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**Systematic Review**

# Green dentistry: a systematic review for objective and subjective research

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## ABSTRACT

Dentistry's significant environmental impact and resource-intensive nature are concerning issues. Factors such as the environmental effects of biomaterials throughout lifecycle, radiation usage, and hazardous waste generation, including mercury and lead, need careful consideration. To counteract the environmental consequences of global warming, there is a growing global push to incorporate sustainability and green solutions. In response, dentists must transition from conventional practices to sustainable ones, embracing "green dentistry," which integrates sustainable development principles into dental care, underpinned by the 4 R's: Reduce, Reuse, Rethink, and Recycle. To assess the knowledge, attitude, and practices of dental professionals towards green dentistry, a questionnaire-based study was conducted. The search for relevant literature encompassed terms like "green dentistry," "eco-friendly dentistry," "recycling dental waste," and "sustainability in dentistry" through PubMed from 2001 to 2023, including English-language scientific and grey literature. Analysis of dental professionals' responses revealed notable disparities in eco-friendly dentistry knowledge between postgraduates (97.1%) and undergraduates (84.7%). Postgraduates exhibited better awareness of sterilization pouch disposal (68.1% vs. 49.2%) and mercury waste (85.5% vs. 61.9%). A substantial 82.9% recognized the potential for equipment recycling. While 16 articles were found from the PubMed database, spanning 2001 to 2023, originating from various sources, a broader exploration of quantitative and qualitative data on extraction was limited. There's a dearth of national research trends in this field. The study participants displayed satisfactory awareness of eco-dentistry, along with reasonable attitudes and adoption rates. However, continuous high-quality research is essential to comprehensively understand the impacts of environmentally friendly dental practices.

**Keyword:** Green dentistry, Eco-friendly dentistry, Recycling dental waste, Sustainability in dentistry, Recycle

## INTRODUCTION

Green dentistry, as defined by the eco-dentistry association, encompasses a high-tech approach that minimizes the environmental impact of dental practices.[1] while promoting overall wellness through a service model that integrates dentistry and environmental conservation.[2] This innovative approach arises from the pressing challenges posed by climate change, a critical concern of the 21st century affecting both social and environmental determinants of health. With escalating contamination of natural resources due to mounting waste generation across industries, including healthcare, the global shift towards ecological sustainability becomes imperative.[3]

A significant contributor to environmental pollution is the dental sector, where non-biodegradable waste, predominantly plastic-based, constitutes a substantial portion of generated waste.[4] Improper disposal of dental waste, such as disposable items like syringes, gloves, and masks, results in soil and groundwater pollution, threatening terrestrial and aquatic ecosystems. Inadequate waste management systems and lax regulations further exacerbate these environmental hazards.[5]

Statistics from the eco-dentistry association underscore the gravity of the issue, revealing that the dental industry annually produces staggering amounts of waste, including lead foils, toxic X-ray waste, mercury waste, sterilization

pouches, chair barriers, and toothbrushes.[6] As the global population becomes increasingly conscious of sustainability, the dental profession is called upon to align with green principles. This entails conserving water and energy, adopting non-toxic products, minimizing waste, and embracing eco-friendly practices.[6]

The present study endeavors to evaluate the awareness, knowledge, and practices of dental professionals in Indore towards sustainable and environmentally friendly dentistry. By incorporating the four R's-reduce, reuse, rethink, and recycle-into dental practices, the aim is to facilitate the transition toward a green economy.[7] Contrary to expectations, preliminary findings indicate that postgraduate professionals exhibit higher knowledge levels compared to undergraduates. However, the dearth of comprehensive research in the Indian context necessitates a more thorough investigation.

In response to this research gap, a scoping review was conducted to delineate the extent of research on sustainable green dentistry adoption by dental professionals. Utilizing a tree map visualization, the review identified key areas, enabling researchers to chart directions for future investigations and policy formulation.[8]

Through this study, the intention is twofold: firstly, to reorient dental professionals' attitudes and practices towards sustainable dentistry through evidence-based research; and secondly, to provide a comprehensive foundation of scientific literature to guide the formulation of protocols and guidelines, ensuring the integration of sustainable practices for the betterment of both oral health and the environment.

