



ISSN: 0975-833X

Available online at <http://www.ijournalcra.com>

INTERNATIONAL JOURNAL
OF CURRENT RESEARCH

International Journal of Current Research
Vol. 14, Issue, 04, pp.21227-21230, April, 2022
DOI: <https://doi.org/10.24941/ijcr.43372.04.2022>

RESEARCH ARTICLE

INCLUDING SUSTAINABILITY IN HEALTHCARE IN MEDICAL EDUCATION CURRICULUM A REVIEW

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ARTICLE INFO

Article History:

Received 29th January, 2022
Received in revised form
26th February, 2022
Accepted 19th March, 2022
Published online 28th April, 2022

Keywords:

Sustainability, sustainable health care.

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ABSTRACT

Aim: To review current articles advocating the integration of sustainable healthcare in medical education curriculum. **Context:** The concepts of innovation in healthcare sustainability are relatively new in medical education. It focuses on long-term health promotion, wellness, and wellbeing in order to lighten the burden on the healthcare system. Medical schools can serve as a breeding ground for the development of knowledge, skills, and innovation to address environmental challenges through innovative and collaborative approaches. **Material and method:** Few articles were reviewed for application of sustainability in medical education curriculum. Findings and inference: When the concept is integrated into the medical curriculum, young minds will embrace it and work toward attainable sustainability goals. **Inference:** The following are some of the topics that will be addressed in the curriculum and which future doctors should be able to do: 1. Evaluate the clinical and cost effectiveness of therapies and select investigations based on cost effectiveness. Work to make such approaches more innovative. 2. Procedures and infrastructure that are environmentally friendly. 3. Nutrition in connection to individual patients and societies, which may provide some possibility for sustainable healthcare education. 4. Recognize the effects of global and climate change. 5. "Seeking strategies to consistently enhance the usage and prioritization of resources" is part of patient safety and quality improvement. 6. Recognize how therapy and care can add to a patient's burden and make decisions to alleviate it where possible, especially when the patient has several diseases or is towards the end of life." 7. Diagnosis and medical management. Doctors who qualify should be able to apply sustainable healthcare ideas to their medical practice. Inclusion of teaching sustainability in medical education to add a new dimension to future learning. The concepts of innovation and sustainability are relatively new in medical education. It focuses on long-term health promotion, wellness, and wellbeing in order to lighten the burden on the healthcare system.

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Citation: Shifan Khanday, "Driver Drowsiness Detection System", 2022. *International Journal of Current Research*, 14, (04), 21227-21230.

INTRODUCTION

The concepts of innovation in healthcare sustainability are relatively new in medical education. It focuses on long-term health promotion, wellness, and wellbeing in order to lighten the burden on the healthcare system. "Medical schools can serve as a breeding ground for the development of knowledge, skills, and innovation to address environmental challenges through innovative and collaborative approaches" (Walpole and Mortimer, 2017). This concept is also advocated and elaborated in the United States through a Delphi study, which concludes by proposing that physicians advocate for the sustainability of the healthcare systems in which they work. (Teherani *et al.*, 2017).

When the concept is incorporated into medical education, young minds will embrace it and work toward attainable sustainability goals. It provides learners with the knowledge, skills, values, and attitudes they need to make informed decisions. Once introduced in curriculum, It will equip students with the knowledge, skills, values, and attitudes they need to make informed decisions and take responsible actions for environmental integrity, economic viability, and a just society. It improves the cognitive, social, emotional, and behavioral aspects of learning. Integrating sustainable health care into health professions curricula is a critical step toward raising awareness of how the various activities of health care provision, such as procurement, high energy and water demands, and large volumes of generated waste, contribute to GHG emissions.

There is practical advice on how and when integration can occur (IFMSA 2019; Lopez-Medina *et al.* 2019; Tun 2019; Walpole *et al.* 2019; Schwerdtle *et al.* 2020), but there are several barriers. These barriers include a perception that sustainability is unimportant in health care (Richardson *et al.* 2014), a lack of educator expertise (Richardson *et al.* 2016; Tun 2019), the difficulty of incorporating yet another topic into already overburdened curricula, and a lack of existing assessment approaches. When the concept is integrated into the medical curriculum, young minds will embrace it and work toward attainable sustainability goals. The following are some of the topics that will be addressed in the curriculum and which future doctors should be able to do:

- Evaluate the clinical and cost effectiveness of therapies and select investigations based on cost effectiveness. Work to make such approaches more innovative.
- Procedures and infrastructure that are environmentally friendly.
- Nutrition in connection to individual patients and societies, which may provide some possibility for sustainable healthcare education.
- Recognize the effects of global and climate change.
- "Seeking strategies to consistently enhance the usage and prioritization of resources" is part of patient safety and quality improvement.
- Recognize how therapy and care can add to a patient's burden and make decisions to alleviate it where possible, especially when the patient has several diseases or is towards the end of life."
- Diagnosis and medical management. Doctors who qualify should be able to apply sustainable healthcare ideas to their medical practice.

