Article Analysis

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Article Title: Combining Evidence-based Healthcare with Environmental Sustainability: Using the Toothbrush as a Model

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Article Analysis

Summary of the article

Alexandra Lyne, Paul Ashley, Sophie Saget, et al. conducted an evidence-based quantitative study. The study took place at London's Global University, and it was published in a journal on September 11, 2020 (https://discovery.ucl.ac.uk/id/eprint/10111617/3/Ashley_LCA%20toothbrush%20BDJ%20revisedL.pdf.) The main purpose of conducting this research was to investigate the different levels of sustainability of four types of toothbrushes and determine the life cycle aspects that have an environmental impact. The researchers used the Life cycle assessment (LCA) to conduct the study. They used four toothbrushes: a plastic manual brush with interchangeable heads, a traditional plastic brush, a bamboo manual brush, and an electric toothbrush. They used a toothbrush lifespan of five years to compare the sustainability of the four toothbrushes. The researchers found that the electric toothbrush was the least effective and least environmentally sustainable among all the four brushes. The researchers also conducted a statistical analysis of the findings. The researchers also found that the plastic manual brush with an interchangeable head and the manual bamboo toothbrush was more effective than the electric and plastic manual toothbrushes. Thus, people should replace their toothbrushes with changeable head plastic or bamboo brushes with traditional toothbrushes. The findings from this study can be used to guide the oral health of persons.

Article information

Title: Combining Evidence-based healthcare with environmental sustainability: using the toothbrush as a model

Authors: Alexandra Lyne, Paul Ashley, Sophie Saget, et al.

Link:

British Dental Journal| Volume 229 No.5. All London's Global University (UCL.ac. the UK)
https://discovery.ucl.ac.uk/id/eprint/10111617/3/Ashley_LCA%20toothbrush%20BDJ%20revisedL.pdf

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Study analysis

Type of study

Alexandra Lyne, Paul Ashley, Sophie Saget, et al. conducted an evidence-based quantitative study. The researchers used a Life cycle assessment (LCA) methodology to conduct their research.

Study purpose

The main purpose of conducting this study was to investigate the different levels of sustainability of four types of toothbrushes, namely, a plastic manual brush with interchangeable heads, a traditional plastic brush, a bamboo manual brush, and an electric toothbrush. Besides, they wanted to identify the life cycle aspects that have the most significant environmental effect.

Experimental design

The researchers used four types of toothbrushes to conduct their life cycle assessment experiment. The researcher used physical allocation by mass to conduct the LCA from the beginning of the investigation to the end. A toothbrush that has existed for more than five years was used as the viable unit. The researchers chose to work with a time frame of five years because that is the average lifespan that a battery in an electric toothbrush can take. The whole product structure, including the geographical location, was analyzed given that all the other brushes were manufactured within Europe except for the bamboo brush manufactured in China.

Sadly, the researchers could not access the environmental data for raw bamboo, which was used to form the holder of the bamboo manual brush. Thus, the researchers used approximations and assumptions from the green delta consultancy firm. Further, the researchers dismantled the toothbrushes to determine and weigh the constituting materials. Again, they communicated with the manufacturers to obtain additional information about the manufacturing process, materials used, packaging, and mode of transport used. They also calculated the sum of products used for more than five years; they used the energy consumption (kWh) for items whose information was lacking. The modeled data from the life cycle inventory (LCI) was in OpenLCA v1.8 to investigate the LCIA. The researchers selected the most suitable LCIA method for every category depending on the PEF category rules guidance. The researcher also conducted a statistical analysis of their findings.

Results

The researchers found out that the plastic manual brush with an interchangeable head and the manual bamboo toothbrush was more effective than the electric and plastic manual toothbrushes. The electric toothbrush's sustainability was below average because it was prone to enormous environmental effects such as water scarcity. Furthermore, climate change impacted the electric brush eleven times more than the bamboo toothbrush. Besides, the electrical had more impact on the substantial decrease in biodiversity, thirty-six times more than the bamboo brush. Furthermore, the electric toothbrush was the least effective among the four types of toothbrushes, and it has more adverse impacts on the environment.

Conclusions

It is advisable and more environmentally practical for people to change their toothbrushes from traditional toothbrushes to changeable head plastic or bamboo brushes. The electric toothbrush is the least environmentally sustainable brush among the four types of toothbrushes. However, the researchers identified that the LCA research methods were not so effective.

Your impression

This article follows all the rules of a credible source of research. Besides, it uses simple English that any person can easily understand. Furthermore, the researchers subdivided the information into subtopics, thus making it easy for readers to navigate. The findings from this research help influence the consumer choice of type of brush. Furthermore, the dentist can use them for oral health recommendations and toothbrush manufacturers to decide on the most consumer-friendly type of brush.

References

Lyne, A., Ashley, P., Saget, S., Porto Costa, M., Underwood, B., & Duane, B. (2020). Combining evidence-based healthcare with environmental sustainability: using the toothbrush as a model. British Dental Journal, 229(5), 303-309.