## MATERIALS

### *Study design and setting*

This study employed an evocative assessment of opinion polls to investigate the knowledge, attitudes, and practices of green dentistry and sustainable eco-friendly measures among dental professionals in Indore City, Madhya Pradesh. Study conducted from December 22 to March 23.

### *Participants*

All registered dentists under the state dental council were considered for participation. A total of 272 dental professionals responded to the study out of the 300 approaches, comprising both undergraduate and postgraduate qualifications.

### *Questionnaire development and validation*

A self-administered questionnaire consisting of 24 items was developed to evaluate participants' awareness, attitudes, and practices related to green dentistry. The questionnaire was validated for face validity, content validity, and reliability.

*Face validity:* Cohen's Kappa was used to assess inter-rater agreement among an expert panel of eight members, resulting in a value of 0.86, indicating substantial agreement.

*Content validity*: Expert panel validation and Content Validity Ratio (CVR) were employed. The CVR was calculated using Lawsche's approach, with all 24 items achieving a score indicating their essential inclusion.

*Construct validity:* As no existing questionnaire could be correlated with the developed questionnaire, construct validity was not assessed.

### *Data collection*

Questionnaires were sent to the participants through email after pre-telephonic contact. Efforts were made to ensure participant understanding and positive responses. A total of 258 dental professionals with both undergraduate and postgraduate qualifications were included in the final study population after exclusions due to typographical errors and incomplete information.

### *Data analysis*

Data were analyzed using the Statistical package for the social sciences (SPSS version 25; Chicago Inc., IL, USA). The normal distribution of data for awareness, attitudes, and practices was assessed using the Kolmogorov-Smirnov test. Chi-square tests were conducted to determine differences between undergraduates and postgraduates. A $p<0.05$ was considered statistically significant.

### *Ethical considerations*

Institutional Review Board approval and ethical clearance were obtained before conducting the study.

## RESULTS

The data analysis revealed varying degrees of knowledge, attitudes, and practices among undergraduate and postgraduate dental practitioners. Notably, while knowledge levels were relatively good, attitudes and practices towards green dentistry were found to be suboptimal. This mirrors the scarcity of evidence-based research on biomaterials, green practice management, and research allocation in the field of green dentistry, with descriptive KAP studies predominating over systematic reviews, meta-analyses, and randomized controlled trials.

On comparison among dental professionals, a significant difference was noted with awareness regarding eco-friendly dentistry, with 97.1% of postgraduates being familiar as against 84.7% of undergraduates at $p=0.007$.

The knowledge levels of postgraduate professionals were significantly better regarding mercury wastage (85.5% vs 61.9) and dumping of sterilization pouches (68.1% vs 49.2%). Overall, 82.9% of respondents were aware of recycling worn-out instruments. Lesser than half of the study population knew about EDA programs, 69% felt that innovations in green dentistry include digital patient charting, steam sterilizers, and CAD CAM (Table 1).

On evaluating attitudes regarding eco-friendly practices leading to more patients, 34.8% of post graduate professionals strongly agreed as compared to 26.5% of undergraduate dentists which was significant at p=0.029.

Similar results were noted for green practice being economical to dentists (Table 3). No significant difference was noted in practices regarding eco-friendly dentistry except for method of maintaining patient records. While post-graduate professionals preferred digital maintenance in higher percentage as matched to their undergraduate complements, significant at p=0.003 (Table 4).

Overall, result of descriptive study referred to good knowledge but attitude and practice not adopted in their routine practice. So, exploratory literature search attempted to study global research patterns for pollution control, green environment among dental professionals.