REVIEW OF LITERATURE

After collecting decent knowledge about the topic, I started by reading articles that had already been published. At this point, I needed to improve my search tools and engine, so I used PubMed, NCBI, Google Scholar, Cochrane, and Taylor & Francis online databases. **Boolean Operators** (AND, OR, NOT, or AND NOT) are basic words that are used as conjunctions to combine or exclude keywords in a search, resulting in more focused and productive results. Using the keywords (using; (sustainable healthcare* OR sustainability in medical curriculum) AND (integrating sustainability) AND (medical education OR higher education)), with the word 'sustainable practice' substituted. Within chosen topic, highlight the essential topics or keywords. Identify any synonyms or alternative methods to represent the notions (related phrases, variation spellings). Organize the keywords in a way that makes sense to you (Boolean searching) Choose from a variety of databases to search.

Look for information.

Papers selected have been published recently (search restriction to the last 5 years), published English language, informative and appealing articles. You may find my search planning according to subject heading, filters, year of publication, Inclusion/exclusion criteria, truncations.

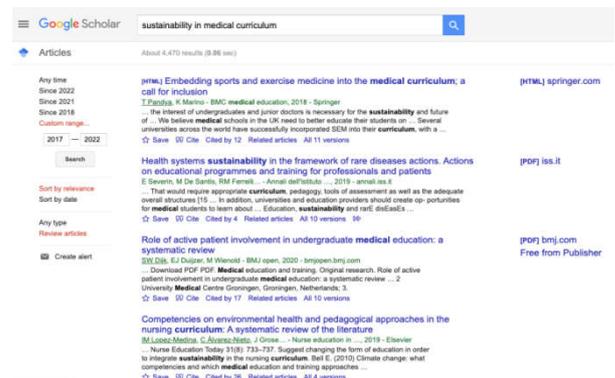
- Starting in 2022
- Starting in 2017

- Custom range...
- Sort by date
- Sort by relevance
- Any kind/open access
- Include patents and citations in review articles

Article selection

I have selected a handful that were recently published (search limited to the last 5 years), were written in English, are related to healthcare education, relevant, appealing, addressing the necessity of introducing sustainability in healthcare education. 5 articles:

This primary search allowed me to decide my Keywords:



- Emily Shaw *et al.*, (2021). AMEE Consensus Statement: Planetary health and education for sustainable healthcare. Taylor Francis online. <https://doi.org/10.1080/0142159X.2020.1860207>
- Teherani *et al.*, (2017). Identification of core objectives for teaching sustainable healthcare education. Pubmed. doi: 10.1080/10872981.2017.1386042.
- Walpole, Mortimer., (2017). Evaluation of a collaborative project to develop sustainable healthcare education in eight UK medical schools. Pubmed.gov. 150: 134-148. doi: 10.1016/j.puhe.2017.05.014
- Hategan, A., and M. Abdurrahman. (2021) "Incorporating Sustainability, Eco-Responsibility, and Educational Equity in the Medical Curriculum". Canadian Medical Education Journal, vol. 12, no. 5, pp. 68-70, doi:10.36834/cmj.71767
- Gandhi V, Al-Hadithy N, Göpfert A, Knight K, van Hove M, Hockey P. Integrating sustainability into postgraduate medical education. *Future Health J.* 2020;7(2):102-104. doi:10.7861/fhj.2020-0042

Article 1: (Emily Shaw *et al.*, (2021). AMEE Consensus Statement: Planetary health and education for sustainable healthcare. Taylor Francis online. <https://doi.org/10.1080/0142159X.2020.1860207>). Important background information: The goal of this article is to create a global, collaborative, representative, and inclusive vision for teaching an interprofessional healthcare workforce capable of providing sustainable healthcare while also promoting planetary health. Its purpose is to inform national and international accrediting standards, planning, and action at the institutional level, as well as to emphasize the role of individuals in improving health professions education. Deficiencies or other areas that require further study: This

paper provides an overview and concept of alaming of this emerging field and what benefits health care will. Proper planning and implementation is not provided for a sustainable healthcare and how to incorporate it in medical curriculum.

How does it help in establishing a study about the research problem: Graduates of health professions are ill-equipped to play a part in bringing about these improvements? To meet the 2030 Sustainable Development Goals (SDGs), health professions education must provide undergraduates and those already qualified with the knowledge, skills, values, competence, and confidence they need to promote the health, human rights, and well-being of current and future generations while also protecting the planet's health. How does it help to create a research proposal for the research problem: This research takes a comprehensive approach and can be used as a foundation for future research.

