

Table S1. Studies excluded from the review and reasons for their exclusion.

Authors	Title of the paper	Reason for exclusion	Methology	Results
Chin et al. 2000 [36]	The environmental effects of dental amalgam	Review	No info	The primary contributor to the environmental impact of dental mercury is dental amalgam waste. Implementing regulations for the proper collection of mercury-contaminated solid waste, particularly extracted teeth with amalgam fillings, can prevent the release of mercury vapor during combustion.
Ozbek et al. 2004 [37]	A study of the dental solid waste produced in a school of dentistry in Turkey.	No measurement of DSW	Solid waste was sampled from each clinic at Hacettepe School of Dentistry on one day in April and one day in May of 2002 in order to assess the composition of solid waste and investigate solid waste management practices.	At Hacettepe University School of Dentistry, hazardous waste collection rules are predominantly adhered to, given that only a minor portion of the waste generated is classified as hazardous.
Tzoutzas et al. 2004 [38]	The disposal of solid dental waste in the Dental School of the University of Athens	Review	No info	The dental clinics affiliated with the National and Kapodistrian University of Athens generate substantial amounts of both solid and liquid waste daily.
Kizlary et al. 2005 [26]	Composition and production rate of dental solid waste in Xanthi, Greece: variability among dentist groups.	No reporting of W/W% composition of DSW	A study was conducted to determine the composition and production rates of dental solid waste produced by dental practices in the Prefecture of Xanthi. The study involved 22 private dental practices and one public dental practice. From 20 May to 27 June 2002, 22 working days were used for waste collection.	Dental practices' solid waste was systematically classified into three primary categories: a staggering 94.7% constituted infectious and potentially infectious waste, while non-infectious waste represented a mere 2.0%. Domestic-type waste rounded out the categories, amounting to 3.3% of the overall waste generated.

Nazar et al. 2005 [39]	Dental waste management in municipal health clinics in Belo Horizonte, Brazil	Language rejected	A total of 54 municipal health clinics in the city that offer dental care were surveyed for information. Based on the requirements outlined in the Belo Horizonte Health Waste Management Manual, the clinic manager, one dental assistant, and one general assistant at each clinic were interviewed.	A concerning absence of waste management plans was noted in all surveyed clinics, signifying a critical gap in healthcare waste disposal strategies. Despite this, clinics, on average, generated a substantial 270 liters of solid waste per day. Notably, compliance was observed only in specific areas, such as the segregation of needles and mercury, provision of suitable cardboard containers for cutting and piercing items, and the daily internal collection and transportation of wastes.
Kontogianni et al. 2008 [40]	Investigating solid waste production and associated management practices in private dental units.	Survey by questionnaires	Structured questionnaires and interviews with dentists were used to quantify the waste produced.	A disconcerting observation reveals that in 2006, a staggering 80% of dentists in the municipality of Thessaloniki did not adhere to proper procedures for handling mercury-containing dental wastes. Additionally, less than 50% of practitioners managed metal-containing waste in alignment with international best management practices.
Sudhakar et al. 2008 [41]	Dental health care waste disposal among private dental practices in Bangalore City, India.	Unrelated topic by abstract rejected	Using a self-administered questionnaire, a cross-sectional study was conducted among 432 private dental practitioners in Bangalore City.	A concerning finding indicates that 64.3% of dentists do not engage in waste separation before disposal, with 47.6% resorting to handing over healthcare waste to street garbage collectors. Furthermore, 42.1% expressed dissatisfaction with the services provided by waste management agencies, while 16.9% identified ignorance as a primary obstacle to effective waste management.
Birpinar et al. 2009 [42]	Medical waste management in Turkey: A case study of Istanbul	Medical waste in hospital	Face-to-face interviews were conducted with 192 hospitals in Istanbul about the amount, collection, and temporary storage of medical waste.	Hospitals generate an approximate 22 tons of medical waste daily, with an average generation rate of 0.63 kilograms per bed-day. Recyclable materials are diligently collected separately at a commendable rate of 83%. Despite the consistent practice of waste separation, it is noteworthy that 25% of hospitals continue to use inappropriate containers for the collection of medical waste.
Muhamedagic et al. 2009 [43]	Dental office waste - public health and ecological risk.	Review	No info	Public safety and environmental apprehensions are on the rise regarding dental waste generated by dental clinics and offices. Dentists bear the responsibility and duty to ensure proper