**Table 1: Knowledge-related questions' responses of study participants, (n=258).**

| Questions | Responses, n (%) | | | | Chi square | P value |
|---|---|---|---|---|---|---|
| | Undergraduates | | Postgraduates | | | |
| | Yes | No | Yes | No | | |
| **Are you familiar with the notion behind eco-friendly dentistry?** | 84.7 (160) | 15.3 (29) | 97.1 (67) | 2.9 (2) | 7.406 | 0.007 |
| **Did you know that dentists contribute to 70% of total mercury load entering waste water treatment facilities?** | 16.9 (117) | 38.1 (72) | 85.5 (59) | 14.5 (10) | 12.987 | 0.000 |
| **Did you know that nearly 1.7 billion instrument sterilization pouches are dumped into landfills yearly?** | 49.2 (93) | 50.8 (96) | 68.1 (47) | 31.9 (22) | 7.283 | 0.007 |
| **Are you aware that worn out dental instruments can be recycled?** | 81 (153) | 19 (36) | 88.4 (61) | 11.6 (8) | 1.985 | 0.159 (NS) |
| **Are you aware of biodegradable electronic supplies?** | 56.1 (106) | 43.9 (83) | 71 (49) | 29 (20) | 4.698 | 0.030 |
| **Are you aware of the programs endorsed by eco-dentistry association?** | 40.2 (76) | 59.8 (113) | 60.9 (42) | 39.1 (27) | 8.691 | 0.003 |
| **Which of the following is an eco-friendly amalgam management practice?** | | | | | | |
| Keeping unused amalgam in poorly-sealed containers | 2.1 (4) | | 5.8 (4) | 4.689 | 0.196 (NS) | |
| Use of amalgam separator | 51.9 (98) | | 25.2 (33) | | | |
| All of the above | 20.1 (38) | | 27.5 (19) | | | |
| None of the above | 25.9 (49) | | 18.8 (13) | | | |
| **Which of the following is a sustainable dental hygiene product?** | | | | | | |
| Bamboo toothbrush | 28.0 (53) | | 40.6 (28) | | | |
| Nylon dental floss | 6.3 (12) | | 8.7 (6) | | | |
| Copper tongue cleaner | 7.4 (14) | | 0 (0) | 10.595 | 0.032 | |
| All of the above | 54.5 (103) | | 43.5 (30) | | | |
| None of the above | 3.7 (7) | | 7.2 (5) | | | |
| **Which of the following is an eco-friendly type of flooring?** | | | | | | |
| Bamboo | 57.7 (109) | | 68.7 (47) | | | |
| Vinyl | 7.9 (9.0) | | 2.9 (2) | | | |
| Marble | 9.0 (17) | | 2.9 (2) | 5.805 | | 0.214 (NS) |
| All of the above | 14.8 (28) | | 17.4 (12) | | | |
| None of the above | 10.6 (20) | | 8.7 (6) | | | |
| **Which of the following is a green infection control practice?** | | | | | | |
| Use of non-biodegradable disinfectants | 3.2 (6) | | 13.0 (9) | 13.184 | | 0.10 |
| Use of HDPE plastic disinfectant pump spray bottles | 44.4 (84) | | 50.7 (35) | | | |
| Use of washable cloth lab coats rather than disposable ones | 9.0 (17) | | 2.9 (2) | | | |
| All of the above | 37.0 (70) | | 30.4 (21) | | | |
| None of the above | 6.3 (12) | | 2.9 (2) | | | |

Continued.

| Questions | Responses, n (%) | | Chi square | P value |
|---|---|---|---|---|
| | Undergraduates | Postgraduates | | |
| | Yes | No | | |
| **Which of the following is an innovation employed in green dentistry?** | | | | |
| Digital patient charting, scheduling, billing and records | 6.9 (13) | 11.6 (8) | 13.971 | 0.016 |
| Digital imaging system | 1.6 (3) | 8.7 (6) | | |
| CAD/CAM system | 6.9 (13) | 2.9 (2) | | |
| Steam sterilizers | 12.7 (24) | 8.7 (6) | | |
| All of the above | 70.9 (139) | 63.8 (44) | | |
| None of the above | 1.1 (2) | 4.3 (3) | | |
| **Which of the following methods would be effective in reducing the dental industry's carbon footprint?** | | | | |
| Reducing appointment frequency based on patient risk | 4.8 (9) | 10.9 (7) | 16.604 | 0.005 |
| Combining visits for family members | 4.8 (9) | 0 (0) | | |
| Encouraging cycle to work schemes/ car-pooling for staff | 11.1 (21) | 5.8 (4) | | |
| Implementing telemedicine and teleconferencing for patients | 14.3 (27) | 2.9 (2) | | |
| All of the above | 59.8 (113) | 69.6 (48) | | |

