

INNOVATION AND SUSTAINABILITY: HOW DID A JUNIOR DENTISTRY COMPANY ACHIEVE THESE GOALS?



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ABSTRACT

Climate change, driven by human activities, has caused serious impacts on natural and human systems, demanding sustainable practices, including in dentistry. UEM's Junior Dentistry Enterprise created an Ecopoint for the disposal of used toothbrushes, aiming to promote environmental awareness and the reuse of materials. This article discusses the implementation of the Ecopoint, its environmental and social effects, and how this initiative can inspire other sustainable actions in the area.

Keywords: Climate change, Recycling.

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INTRODUCTION

Climate change, globally recognized as one of the greatest challenges of contemporary times, has its origin largely attributed to human activities. Robust scientific evidence demonstrates that global average temperatures have already significantly exceeded pre-industrial levels, a phenomenon that cannot be explained without considering anthropogenic greenhouse gas emissions. The consequences of this process are far-reaching and directly impact various natural and human systems, manifesting themselves through warming of the oceans and atmosphere, changes in precipitation patterns, rising sea levels, and acidification of marine ecosystems¹.

In response to this scenario, the adoption of sustainable practices has become imperative in all sectors, including the healthcare field. Dentistry, as an integral part of the healthcare system, uses a wide range of materials and equipment, many of which generate biomedical and chemical waste that pose considerable environmental challenges. As an area committed to environmental preservation, dentistry has sought to reevaluate and reformulate its practices in order to mitigate negative impacts on the environment².

In this context, the Junior Enterprise of Dentistry of the State University of Maringá (Insight Odonto UEM) stands out for a pioneering initiative: the creation of the first national Ecopoint for the disposal of used toothbrushes. This innovative action aimed to foster environmental and social awareness among dentists, academics and the general population, promoting the proper disposal of dental waste, with an emphasis on toothbrushes, a widely used and discarded item. Toothbrushes, made with a specific type of recyclable plastic, can be reused to make urban furniture, such as tables, chairs, and benches for public areas, generating direct benefits for the community and reducing the environmental impact associated with improper disposal.

The objective of this article is to present and discuss the implementation of the Ecopoint for toothbrush disposal, evaluating its environmental and social impacts. The study seeks to demonstrate how this initiative can serve as a model for other sustainable actions in the dental sector, promoting ecological responsibility and encouraging the recycling of materials commonly used in dental practice.

DEVELOPMENT

Within this context, sustainability in dentistry is becoming increasingly relevant, especially considering the environmental impact of clinical and educational practices.

Dental clinics and educational institutions can adopt various sustainable practices, such as reducing CO₂, energy, and water consumption, using biocompatible and recyclable materials, and implementing efficient waste management processes. These practices not only minimize the environmental impact of dentistry, but also foster a culture of ecological responsibility among future professionals, preparing them to incorporate these values into their daily practice¹.

Despite these advances, dental waste management remains a critical area within sustainable dentistry and improper management of this waste, including materials such as amalgam, composite resins, latex gloves and syringes, can have a significant environmental impact. Although the topic is gaining relevance, there is still a widespread lack of awareness, both among professionals in the field and in the general population, which results in the incorrect disposal of materials that have significant potential for recycling or reuse. One of the main challenges involves plastics used in dental products, such as toothbrushes, which are often disposed of improperly, contributing to environmental pollution, as these materials can take decades to decompose in landfills³.

The recycling potential of plastics used in toothbrushes is largely underutilized. These materials, due to their durability and quality, could be reused in new forms after recycling processes, which would transform the waste into resources for the production of street furniture or other items of public utility⁴.

Junior companies proved to be fundamental in promoting sustainable practices in universities, including Dentistry Courses. Managed by students under the supervision of professors, these organizations provided hands-on experience in management and entrepreneurship, while also acting as laboratories for the implementation of sustainable initiatives. Projects focused on the dissemination of ecological practices among students were observed, encouraging their application in the professional market. A practical example of this action was the creation of ecopoints, which facilitated the correct disposal of toothbrushes and other recyclable waste, promoting significant changes in the dental sector⁵.

Additionally, the inclusion of entrepreneurship and innovation in the curricula of Dentistry Courses is essential, especially in a field where the demands for new technologies and practices are continuous. Integrating disciplines focused on sustainability and innovation into academic programs not only stimulates students' creativity, but also prepares them to face market challenges with differentiated solutions. The adoption of new

materials, technologies, and processes that reduce environmental impact is a growing need in the dental field. By fostering an innovative mindset among future dentists, educational institutions contribute to the development of more ecological and sustainable practices, aligning the profession with the principles of social and environmental responsibility⁶.

