

Environmental Awareness and Sustainable Behavior in the Nursing Field: A Scoping Review Based on Nola Pender's Theory

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Theme: Health, well-being, and quality of life promotion

Contribution to the field: Nurses perform a vital role in mitigating the effects of climate change by promoting nursing practice in sustainable environments. This review delves into the environmental awareness of nursing professionals, supporting practice based on the principles of Nola Pender's health promotion theory, which contributes to the development of more conscious and responsible nursing practice from an environmental perspective.

Abstract

Introduction: Climate change is a global threat that impacts health, well-being, and healthcare systems. In this context, nursing holds a key role in promoting health and environmental sustainability. **Objective:** To map the existing evidence related to environmental awareness and sustainable behavior in nursing practice from the perspective of Nola Pender's health promotion theory. **Materials and Methods:** A scoping review following the guidelines of Arksey and O'Malley and the Joanna Briggs Institute. The search used the following key terms: "Nursing" AND "Environmental Sustainability" AND "Sustainable Behaviors" in PubMed and Scopus. Articles in English and Spanish from the last five years were included. Preselection was based on the reading of the title, abstract, and introductory text; the selected studies covered areas of nursing practice. **Results:** Seven articles from Africa, Asia, and Europe met the criteria of this review, of which five were quantitative, one was qualitative, and one was mixed. Pender's theory applied to nursing and environmental sustainability highlights the influence of cognitive, interpersonal, and environmental factors on nurses' pro-ecological behavior. The environmental awareness of nursing professionals is a key factor in the adoption of sustainable practices; however, there are barriers that hinder the effective implementation of such practices. **Conclusions:** The findings highlight the importance of measuring and improving attitudes toward sustainability with validated tools, which would favor a sustainable and efficient work environment.

Keywords (Source: DeCS)

Environmentalism; nursing; practical nursing; health promotion; review.

4 Conciencia y comportamiento ambiental sostenible en enfermería: revisión de alcance desde la teoría de Nola Pender

Resumen

Introducción: el cambio climático es una amenaza global que impacta la salud, el bienestar y los sistemas sanitarios. En este contexto, la enfermería juega un papel clave en la promoción de la salud y la sostenibilidad ambiental. **Objetivo:** mapear la evidencia existente relacionada con la conciencia y el comportamiento ambiental sostenible en la práctica de enfermería bajo la mirada de la teoría de la promoción de la salud de Nola Pender. **Material y método:** revisión de alcance conducida por las orientaciones de Arksey y O'Malley y el Instituto Joanna Briggs. La búsqueda utilizó los términos clave: "Nursing" AND "Environmental Sustainability" AND "Sustainable Behaviors" en PubMed y Scopus. Se incluyeron artículos en inglés y español de los últimos cinco años. La preselección se dio mediante lectura de título, resumen y texto introductorio; los estudios seleccionados se enfocaron en áreas de la práctica enfermera. **Resultados:** siete artículos provenientes de África, Asia y Europa respondieron a los objetivos de esta revisión, cinco cuantitativos, uno cualitativo y uno mixto. La teoría de Pender aplicada a la enfermería y la sostenibilidad ambiental destaca la influencia de factores cognitivos, interpersonales y ambientales en el comportamiento proecológico de las enfermeras. La conciencia ambiental de los profesionales de enfermería es un factor clave para la adopción de prácticas sostenibles; sin embargo, existen barreras que dificultan la implementación efectiva de dichas prácticas. **Conclusiones:** los hallazgos destacan la importancia de medir y mejorar las actitudes hacia la sostenibilidad con herramientas validadas, lo que favorecería un entorno de trabajo sostenible y eficiente.

Palabras clave (Fuente DeCS)

Ambientalismo; enfermería; enfermería práctica; promoción de la salud; revisión.