**Table 2: Attitude related questions' responses of study participants.**

| Questions | Responses, n (%) | | Chi square | P value |
|---|---|---|---|---|
| | Undergraduates | Postgraduates | | |
| | Yes | No | | |
| **With overwhelming evidence of global climate changes, do you consider it ethical duty to practice sustainable dentistry?** | | | | |
| Strongly agree | 43.9 (83) | 46.4 (32) | | |
| Agree | 38.6 (73) | 43.5 (30) | | |
| Neutral | 15.3 (29) | 7.2 (5) | 6.418 | 0.170 |
| Disagree | 1.6 (3) | 0 (0) | | |
| Strongly disagree | 0.5 (1) | 2.9 (2) | | |
| **In your opinion, would eco-friendly practices lead to more patients visiting your clinic?** | | | | |
| Strongly agree | 26.5 (50) | 34.8 (24) | | |
| Agree | 39.7 (75) | 26.1 (80) | | |
| Neutral | 30.7 (58) | 27.5 (19) | 10.762 | 0.029 |
| Disagree | 2.6 (5) | 8.7 (6) | | |
| Strongly disagree | 0.5 (1) | 2.9 (2) | | |
| **In your opinion, would eco-friendly practices reduce your work efficiency?** | | | | |
| Strongly agree | 8.5 (16) | 18.8 (13) | | |
| Agree | 19 (36) | 21.7 (15) | | |
| Neutral | 37 (70) | 33.3 (23) | 6.708 | 0.152 (NS) |
| Disagree | 30.2 (57) | 23.2 (16) | | |
| Strongly disagree | 5.3 (10) | 2.9 (2) | | |
| **Do you think there is a need for formally educating clinicians regarding green practices?** | | | | |
| Strongly agree | 44.4 (84) | 49.3 (34) | | |
| Agree | 36.5 (69) | 42.2 (29) | | |
| Neutral | 13.2 (25) | 8.7 (6) | 5.543 | 0.236 |
| Disagree | 2.1 (4) | 0 (0) | | |
| Strongly disagree | 3.7 (7) | 0 (0) | | |
| **Do you think that fluctuating to green practice would be more cost-effective to dentists, require negligible resources and no additional cost of basic organization?** | | | | |
| Strongly agree | 24.9 (47) | 37.7 (26) | | |
| Agree | 36.5 (69) | 34.8 (24) | | |
| Neutral | 29.1 (55) | 18.8 (13) | 18.812 | 0.001 |
| Disagree | 9.5 (18) | 2.9 (2) | | |
| Strongly disagree | 0 (0) | 5.8 (4) | | |

**Table 3: Practice related questions' responses of study participants, (n=258).**

| Questions | Responses, n (%) | | Chi square | P value |
|---|---|---|---|---|
| | Undergraduates | Postgraduates | | |
| | Yes | No | | |
| **While washing hands, do you turn off the water while lathering?** | | | | |
| Always | 51.3 (97) | 69.6 (48) | 7.416 | 0.060 (NS) |
| Often | 25.9 (49) | 15.9 (11) | | |
| Sometimes | 21.2 (40) | 14.5 (10) | | |
| Rarely | 1.6 (3) | 0 (0) | | |
| **What are the energy management practices followed in your clinic?** | | | | |
| Use of LED light bulbs | 34.4 (65) | 40.6 (28) | 2.229 | 0.26 (NS) |
| Use of renewable sources of energy | 10.6 (20) | 10.1 (7) | | |
| All of the above | 42.9 (81) | 33.3 (23) | | |
| None of the above | 12.2 (23) | 15.9 (11) | | |
| **What are the paper waste management practices followed in your clinic?** | | | | |
| Recycle dental office waste | 10.6 (20) | 17.4 (12) | 4.110 | 0.391 (NS) |
| Use of recycled paper products | 6.9 (30) | 10.1 (7) | | |
| Donate old magazines and dental books to libraries or community centres | 15.9 (30) | 15.9 (11) | | |
| All of the above | 52.5 (99) | 40.6 (28) | | |
| None of the above | 14.3 (27) | 15.9 (11) | | |
| **Which of the resulting eco-friendly objects do you use instead of disposable ones?** | | | | |
| Cloth drape, head cap and arm rest covers | 23.8 (48) | 40.6 (28) | 8.851 | 0.072 (NS) |
| Reusable glass/ metal cups and metal suction tips | 9.5 (18) | 14.3 (3) | | |
| Reusable metal air/ water syringe | 6.9 (13) | 2.9 (2) | | |
| All of the above | 51.9 (98) | 44.9 (31) | | |
| None of the above | 7.9 (15) | 7.2 (5) | | |
| **Do you use any eco-friendly dental hygiene products and would you advise your patients to use the same?** | | | | |
| Yes | 83.1 (157) | 73.9 (51) | 2.712 | 1.000 (NS) |
| No | 16.9 (32) | 26.1 (18) | | |
| **What is your preferred method of maintaining patient records?** | | | | |
| Yes | 28 (53) | 10.1 (7) | 9.072 | 0.003 |
| No | 72 (136) | 89.9 (62) | | |
| **What type of personal protection equipment do you use?** | | | | |
| Yes | 65.1 (123) | 43.5 (39) | 1.5840 | 0.208 (NS) |
| No | 34.9 (66) | 56.5 (30) | | |