Article no 2: (Teherani *et al.*, (2017). Identification of core objectives for teaching sustainable healthcare education. Pubmed.gov.22(1):1386042. doi: 10.1080/10872981.2017.1386042.). Important background information: This article targets for the medical education continuum are proposed in this study. These goals ensure that a physician's identity includes the knowledge and skills needed to care for patients who are affected by climate and environmental factors, as well as advocate for the long-term viability of the health systems in which they operate. Deficiencies or other areas that require further study: Exactly how and what will be done to achieve is not clear. Only a qualitative analyses by interviewing people regarding the importance of implementation of sustainable health care. How does it help in establishing a study about the research problem: The preclinical years of medical school were deemed the best time to introduce 13 of the objectives, whereas the clinical years were deemed the best time to introduce six. The definition of environmental sustainability should be understood before to medical school, and post-graduate training should include identifying approaches to improve the environmental sustainability of health systems, according to respondents. How does it help to create a research proposal for the research problem: This study provides a comprehensive approach and initiative to how and when these changes should be implemented. It identifies the need of introduction of sustainability in medical curriculum in early years. Article no 3: (Walpole, Mortimer., (2017). Evaluation of a collaborative project to develop sustainable healthcare education in eight UK medical schools. Pubmed.gov. 150: 134-148. doi: 10.1016/j.puhe.2017.05.014)

Important background information: The objectives of this study were to (1) explore drivers and challenges of collaboration for educational development between and within medical schools; (2) evaluate the effectiveness of a range of pedagogies for sustainable healthcare education; and (3) identify effective strategies to facilitate the renewal of medical curricula to address evolving health challenges. Medical school teams participated in a nine-month collaborative project, including a one-day seminar to learn about sustainable healthcare education and develop a project plan. After the seminar, teams were supported to develop, deliver and evaluate new teaching at their medical school. Deficiencies or other areas that require further study: This paper provides an overview of this emerging field and what benefits higher education institutions can expect. How does it help in establishing a study about the research problem: new teaching was introduced at seven medical schools. A variety of

pedagogies were represented. Collaboration between schools motivated and informed participants. The main challenges faced related to time pressures. Educators and students commented that new teaching was enjoyable and effective at improving knowledge and skills. How does it help to create a research proposal for the research problem: This study addresses a comprehensive approach and considered a platform for teaching sustainability in future. Article no 4: (Hategan, A., and M. Abdurrahman. (2021) "Incorporating Sustainability, Eco-Responsibility, and Educational Equity in the Medical Curriculum". Canadian Medical Education Journal, vol. 12, no. 5, pp. 68-70, doi:10.36834/cmej.71767).

Important background information: support physician efforts to assist patients in making effective choices to ensure high-quality care, may create an opportunity for physicians to lead the effort to maximize the use of valuable healthcare resources. This article talks about environmental stewardship. Deficiencies or other areas that require further study: article claims to give guidelines for incorporating sustainability in health care but concludes only but saying how to reduce paper burden and shift to digital activities.

How does it help in establishing a study about the research problem: Digitalization of curriculum is mentioned how to achieve is again a bigger question. An overview of possibilities have been drafted which can help in future planning. How does it help to create a research proposal for the research problem: It claims how much carbon footprint is in Canada due to healthcare wastage which creates environmental threat. It acknowledges the importance of ecology maintenance and benefits of teaching this is medical schools. Article no 5: (Gandhi V, Al-Hadithy N, Göpfert A, Knight K, van Hove M, Hockey P. Integrating sustainability into postgraduate medical education. *Future Healthc J.* 2020;7(2):102-104. doi:10.7861/fhj.2020-0042)

Important background information: Using the five principles of sustainable clinical practice, professionals can strive to improve sustainable healthcare delivery even where the link to carbon footprint is less obvious. While this topic has recently been introduced into the undergraduate medical curriculum, postgraduate education has not yet caught up. Due to logistical constraints and trainers' unfamiliarity with the topic, existing postgraduate educational frameworks such as additional curricular items assessed via electronic portfolios are unlikely to be an ideal platform for the incorporation of sustainability teaching. Deficiencies or other areas that require further study:

This paper provides an overview of this emerging field and what benefits higher education institutions can acquire by reducing carbon footprint and helping ecosystem which is very discrete ,why only at medical college and not at school these topics should be introduced is not mentioned. A global crises has been addressed and why only future healthcare is dependent on a new course and not on already existing community medicine course couldn't be explained well. How does it help in establishing a study about the research problem: Using the examples provided by the existing case studies, it looks at how could solve potential problems in global climate changes in and what benefits that could be gained. How does it help to create a research proposal for the research problem: This study provides a comprehensive approach and considered a platform for future.

RESULTS AND INFERENCE

Based on my review of the literature, I also propose the inclusion of teaching sustainable healthcare in medical education to add a new dimension to future learning. The concepts of innovation and sustainability are relatively new in medical education. It focuses on long-term health promotion, wellness, and wellbeing in order to lighten the burden on the healthcare system. Some of the questions that will be addressed in the curriculum and that future doctors should be able to answer are as follows:

How to assess the clinical and cost-effectiveness of therapies and choose investigations based on cost-effectiveness. Make an effort to make such approaches more innovative. What will be the environmentally friendly procedures and infrastructure?. "Seeking strategies to consistently improve resource utilization and prioritization," which is part of patient safety and quality improvement. Recognize how therapy and care can increase a patient's burden and make decisions to reduce it where possible, especially if the patient has multiple diseases or is nearing the end of life." How diagnosis and medical management will change once such additions are made to the curriculum. In a nutshell, future doctors should be able to apply sustainable healthcare to their medical practice while also committing to global excellence.

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