Consciência e comportamento ambiental sustentável na enfermagem: uma revisão de escopo da teoria de Nola Pender

Resumo

Introdução: As mudanças do clima são uma ameaça global que afeta a saúde, o bem-estar e os sistemas de saúde. Nesse contexto, a enfermagem desempenha um papel fundamental na promoção da sustentabilidade ambiental e da saúde. **Objetivo:** mapear as evidências existentes relacionadas à conscientização e ao comportamento ambiental sustentável na prática de enfermagem sob o olhar da teoria da promoção da saúde de Nola Pender. **Materiais e métodos:** revisão de escopo conduzida segundo as orientações de Arksey e O'Malley e do Instituto Joanna Briggs. A busca utilizou os termos-chave: “Enfermagem” AND “Sustentabilidade ambiental” AND “Comportamentos sustentáveis” de PubMed e Scopus. Foram incluídos artigos em inglês e espanhol dos últimos cinco anos. A pré-seleção se deu por meio da leitura do título, do resumo e do texto introdutório. Os estudos selecionados focaram áreas da prática de enfermagem. **Resultados:** sete artigos da África, da Ásia e da Europa responderam aos objetivos desta revisão, sendo cinco quantitativos, um qualitativo e um misto. A teoria de Pender aplicada à enfermagem e à sustentabilidade ambiental destaca a influência de fatores cognitivos, interpessoais e ambientais no comportamento pró-ecológico dos profissionais de enfermagem. A consciência ambiental destes é um fator fundamental para a adoção de práticas sustentáveis; no entanto, existem barreiras que dificultam a implementação efetiva de tais práticas. **Conclusões:** Os resultados destacam a importância de medir e melhorar as atitudes em relação à sustentabilidade com ferramentas validadas que favoreçam um ambiente de trabalho sustentável e eficiente.

Palavras-chave (Fonte DeCS)

Ambientalismo; enfermagem; enfermagem prática; promoção da saúde; revisão.

Introduction

Climate change is causing serious and irreversible damage to both ecosystems and human communities, threatening environmental sustainability and posing a growing concern for all societies and global economies (1). Environmental scientists have emphasized the urgency of adopting global measures and have advocated for a drastic reduction in carbon dioxide (CO₂) emissions, positioning environmental sustainability as one of the greatest challenges facing contemporary society (2).

At the general level, there has been an alarming increase in critical climate events, including extreme temperatures, droughts, desertification, floods, forest fires, and reduced access to water resources due to pollution (3-5). These climate phenomena suggest that almost one-fifth of the planet will be excessively hot for humans by 2070 (6).

Climate change poses a vital threat, affecting the physical environment as well as all aspects of natural and human systems, including social and economic conditions, the functionality of health systems, and human health (7). In this latter regard, its multiple effects on human health have been documented, such as an increase in infectious diseases, respiratory disorders, heat-related morbidity and mortality, and malnutrition due to food insecurity (8-9). Consequently, with the worsening of these health impacts, compounded by other coexisting crises, populations worldwide are increasingly relying on health systems as their first line of defense (10).

From this perspective, sustainability has become particularly relevant in the field of healthcare, being included in the global health agenda by the World Health Organization and the United Nations, which reflects its importance in the Sustainable Development Goals for 2030 (11). To move toward these goals, collaborative interprofessional efforts are required, as well as changes in high-level policies and decisions.

In this context, sustainability knowledge is closely related to awareness of the theoretical aspects of sustainable development, while attitudes toward sustainability refer to concern for this issue, translated into sustainable behaviors (12). Thus, behavior toward sustainability entails actions that support and contribute to sustainable development.

As expressed in various conceptual frameworks and models, the environment is one of the core elements of nursing care. However, individual nurses and professional associations, such as the International Council of Nurses, report gaps in their training to address issues related to sustainability and climate change, highlighting the need for these topics to be included in the professional curriculum (13-14). In addition, nurses themselves do not perceive their role in adapting to this phenomenon, and many are unaware of aspects of these changes (15).

Despite this lack of awareness and training weaknesses, nursing professionals unconsciously and indirectly work on the front lines to mitigate climate change (reduce or prevent greenhouse gas emissions) and achieve better climate adaptation (reduce vulnerability to harmful effects), just as they are committed to protecting and promoting the health of their patients (14).

Moreover, some authors assert that nurses have essential advantages in this field compared to other healthcare professionals. First, nurses constitute approximately 60 % of healthcare personnel worldwide. Second, nurses are trustworthy, as they are often the first healthcare provider people meet when seeking care. And third, they are close to the people most vulnerable to climate change (16-17).

Furthermore, in their own workplaces, nurses contribute to reducing greenhouse gas emissions by decarbonizing their work practices, thereby fulfilling an essential role in community education on climate change and the implementation of sustainable environmental practices (15).

Faced with this situation, the health sector, and particularly nurses, are essential in responding to sustainability issues (18-19), as they are agents of change capable of improving public health and managing health resources effectively.