**Table 4: Descriptive bibliometric analysis.**

| Variables | Analysis |
|---|---|
| **Main information about data** | |
| Timespan | 2001-2023 |
| Sources (journal, books, etc) | 10 |
| Documents | 17 |
| Annual growth rate (%) | 0 |
| Document average rate (%) | 7.18 |
| Average citation per doc | 0 |
| References | 1 |
| **Documents contents** | |
| Keywors plus (id) | 51 |
| Authors keyword(de) | 51 |
| **Authors** | |
| Authors | 44 |
| Authors of single- authored docs | 7 |
| Authors collaboration | - |
| Single-authored docs | 7 |
| Co-authors per doc | 2.71 |
| Inetrnation co-authorship (%) | 17.65 |

Continued.

| Variables | Analysis |
|---|---|
| **Document types** | |
| Comment, letter | 1 |
| Editorial | 3 |
| Journal articles | 7 |
| Journal articles;research support non-u.s.govt | 1 |
| Journal articles:review | 1 |
| Letter | 3 |
| News | 1 |

All the available grey literature including books, documents, journals published articles were screened for green dentistry and eco-friendly dentistry, and to astonishing facts, annual growth rate is >1 which is very thought-provoking that research orientation is trivial on such an imperative aspect of health science which is directly connecting with as environment sanitation and health- full living of human mankind. Very few authors have globally intricate research in this direction and so the massive voids need to be addressed initiating more epidemiological data by scientific evidence-based literature as a key component for stakeholders in designing and implementing policies, protocols and guidelines towards prevention of obnoxious waste generated by dental practice and to recommend environmentally friendly lifestyle.

For exhaustive appraisal for quantitative as well as qualitative data on extraction very few evidence obtained. These 16 articles published between 2001-2023 from the PubMed database. Those articles have been published in 10 sources consisting mainly in scientific journals. Total number of author were 44 world- wide. National level inclination on research orientation into this field is barely there.

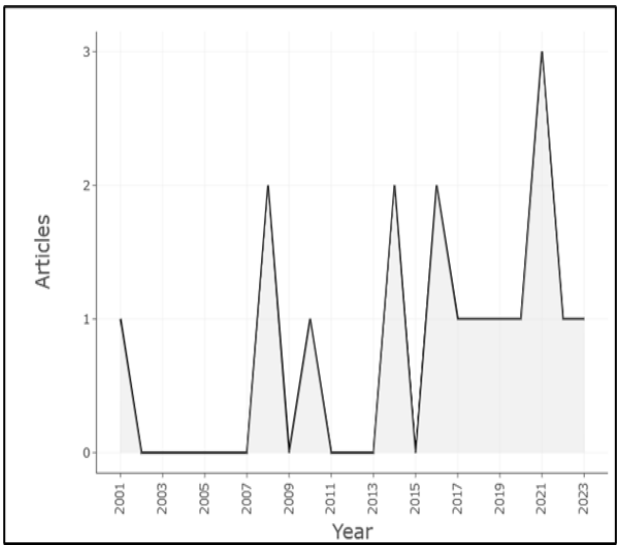


**Figure 1: Annual scientific production.**

To gauge the extent representation of annual scientific production of articles of a nearly two decades demonstrating peaks and valleys of scientific output over the years from 2001 to 2023. The conviction towards natural disasters and prevention of humanity upstretched due to unprecedented situation of COVID Pandemic The highest number of articles were published in 2021, followed by 2 articles each in 2008, 2014 and 2016. Following publication of 1 article in 2001, there was a period of nil research output from 2002 to 2007. Increased number of publications after 2020 shows growing interest of research community towards green dentistry succeeding COVID-19 pandemic.