Sustainability in Dentistry, therefore, should not be seen as a momentary trend, but as a continuous and strategic commitment to environmental preservation and social well-being. The integration of sustainable practices into the academic training and operation of clinics is vital to ensure that the profession develops in an ethical and responsible manner, in tune with the needs of the planet. Higher education plays a crucial role in this process, as it is in the university environment that future professionals are sensitized and trained to promote effective changes in their areas of activity⁷.

RESULTS

The implementation of the first ecopoint exclusively for the disposal of toothbrushes in Brazil, located in Maringá, Paraná, presented significant results, highlighting the effectiveness of the project in the management of plastic waste. The ecopoint was strategically installed in 50 locations, including Basic Health Units (UBS), schools and public spaces, aiming to ensure wide access and facilitate correct disposal, both for students and health professionals.

The active participation of the population was amplified by educational campaigns carried out in schools and UBSs, which played a crucial role in raising awareness about the environmental relevance of this correct disposal. Feedback from the community has been largely positive, with many residents highlighting the convenience and practicality offered by the recycling bins.

Reports aired on television and radio stations helped increase the visibility of the initiative, promoting public awareness and generating interest in other regions. The media impact was essential for the replication of the model in other places. Inspired by the success of Maringá, the Northeast region of Brazil implemented a new recycling bin for toothbrushes, replicating the original design and structure. This new recycling bin was also accompanied by educational campaigns, highlighting the potential of the project to be adapted and adopted in different regional contexts.

The continuous evaluation of the effectiveness of the recycling bin in Maringá has shown that the project fulfills its objective of improving the disposal of toothbrushes and

reducing plastic pollution. The infrastructure of the ecopoint is working properly, with regular maintenance and positive reception by the community.

The partnership between the Municipality of Maringá, the State University of Maringá, the Department of Dentistry and Insight Odonto UEM have been fundamental to ensure the sustainability and operational success of the ecopoint. The results achieved so far highlight the importance of innovative solutions in solid waste management and demonstrate how local approaches can offer effective responses to environmental challenges.

DISCUSSION

The results achieved with the creation of the ecopoint for toothbrushes in Maringá demonstrate the positive impact of simple and locally adapted solutions in the management of dental plastic waste. The choice of ecopoint locations was essential to maximise community participation and ensure that the project had a significant impact. In addition, the high adherence to the system is also due to the effectiveness of awareness campaigns, showing that environmental education is fundamental for changing the population's behavior.

Another relevant aspect of this project was its replicability. The successful replication of the model in the Northeast of Brazil underscores the initiative's potential for scalability. The fact that the project has been successfully implemented in another region of the country, with its own socioeconomic and cultural particularities, demonstrates that local approaches, when adapted to regional needs and contexts, can generate equally positive results. This paves the way for the model to be adopted in other locations, both nationally and internationally, offering an efficient solution for the disposal of toothbrushes and other dental waste.

The collaboration between the Municipality of Maringá and local institutions was one of the pillars that ensured the sustainability and success of the project. This type of partnership is essential to ensure that waste management initiatives are supported on an ongoing basis, both in terms of infrastructure maintenance and community engagement. The experience of Maringá suggests that the combination of adequate infrastructure, community education and institutional support can generate significant advances in solid waste management and environmental preservation.

In short, the toothbrush recycling bin project has not only promoted environmental awareness among the local population, but has also demonstrated that simple solutions, when well planned and executed, can have a profound impact on reducing plastic pollution and creating a culture of sustainability. The success of the initiative in Maringá and its expansion to other regions reinforce the importance of public policies and institutional partnerships in facing contemporary environmental challenges.

While the project has shown promising results, there are challenges to consider for the continuity and expansion of the initiative, such as the need to ensure ongoing resources for infrastructure maintenance and long-term community engagement.

The scarcity of scientific papers addressing the intersection between entrepreneurship and sustainability in dentistry represented a significant challenge in the production of this article. Despite the growing relevance of these themes for modern dental practice, the available literature was limited, making it difficult to establish the theoretical foundation and contextualize the proposed arguments. This gap revealed the urgent need for more research that explored how entrepreneurial practices could be sustainably integrated into dentistry, contributing not only to innovation in the sector but also to a positive environmental impact. The absence of robust data and practical examples made the discussion even more complex, highlighting the importance of investigating this interface in more depth.

CONCLUSIONS

The implementation of the ecopoint for toothbrushes by Insight Odonto UEM was a milestone in the sustainable management of dental waste in Brazil. The project not only contributes to the reduction of plastic pollution, but also promotes environmental awareness among the community and future professionals. The integration of sustainable practices into academic training and dental practice is essential to ensure that the profession evolves responsibly and sustainably. The success of the project in Maringá serves as a valuable model for other cities and regions, proving that the integration of adequate infrastructure, community education, and institutional support can generate significant advances in waste management and environmental preservation. The scarcity of studies on entrepreneurship and sustainability in dentistry made it difficult to prepare this article, highlighting the need for more research to integrate these practices into the sector and promote innovation with a positive environmental impact.

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