Consequently, based on these approaches, this study conducts a literature review to comprehensively map and analyze the existing evidence on sustainable behaviors in nursing practice, with a particular focus on their relationship with the environment to answer the question: What is the level of environmental awareness and sustainable behavior among nurses?

The review is conducted under the disciplinary scope of Nola Pender's health promotion theory (20), a conceptual theoretical model that allows for the identification of behavioral patterns and practices that promote sustainability within the nursing profession. The model is a proposal to integrate nursing theories with behavioral sciences, based on the concept of health promotion (21). It has been used by nurses to understand healthy behaviors and develop health promotion actions that bring significant benefits to people's quality of life. The aim is to base the concept of health promotion on actions that maintain or enhance the well-being of the individual. The model provides a solid foundation for clinical nursing practice, enabling the planning and implementation of interventions and the evaluation of actions.

In the global context of greenhouse gas emissions, Chile accounts for a total of 5.46 million metric tons of CO₂ equivalent to gross emissions in the health sector. When compared to other countries globally, it ranks 33rd among the 68 countries analyzed in a study (22). In other words, it is in an intermediate position in

the world ranking. Although it is not one of the main emitters, the country’s emissions are still significant for the environment and climate change. This analysis highlights the urgent need for Chile to strengthen its carbon emission reduction policies and strategies (23). Despite its intermediate position, the country has a responsibility to commit to global sustainability efforts and to meet the international targets set to mitigate the effects of climate change. For this purpose, a roadmap has been developed that establishes the following key areas: a) committing to zero-emission healthcare; b) linking zero-emission healthcare with health equity and climate resilience; c) promoting cross-cutting actions that integrate climate and health; and d) communicating and activating, thereby training healthcare professionals as leaders in the fight against climate change.

Materials and Methods

This study is a scoping review, based on the methodological framework proposed by Arksey and O’Malley (24) and the Joanna Briggs Institute (25), with the aim of mapping the existing evidence related to environmental awareness and sustainable behavior in nursing practice. The literature review is specific to this theme and to research its use as a process in the context of global nursing.

The search was completed in December 2024. The search terms included the keywords: “Nursing” AND “Environmental Sustainability” AND “Sustainable Behaviors”, which were used in the PubMed and Scopus databases to retrieve literature. The limits applied were articles in English and Spanish, and publication period, limiting the search to articles published within the last five years. The pre-defined inclusion and exclusion criteria are shown in Table 1.