				management of dental waste within their practices. The pressing issue of dental waste has emerged as one of the most urgent environmental concerns.
Vieira et al. 2009 [27]	Composition analysis of dental solid waste in Brazil.	No reporting of W/W% composition of DSW	From March to November 2007, waste samples were collected from three dental health services, including two public universities and one private university.	A breakdown of waste composition reveals that about 24.3% of the total waste is categorized as infectious or potentially infectious, while 48.1% is deemed non-infectious, and the remaining 27.6% is classified as domestic waste. It's noteworthy that the proportion of infectious waste seems elevated, potentially indicating misclassification issues with most wastes.
Mohamad et al. 2010 [44]	Composition and energy content of dental solid waste, Resources. Conservation and Recycling	No classification of DSW	Analyses of DSW samples were conducted in two major dental clinics in Jordan based on the composition and energy content of the samples.	Dental solid waste (DSW) primarily comprises combustibles, with over 80% consisting of paper and the remaining portion being plastic. Employing standard procedures and a bomb calorimeter, the energy content of DSW was determined to be approximately 24.0 MJ/kg, comparable to various other materials, indicating the potential for energy recovery.
Sunil Kumar et al. 2012 [45]	Biomedical waste management: A review	Review	No info	Many hospitals face challenges in waste disposal due to ineffective systems, impacting hygiene and sanitation. While disposable items reduce infection rates, they contribute to a surge in waste volume. Achieving effective waste disposal requires a holistic approach to waste management, integrated into hospital planning and design.
Avinash et al. 2014 [46]	Going green with eco-friendly dentistry.	Review	No info	A green dentistry approach utilizes advanced equipment to minimize the environmental footprint of dental practices, fostering a sustainable model. The article provides global dentists with practical 'green' recommendations to assume leadership roles in environmental stewardship.
Chartier et al. 2014 [28]	Safe management of wastes from health-care activities	Review	No info	Comprehensive guidance on safe waste management practices and access to unbiased healthcare information.
Rastogi et al. 2014 [47]	Green dentistry, a metamorphosis	Review	No info	Integrated dental innovations not only enhance patient care but also contribute to the principles of green dentistry. This approach results

	towards an eco-friendly dentistry: a short communication			in a reduction in supply costs, increased productivity, and minimized time wastage. Furthermore, the adoption of green dentistry practices helps prevent pollution, aligning with sustainable healthcare goals. Ultimately, the integration of these innovations not only benefits the environment but also leads to improved patient outcomes by reducing overall treatment costs while maintaining treatment quality.
Al-Qarni et al. 2016 [48]	Awareness of Eco-Friendly Dentistry among Dental Faculty and Students of King Khalid University, Saudi Arabia	Survey by questionnaires	A self-administered questionnaire was used to assess 160 participants' knowledge of eco-friendly dentistry. Following baseline data collection, a power point presentation was used to educate participants. Analyzing the post-intervention data followed.	Continuing education plays a pivotal role in increasing awareness and knowledge about eco-friendly dentistry. The study revealed statistically significant knowledge gains among participants following the educational intervention, underscoring the significance of ongoing learning in promoting environmentally conscious dental practices.
Richardson et al. 2016 [49]	What's in a bin: A case study of dental clinical waste composition and potential greenhouse gas emission savings	Review	An audit approach was used in this study to evaluate the sustainability potential of dental practice by evaluating the nature and quantity of dental clinical waste, and assessing the feasibility of calculating financial costs and carbon savings associated with dental clinical waste management.	Reducing carbon emissions and enhancing profitability in dental practices go hand in hand. The adoption of environmentally sustainable waste management practices hinges on both practical considerations and the presence of financial incentives to encourage their implementation.
Mulimani et al. 2017 [50]	Green dentistry: the art and science of sustainable practice.	Review	No info	Converting the concept of green dentistry into reality involves more than just clinical considerations. The article underscores the importance of incorporating social values, fostering community engagement, reaping economic benefits, formulating supportive policies, and showcasing leadership in the dental profession.

