: Reviews related to other BWM issues

Case	Facts	Issues	Decision
Dma Nursing Home Medical vs Delhi Pollution Control Committee Ors on 6 May 2020(26)	The plaintiff claims that Butterfly Softwares LLP and Clean Code Solutions LLP have created a monopoly in Delhi, leading to financial prejudice for healthcare facilities, as they provided software, data storage services, and barcode stickers for the Bar Code System.	The debate revolves around the public interest violation of Butterfly and Clean Code's monopoly on Bar Code or QR Code labels and whether the restriction on vendor numbers should be maintained.	The court rejected the plaintiff's request for a stay, stating that the restriction on vendors for procuring Bar Code/QR Code stickers was in the public interest and not warranting judicial intervention.

DISCUSSION

Considering these results, it was observed that in most cases the court of law or the tribunal is not directly involved in the punishment, but it allows the authority to take appropriate actions as per the guidelines and with strict adherence to compliance(3). It is noted that in certain cases, authorities such as the Pollution Control Board did not take decisions according to the guidelines, in which case the court intervened and directed the concerned authorities for strict adherence to guidelines(4). In a few cases related to the establishment of the Common Biomedical Waste Management Treatment Facility, gap analysis and need analysis were performed by authorities with strict adherence to guidelines.

The court dismissed an appeal from the hospital side, imposing a penalty of INR 2,00,000/- and directing appellants to execute a bank guarantee of INR 5,00,000/-. The case was disposed to review the amount of compensation by the Pollution Control Board and to take necessary actions to ensure compliance(3). The court's directives aim to address the existing gaps in waste management practices and promote the adoption of innovative solutions for treatment and biomedical waste disposal(6).

The court ordered authorities to conduct periodic inspections of health institutions and district and hospital level committees, and submit reports to authorities. The defects pointed out by the respective committees should be addressed and rectified by health institutions(10).

The case dismissed allegations of illegal importation of BMW and highlighted the importance of proper waste management and thorough investigation(11). The court ordered authorities to monitor compliance and take immediate action in case of violations(12). The court also highlighted the right to a clean environment and sustainable development as fundamental rights under the Indian Constitution.

The Tribunal emphasized the importance of timely compliance with environmental regulations for sustainable development and environmental protection. It found no merit in the Appellant's claims of guideline violations and upheld the legality of the CBWTF's operations(15). The Tribunal emphasized the need for public interest and environmental factors in these cases, and the appeal was dismissed by the NGT. The Petition was dismissed and consent to establish a CBWTF was granted as BMW management guidelines were being followed(18). Police Protection applications have been approved to ensure safety(19). A writ petition was allowed, as the TSPCB impugned order violated the petitioners' fundamental rights(20). The court emphasized the need for prompt and effective measures to prevent disease spread and directed strict compliance with the committee's recommendations(22). The decision was made to shift the BMW treatment facility to a suitable site away from the residential areas(23).

The case b/w DMA Nursing Home vs Delhi Pollution Control Committee highlights the importance of compliance with BMW rules in the bar code labeling system. However procurement from vendors is not under these guidelines(26).

Another study showed that biological waste is properly managed in Romanian hospitals, with trash being separated and stored in accordance with the regulations. Authorized sanitary facilities were used for temporary storage, with a maximum storage period of 72 h. Before disposal storage for 48 h, decontamination was completed. Licensed businesses handle transport. Three months later, there was a 17% decrease in non-hazardous garbage, with 67% recycled.(27).The operation of the biomedical waste management system should be routinely revised in accordance with situational changes, subsequent to an examination of hospital management.

According to a different study, appropriate healthcare waste management (HCWM) can prevent HIV/AIDS, sepsis, and the spread of hepatitis from contaminated needles, as well as limit infections and population exposure to resistant bacteria. Adequate hand hygiene management averts illicit repackaging, tainted needles, and long-term health consequences of harmful materials(28).

CONCLUSION

The study emphasizes the importance of having a strong monitoring system in place so that real-time tracking of the efficacy of Biomedical Waste Management Guidelines can be achieved. In addition to routine inspections, this would entail the incorporation of cutting-edge technologies such as GPS-enabled waste transport truck tracking systems and real-time data logging for trash disposal activities.

Furthermore, it is crucial to hold training sessions on a regular basis for staff members engaged in waste management to keep them informed about the most recent standards and best practices. The study also emphasizes the necessity of an open reporting system in which organizations that manage biomedical waste must regularly provide the Pollution Control Board with compliance reports.

In addition, it is imperative to enforce penalties for non-compliance to discourage any deviations from norms. According to the study, implementing a system of rewards for establishments that regularly abide by rules may also promote improved procedures throughout the industry. This paper promotes the constant development of policies and regulations to solve new issues in biomedical waste management by taking lessons from worldwide best practices, especially from European models where strict adherence is combined with cutting-edge waste management technologies.

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