Table 1. Search Inclusion Criteria

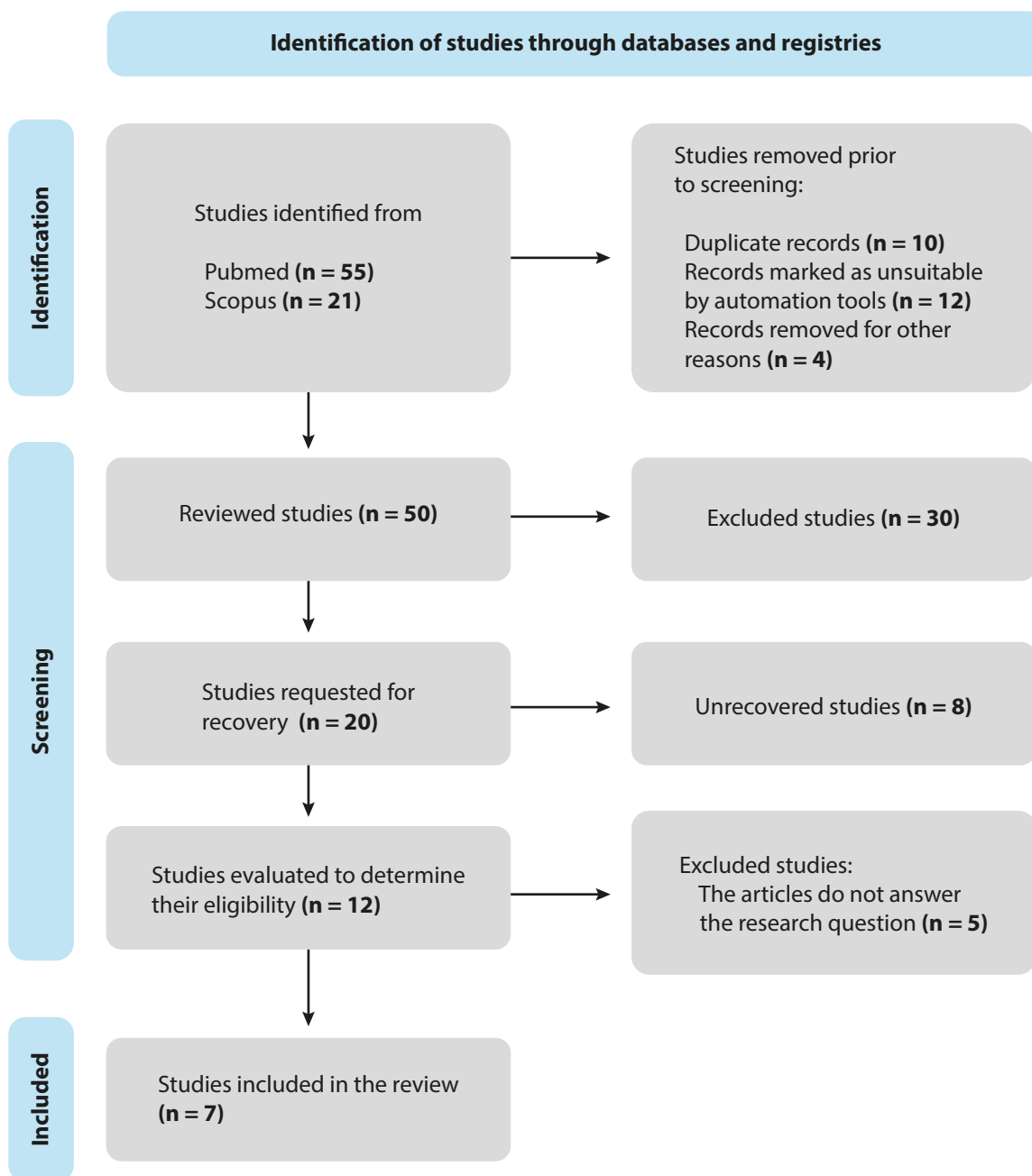
Domains	Inclusion
Sample	Studies that included nurses in a healthcare setting.
Phenomenon of interest	Nurses’ awareness and behaviors regarding climate change and sustainable practices in healthcare organizations.
	Barriers and facilitators for the implementation of sustainable practices in nursing in healthcare settings.
Design	Studies that directly analyze nurses’ sustainable practices, attitudes, and barriers.
Evaluation	Studies evaluating nurses’ environmental awareness and behaviors toward climate change in healthcare settings.

Source: Prepared by the authors.

The selection process for sources was conducted following a clear and transparent protocol. Each phase of the process is documented to illustrate the selection process. The flow includes:

- *Initial identification*: review of titles and abstracts to remove articles that do not meet the inclusion criteria.
- *Evaluation*: selection of articles based on inclusion and exclusion criteria, which proceed to the next stage.
- *Duplicate exclusion*: removal of duplicate records.
- *Full-text retrieval*: obtaining the full articles of studies that meet the criteria.

Figure 1. Flowchart for Article Selection according to PRISMA Guidelines



Source: Prepared by the authors.

For the theoretical analysis, an interpretive matrix was designed based on the main constructs of the health promotion model: personal, cognitive, affective, and interpersonal factors, as well as the influence of the physical and social environment. Using this structure, the contents of each article included in the sample were reviewed to identify whether there was explicit or implicit mention of these factors and how they related to sustainable environmental behaviors. The recommendations presented stem from this triangulation between the findings of the articles and the elements of the model, which allows for the development of practical guidelines based on theory.

The data extraction process was conducted systematically, and data tables were created. Each selected article was screened to establish the following key data: a) author(s) and publication year; b) study objective; c) study design; c) population and context; d) main findings related to sustainable behaviors and environmental sustainability in nursing. This analysis is narrative and was organized according to the following aspects: a) summary of the included studies, with a descriptive presentation of the studies and their findings; b) identification of sustainable nursing behaviors and their impact on environmental sustainability; c) comparative analysis of the studies conducted and their relationship with the application of the health promotion theory.

Regarding the ethical aspects of the study, the research did not include interventions on human subjects, nor did it involve the handling of sensitive data. Therefore, as only public and open-access data were used, no evaluation by a scientific research ethics committee was requested for the handling of the data or the execution of the study.

Results

The final sample of the scoping review consisted of seven scientific publications. When reviewing their methodological characteristics, most correspond to articles with quantitative designs (71.4 %), only one with a qualitative design (14.2 %), and one with a mixed design (14.2 %). Regarding the country of origin, two originate from Egypt, two from South Korea, and the rest from China, Spain, and Italy, with most of them published in 2024.