Rathakrishnan et al. 2017 [51]	Green dentistry: the future	Review	No info	The health sector can embrace environmentally friendly practices by incorporating fundamental measures. This includes enhancing hospital design, implementing sustainable waste management strategies, choosing products and chemicals with minimal environmental impact, and judiciously using natural resources like water and energy.
Harford et al. 2018 [52]	Sustainable Dentistry: How-to Guide for Dental Practices Sustainable Dentistry How to Guide for Dental Practices Sustainable Dentistry: How-to Guide for Dental Practices, Cent. Sustain	Review	No info	A dental sustainability guide is instrumental in furnishing effective recommendations for seamlessly transitioning to a more environmentally conscious status.
Phillipson 2018 [53]	The need for sustainable dentistry	Review	No info	Enhancing waste management and energy efficiency not only trims budgets and fortifies economies but also mitigates vulnerability to fluctuating oil prices through the adoption of green energy. By integrating environmental awareness into dental training, the industry can foster a heightened understanding of its ecological footprint, fostering increased demand for green products and sustainable practices.
Duane et al. 2019 [54]	Environmental sustainability and waste within the dental practice.	Review	In total, seven papers have been requested by colleagues to help them understand sustainability as it relates to dentistry.	This paper delves into waste management within the dental context, exploring how the dental team can exert influence over waste disposal and processing.
Hsu et al. 2019 [55]	Facilitating Green Supply Chain in	Irrelevant topic	Primary data were collected from 600 individuals throughout Taiwan	Kansei's healthscape model offers guidelines for crafting dental healthscapes to uphold positive client emotions and foster repeat

	Dental Care through Kansei Healthscape of Positive Emotions		in 2017 and 2018 using a questionnaire survey to assess Kansei and revisit intentions in healthscape scenarios.	visits. Through an emotion-centered approach, dental healthscapes can be designed to promote preventive care, early treatment, and efficient utilization of medical resources, thereby contributing to the establishment of green dentistry supply chains.
de Leon et al. 2020 [56]	Barriers to environmentally sustainable initiatives in oral health care clinical settings.	Review	PubMed, Web of Science/Clarivate, Google Scholar, CINAHL, and Ovid/MEDLINE were used for retrieving quantitative, qualitative, or mixed-method studies of environmental sustainability within the OHC clinical setting in Canada. A search of peer-reviewed open access articles published between January 2009 and November 2019 was restricted to English-language articles.	There are four primary barriers—infrastructure, institutional, educational, and individual—that hinder oral health care professionals from embracing environmental sustainability initiatives in the clinical setting.
Duane et al. 2020 [57]	Incorporating sustainability into assessment of oral health interventions.	Review	For assessing the health impact of this negative impact, disability-adjusted life years (DALY) are used.	The study revealed that, among toothbrush models assessed, those made from continuously recycled plastic demonstrated superior environmental sustainability compared to alternatives like bioplastic or bamboo.
Duane et al. 2020 [4]	Sustainability in Dentistry: A Multifaceted Approach Needed	Review	No info	Efforts to identify dental practices or products with a disproportionate environmental impact, employing life cycle analysis (LCA), serve as a critical step toward prioritizing areas for positive change. To enhance research capabilities, it is imperative to invest in training students and establishing dedicated sustainability centers, either virtually or physically. These initiatives should encompass a comprehensive analysis of single-use instruments, chemicals, and products, fostering a more sustainable trajectory for dental practices.

Mazur et al. 2020 [12]	How Dentistry is impacting the environment	Review	Utilize the 4R's concept (reduce, reuse, recycle, rethink) and switch to eco-friendly home oral hygiene products to reduce its environmental impact.	Advocating for a paradigm shift, toothbrushes, and floss, currently reliant on single-use disposable plastics, merit consideration for future prohibition. The urgency of transitioning away from these unsustainable practices is underscored, emphasizing the imperative for manufacturers, universities, knowledge disseminators, and educators to collaborate in fostering the development and production of viable, eco-friendly alternatives. This forward-looking approach aligns with global sustainability goals and encourages a collective commitment to mitigating the environmental impact of oral care products.
Subramanian et al. 2020 [58]	Biomedical waste management practice in dentistry. Bioinformation	Survey by questionnaires	A questionnaire was used to survey 355 dentists in India, including 201 students, 39 academicians, and 115 clinicians.	While a substantial number of students, practitioners, and academicians demonstrate a commendable understanding of the regulations governing biomedical waste management, there appears to be a significant gap in compliance with these laws. This incongruence between knowledge and practice highlights a crucial area for intervention and underscores the need for effective strategies to ensure adherence to biomedical waste management regulations.
Antoniadou et al. 2021 [32]	Circular Economy in Conjunction with Treatment Methodologies in the Biomedical and Dental Waste Sectors	Review	No info	Transitioning away from disposable products in the medical and dental sectors, coupled with improved biomedical and dental waste management, is envisioned to pave the way for the emergence of eco-medicine and eco-dentistry in the future. This shift signifies a commitment to sustainable practices that align healthcare services with environmental stewardship.
Borglin et al. 2021 [59]	The life cycle analysis of a dental examination: Quantifying the environmental burden of an	Review	A life cycle analysis was performed for a hypothetical dental practice's examination of one patient at the Faculty of Dentistry, Malmö University.	The modelled examination results highlight substantial contributions to environmental impact in the categories of water scarcity, freshwater eutrophication, and human toxicity, particularly cancer effects. Among the various components, stainless-steel instruments, clothing, soaps, and detergents emerge as the primary contributors