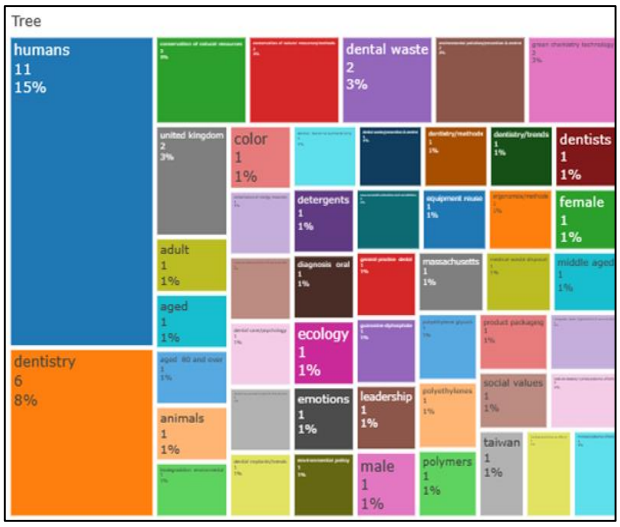


**Figure 2: Tree map visualizing various strictures of green dentistry available in already existing literature.**

On scoping exploration of keyword plus for all the strictures connecting human mankind to green dentistry or eco-friendly dentistry over and done with a tree map. Each box in the tree map represents a keyword and the dimension of the box is directly proportional to the frequency of the keyword used. It remarks both the frequency and percentage of the word used by the unique data visualization tool tree map it can be determined that humans (15%) descriptive studies on the valuation of knowledge, assertiveness, and performance on green dentistry methods integrate bulk to pave concrete background for futuristic organization, followed by dentistry (8%) on the whole to reduce, reuse, recycle, rethink procedures related to dentistry and dental materials/chemistry (1%). However, keywords like waste disposal, waste management, and green alternatives are missing in the word cloud. There is a need for further research on the management of medical disposable waste

in order to fill the gap in this research field. Data in a hierarchical manner, effective like green dentistry or eco-friendly dentistry on categorically exploring almost zilch on the procedural escalation of bio-friendly techniques or materials are unfilled. This category would cover the types of materials used in dental procedures and products, such as composite resins, amalgams, and toothbrushes future concentration on sustainable or biodegradable materials is required. This category would focus on the energy consumed by dental offices, including the use of renewable energy sources, energy-efficient appliances and lighting, and reduced energy consumption through green building design. Waste management, such as amalgam waste, contaminated materials, and packaging waste. Eco-friendly practices might include using recycling and composting programs, reducing waste through source reduction, and implementing proper hazardous waste management. conservation of water resources, including strategies such as low-flow faucets and toilets, rainwater harvesting, and the use of water-efficient dental equipment.

## DISCUSSION

The present study sought to assess awareness, attitude and practices regarding Green dentistry among dental practitioners in Indore city. It demonstrates the following key findings: 1) Participants have a conceptual understanding of green dentistry. 2) Participants believe that the potential increase in new patient visits makes green dentistry financially advantageous. 3) Participants relate ethics to environmental awareness as well as care for the patient's welfare. 4) The majority of participants practice energy and water conservation.

In this study, 88.0% participants exhibited awareness about the creed behind eco-dentistry, which is significantly higher than a study by Chandrashekhar et al where 64.4% respondents were aware.[9] Additionally, in a study by Prathima et al only 40.6% participants were aware of the same. The usage of social media as a platform for business advertising and promotion has increased during the past few years. Dentists are increasingly exposed to more modern and successful marketing techniques. Clientele who are "woke" have become interested in greener dental practices, which gives conventional dental professionals the motivation to keep up with this growing movement in the dentistry market.

The 45.7% participants were familiar with eco-dentistry association (EDA) in the current study whereas an even lower percentage of respondents i.e. 24% were aware of EDA in study by Nagarale et al.[10] Our study revealed that 69.0% respondents maintained digital records which was found to be lower than a study by Chopra and Raju where 62% respondents maintained digital records.[11] The 75% participants in the current study believed that making a shift to green dentistry would attract more patients to their clinic which was found to be slightly lower than a study by Parakh et al where 87% respondents shared the same belief.[12]

The 64.7% participants in the current study believed that making a shift to green dentistry would attract more patients to their clinic which was found to be slightly higher than a study by Parakh et al where 87% respondents shared the same belief.[12]

We think that the pandemic scenario may have contributed significantly to the overwhelmingly positive replies that we received. The deep and delicate connections between people and their environment have been made clear by the COVID-19 epidemic. It's possible that the mayhem brought on by an airborne virus has made people more aware of the worsening environmental problem. This may have inspired people to take action in any way they saw fit to protect the environment.