Table 2 presents a summary of all the articles included in this review, organized by author, year, country, objective, method, and results obtained in each. The studies vary in their approach and methodology, but, in general, they show that nurses' ecological behaviors are closely related to factors such as environmental awareness, ethical leadership, motivation, positive future cognition, and organizational culture.

Table 2. Descriptive Presentation of the Studies

Author, year, country	Objective	Design	Results and conclusion
Atalla <i>et al.</i> (26) 2024 Egypt	To explore the relationship between prosocial leadership behaviors and nurses' awareness of sustainability and to demonstrate the mediating role of organizational culture in this relationship.	Quantitative, descriptive, correlational, cross-sectional	A total of 85.7 % have a high perception of prosocial leadership and 60.9 % show high awareness of sustainability. There is a positive correlation between prosocial leadership, organizational culture, and sustainability awareness.
Bartoli <i>et al.</i> (27) 2024 Italy	To explore environmental sustainability-related behavior in intensive care nurses.	Qualitative, content analysis	Sustainability was associated with waste management. Logistical difficulties in ICUs were mentioned, such as the risk of infection and lack of regulation.
Chung <i>et al.</i> (28) 2024 South Korea	To validate the SANS-2 tool for measuring attitudes toward sustainability.	Quantitative, cross-sectional	SANS-2 is valid and reliable for measuring attitudes toward sustainability. Nurses with high scores were more likely to have positive attitudes toward sustainability and climate change.
Chung <i>et al.</i> (29) 2024 South Korea	To explore how cognition influences sustainability behaviors.	Quantitative, cross-sectional	The attitudes toward environmental sustainability were higher in women ($p=0.022$). Awareness, concern, and motivation were significantly correlated with attitudes toward sustainability ($p<0.001$).
Li <i>et al.</i> (30) 2021 China	To explore the relationship between green behavioral intentions and ethical leadership.	Quantitative, cross-sectional	The effect of green behavioral intentions was significant only at a high level of ethical leadership ($p<0.01$). Ethical leadership influences pro-ecological behaviors.
Luque-Alcaraz <i>et al.</i> (31) 2024 Spain	To examine environmental awareness and behavior.	Mixed, sequential	A total of 70.4 % showed moderate environmental awareness and environmental behavior, while 47.77 % participated in pro-ecological actions. Their behavior depended on actions outside of work and knowledge.
Moustafa <i>et al.</i> (32) 2024 Egypt	To research the impact of the educational intervention regarding green transformational leadership on the green behavior and creativity of nursing managers.	Quantitative, quasi-experimental	After the educational intervention, there was a significant improvement in knowledge regarding green transformational leadership ($p < 0.001$).

Source: Prepared by the authors.

Table 3 summarizes the main findings prepared by the authors of this article, based on the interpretation of the results of each study in light of Pender’s model.

Table 3. Pender’s Theory and Guidelines for Sustainable Practices in Nursing

Study	Application of Pender’s theory	Guidelines
Atalla <i>et al.</i> (26) 2024 Egypt	Prosocial leadership fosters a positive social environment. The theory suggests that leadership and social environment are essential for the adoption of sustainable behaviors.	To promote transformational leadership and an organizational environment conducive to sustainability.
Bartoli <i>et al.</i> (27) 2024 Italy	Pender’s theory applied to the study of environmental sustainability in ICU nurses considers that personal, interpersonal, and environmental factors influence behaviors. Nurses who are aware of the environmental effects of their practices are more likely to adopt sustainable behaviors.	To promote environmental awareness among ICU nurses in order to encourage more sustainable practices in their work environment.
Chung <i>et al.</i> (28) 2024 South Korea	The use of tools to measure attitudes aligns with Pender’s theory, which highlights the importance of self-efficacy and awareness in health-related decision-making.	To integrate tools such as SANS-2 into educational programs to raise awareness and promote pro-ecological behaviors.
Chung <i>et al.</i> (29) 2024 South Korea	Positive future cognitions and motivation are essential for behavioral change. Pender points to the positive future, a key concept in health promotion theory, which refers to the anticipation of future benefits stemming from the adoption of healthy behaviors.	The promotion of positive motivation is a long-term benefit of sustainability in encouraging pro-ecological behaviors.
Li <i>et al.</i> (30) 2021 China	Contextual factors (ethical leadership) influence the organizational environment and the way individuals make health decisions. Social support and motivation are key elements in creating an environment that encourages ecological behavior.	To strengthen ethical leadership in institutions to create an environment that facilitates green behavior.
Luque-Alcaraz <i>et al.</i> (31) 2024 Spain	Environmental awareness (cognitive factors) influences pro-ecological behavior in the workplace. Contextual and workplace factors affect the adoption of sustainable practices.	The improvement of environmental education and the provision of a work environment that supports sustainability could lead to an increase in pro-ecological behavior.
Moustafa <i>et al.</i> (32) 2024 Egypt	The theory highlights the importance of self-efficacy and decision-making when adopting behaviors. Nurses with greater knowledge and understanding of ecological transformational leadership showed more proactive behavior toward sustainability.	To develop educational programs in ecological transformational leadership to increase nurses’ capacity to implement sustainable ecological practices.