	examination in a hypothetical dental practice			to the environmental harm associated with the examination procedure.
Forzieri G. et al. 2021 [1]	Increasing risk over time of weather-related hazards to the European population: a data-driven prognostic study	Review	Using a prognostic modelling framework, we combined disaster records with high-resolution hazard and demographic projections up to the year 2100 (2011-40, 2041-70, and 2071-100) to estimate the risk of weather-related hazards to the European population in 30 year intervals compared to the reference period (1981–2010).	In the timeframe from 2071 to 2100, weather-related disasters have the potential to impact nearly two-thirds of the European population annually. This is a stark contrast to the reference period of 1981 to 2010, where only 5% of the population (25 million people per year) were exposed. The projected consequences include a significant increase in the number of deaths, with an estimated 152,000 fatalities by the year 2100—50 times more than the 3,000 deaths recorded during the reference period.
Martin et al. 2021 [3]	Drivers, opportunities and best practice for sustainability in dentistry: A scoping review	Scoping review	A scoping review was conducted for all English-language publications addressing this topic as of 31st April 2021.	Education stands as a fundamental element at all levels, serving as the cornerstone for future strategies. Strategies for the future include minimizing staff and patient commute due to reduced oral disease incidence, enhancing patient care logistics, and leveraging information technology. Moreover, there is a focus on heightened recycling opportunities, particularly for Single-Use Plastics (SUPs), and a commitment to waste reduction.
Martin et al. 2021 [60]	Awareness and barriers to sustainability in dentistry: A scoping review	Scoping review	A scoping review was conducted for all English-language publications addressing this topic as of 31st April 2021.	The sustainability of oral health provision has been shaped by eight closely interrelated yet diverse themes: Environmental impact (CO ₂ , air, and water); Reduce, reuse, recycle, and rethink; Policies and guidelines; Biomedical waste management; Plastics (SUPs); Procurement; Research & Education; Materials.
Ndokaj et al. 2021 [61]	Trends in Sustainable Dentistry	Review	No info	In the coming decade, dental advances are poised to deliver undeniable benefits to patients, operators, and the environment.

Wolf et al. 2021 [62]	Changing Dental Profession-Modern Forms and Challenges in Dental Practice	Editorial	No info	Advancements in research, including emerging fields like artificial intelligence and big data, along with the adoption of sustainable and green dentistry practices, teledentistry, and the overall digital transformation of healthcare, are influencing technical and professional aspects in dentistry. These changes have implications for dentists, oral health workers, and even patients. As a result, there may be a need to reorganize the activities of dental care providers to align with these evolving trends and technologies.
Byrne et al. 2022 [63]	Comparing the environmental impact of reusable and disposable dental examination kits: a life cycle assessment approach.	Review	To compare the impacts of a disposable plastic examination kit and a reusable stainless-steel examination kit, a life cycle analysis (LCA) was conducted.	The disposable kit exhibited poorer performance across all categories concerning ecological and human health harms. Significant impacts were observed in categories such as climate change, depletion of metals, minerals, fossil fuels, and water scarcity. The primary contributors to these impacts were sterilization procedures, material processing, and instrument production.
Martin et al. 2022 [64]	Quantification of single use plastics waste generated in clinical dental practice and hospital settings.	Irrelevant topic	In this observational study, trained and calibrated observers observed routine common procedures in four dental practices and a UK undergraduate dental teaching hospital.	In routine surgical setups, a notable portion of single-use plastic (SUP) waste stems from generic items. On average, each procedure generates twenty-one SUP plastic waste items, with an average weight of 354 grams. Notably, during the pandemic, the use of personal protective equipment increased from 14 to 19 items compared to the pre-COVID-19 period.
Martin et al. 2022 [6]	Consensus on Environmentally Sustainable Oral Healthcare: A Joint Stakeholder Statement	Consensus report	This research process was led by the FDI World Dental Federation Sustainability in Dentistry Task Team. From May to October 2021, a comprehensive three-wave Delphi inquiry was conducted with the key stakeholder focus group, followed by iterative drafts.	A consensus opinion on effectively mitigating the environmental impact of oral health care while maintaining patient welfare.