People are dying as a result of the same unsustainable decisions that are destroying our planet. At the United Nations climate change conference on October 11, 2021, the world health organization (WHO) urged all nations to pledge to take strong action to keep global warming to 1.5 degrees Celsius. One of their suggestions is to fully redirect current funding towards the development of sustainable energy. 2) High-income nations should reduce greenhouse gas emissions more drastically 3. Governments should create sustainable, low-carbon health systems that are robust to climate change.[13]

A scoping review on green dental practice commenced to comprehend gaps in available literature. Considering to map the evidence based publications on sustainable dentistry, the environmental impact of dental practices, the effectiveness and feasibility of eco-friendly products and materials, and the implementation of sustainable dentistry. researchers can identify areas where more research is needed, as well as highlight best practices and successful implementation strategies. This can help to inform the development of evidence-based policies. Additionally, pavement on identification of barriers and challenges for futuristic goals as well as opportunities for collaboration and innovation in promotion. This can advantage to uphold the adoption of sustainable practices across the dental profession. As the world becomes more aware of the impact of human activities on the environment, it is important for professionals in all industries to adapt their practices to be more sustainable.[14] In the dental industry, this means implementing green dental practices that are eco-friendly and reduce the carbon footprint of dental clinics. Dental professionals can also educate their patients on the importance of green dental practices in reducing their environmental impact by practicing good oral hygiene and using eco-friendly dental products. By adopting these professional attitudinal changes, dental clinics can reduce their environmental impact and promote a more sustainable future. It is true that there is currently a dearth of published literature for policy formulation and protocols in green dental practices. Policies and protocols

are important tools for guiding dental professionals and ensuring that sustainable practices are implemented effectively and consistently. Despite the lack of published literature, there are still many steps that dental professionals can take to promote sustainable practices in their clinics. This includes reducing waste and energy consumption, using eco-friendly products and materials, and implementing water conservation measures. Additionally, dental professionals can work with their colleagues and professional organizations to develop and share best practices for sustainable dentistry.[15] It is important for dental professionals, policymakers, and researchers to continue to work together to develop evidence-based policies and protocols for green dental practices. This will require ongoing research, collaboration, and investment in the field of sustainable dentistry. By working together, we can promote a more sustainable future for oral health care while also providing high-quality care for our patients.

### *Limitations*

This study's use of self-administered questionnaires introduces potential response bias, as participants might provide socially desirable or inaccurate information about their eco-friendly behaviors. The study's narrow focus on Indore city limits the generalizability of findings to areas with differing socioeconomic and cultural contexts, neglecting factors like urbanization, education, and resource availability that influence green dentistry practices. The scoping review's limitations include possibly missing relevant articles on eco-friendly dental practices due to subjective article selection and keyword choices. The study concludes by emphasizing the scarcity of comprehensive research and the need for more rigorous studies to understand the relationship between green dentistry practices, oral health, and the environment. While offering valuable insights, caution is needed when interpreting results due to the reliance on self-reports and the limited geographic scope. Future research should adopt diverse qualitative and quantitative approaches and broader geographic representation to enhance understanding of eco-conscious dental practices and their implications.

## CONCLUSION

Among descriptive study participants' awareness of eco-dentistry was adequate, while their attitudes towards it and their application of it were reasonable. Eco-friendly dentistry is undoubtedly a trend worth investigating in the post-pandemic period if this study is any indication that "going green" has grown popular. While green dental practices are gaining popularity and becoming more common, there are still some gaps or lacunae that need to be addressed in streamlining scientifically to fully realize the benefits of these practices: Barriers in attainment need to be precisely consider. Promotion of evidence-based research in this area can be challenging to conduct, as it often involves complex environmental and social factors that are difficult to measure and quantify. It is important for researchers to continue to conduct high-quality studies on the impact of green dental practices. This will help to provide a more comprehensive understanding of the benefits and challenges of sustainable dentistry, and to inform the development of evidence-based practices that can be widely adopted in clinical settings.

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