Mazur et al. 2022 [65]	Green dentistry: Organic toothpaste formulations. A literature review.	Review	To obtain a list of toothpastes available, they accessed Naturasi's online dental product database (https://www.naturasi.it/prodotti/cura-dellapersona/igiene-orale). From March 2021 to July 2021, literature data from PubMed, Scopus and Google Scholar databases were used to classify each ingredient as active or inactive.	Selecting organic toothpaste options is crucial for enhancing biocompatibility with oral tissues, helping consumers steer clear of potential adverse effects associated with polymers, carbomers, detergent agents, and triclosan.
Oviedo-Allison et al. 2022 [10]	The Sustainable Dentist – The New Normal	Review	No info	The article offers recommendations highlighting the advantages of adopting a sustainable approach in dentistry.
Abed et al. 2023 [66]	An environmental impact study of interdental cleaning aids	Irrelevant topic	Based on 16 discrete measures of environmental sustainability for a person using interdental cleaning aids every day for five years, a life cycle analysis was conducted.	Interdental cleaning with floss picks was found to have the largest environmental footprint across 13 impact categories. In contrast, bamboo interdental brushes or daily interdental cleaning exhibited the smallest environmental footprint, depending on the specific environmental impact category measured.
Khanna et al. 2023 [67]	An Overview of Dental Solid Waste Management and Associated Environmental Impacts: A Materials Perspective. Sustainability.	Review	No info	New-generation dental materials, such as nanomaterials, resin composites, and ceramics, serve as antimicrobial, restorative, and therapeutic agents in dentistry. Unlike traditional dental waste, which has typically been processed through incineration and landfilling, the utilization of these novel materials introduces additional environmental concerns.
Shinkai et al. 2023 [68]	Environmental sustainability related to dental materials and procedures in	Review	No info	Dental prosthetic procedures involve the extensive use of chemicals and materials, leading to significant environmental and socioeconomic risks. Improper disposal, waste generation, and the retention of materials by manufacturers, retailers, dental laboratories,

	prosthodontics: A critical review			and clinics contribute to these challenges. The associated costs, both environmental and economic, are embedded throughout the supply chain.
Spaveras et al. 2023 [69]	Awareness of Students and Dentists on Sustainability Issues, Safety of Use and Disposal of Dental Amalgam	Survey by questionnaires	The study included two different questionnaires for each group of participants (professionals and students). After posting the questionnaires on Google Forms (https://docs.google.com/forms/) (accessed on 1 October 2019), they were sent via email and social media to dentists attending scientific events organized by the dental association of Attica in the Metropolitan Area of Athens.	Dentists (39.8%) and students (36.4%) perceive amalgam as having a moderate environmental impact. Analysis based on responses from dentists with 6–25 years in practice and 4th-year undergraduates revealed a lesser understanding of the environmental footprint of dental amalgam among these groups. Moreover, a substantial percentage of professionals (70%) and students (60%) share the belief that dental amalgam negatively affects patients' health. When considering staff health, dentists reported a moderate level of perceived harmful effects, while students indicated dangerous impacts at a rate of 36.4%. Notably, the impact on the health of patients and staff demonstrated significant regional variations.
Thakar et al. 2023 [70]	Awareness and Constraints towards the Implementation of Green Dentistry amongst Dental Students and Private Practitioners of West India	Survey by questionnaires	22 questions were included in a cross-sectional, descriptive-analytical online questionnaire survey.	Approximately 51.8% of dental practitioners demonstrated a lack of awareness regarding the concept of green dentistry. An analysis using Chi-square revealed that dental practitioners aged between 20 and 30 years are more inclined to transform their clinics into environmentally friendly practices to minimize their carbon footprint. Furthermore, the analysis indicated that practitioners attending to more than 20 patients per week exhibit a higher awareness of the principles of green dentistry.