Source: Prepared by the authors.

Table 4 presents a comparative analysis highlighting the sustainable behaviors seen in nurses, the sustainable practices implemented in organizations, and their impact on health outcomes, nursing practice, and organizational sustainability.

Table 4. The Impact of Sustainable Nursing Practices and Organizational Sustainability

Study	Sustainable practices	Sustainable behaviors	Impact on nursing practice	Impact on organizational sustainability
Atalla <i>et al.</i> (26) 2024 Egypt	Prosocial leadership and sustainability awareness	The impact of prosocial leadership behaviors on nurses' sustainability awareness through organizational culture is a mediating factor.	Prosocial leadership fosters an organizational culture that supports sustainability, which improves efficiency in the implementation of green practices in nursing.	Prosocial leadership improves organizational culture and sustainability awareness, thereby enabling a more structured approach to achieving sustainability goals at the institutional level.
Bartoli <i>et al.</i> (27) 2024 Italy	Waste separation and management, sustainable practices in the ICU	ICU managers should propose and verify sustainable behaviors by creating sustainability teams and promoting a positive work environment.	Intensive care nurses face logistical challenges when implementing sustainable practices, which affects the efficiency of care. Training in sustainability could improve this scenario.	The lack of regulation in sustainability can hinder the uniform implementation of practices, affecting organizational sustainability.
Chung <i>et al.</i> (28) 2024 South Korea	The use of the Sustainability Attitudes in Nursing Survey-2 to measure attitudes toward sustainability	Attitudes toward environmental sustainability and identifying educational needs could help formulate more practical interventions or educational programs, including continued education, and create a more environmentally sustainable workplace.	The validation of SANS-2 helps measure and promote positive attitudes toward sustainability in nursing, which can improve the quality and efficiency of care.	Measuring and promoting sustainable attitudes through a validated tool reinforces organizational policies that favor environmental sustainability in the field of healthcare.
Chung <i>et al.</i> (29) 2024 South Korea	Attitudes toward environmental sustainability and cognition	It is necessary to explore nurses' opinions on environmental sustainability, including their perception of the workplace culture as supportive of environmental sustainability and whether they believe there are sufficient resources or adequate equipment to support related behaviors.	Knowledge and motivation toward sustainability influence the adoption of sustainable practices, which can improve the efficiency of nursing work.	Positive attitudes toward sustainability can contribute to a more sustainable organizational environment, encouraging policies that promote green practices.
Li <i>et al.</i> (30) 2021 China	Green commitment influenced by ethical leadership	Environmental ethics in hospitals, promoted by leaders, is crucial for environmental performance, integrating environmental protection practices and social responsibility into the organizational culture.	Ethical leadership strengthens intentions to engage in green behavior, resulting in greater efficiency in the implementation of sustainable practices by nursing personnel.	Ethical leadership within the organization strengthens the culture of sustainability, creating a favorable environment for sustainable healthcare practices.

Study	Sustainable practices	Sustainable behaviors	Impact on nursing practice	Impact on organizational sustainability
Luque-Alcaraz <i>et al.</i> (31) 2024 Spain	Environmental awareness and pro-ecological actions in the workplace	Nurses with greater environmental awareness engage in more practices such as waste reduction, energy conservation, and responsible shopping ($p < 0.05$).	Moderate environmental awareness among nurses implies that sustainable practices are not implemented uniformly, which can reduce efficiency and well-being in the workplace.	Areas for improvement were identified, such as a lack of participation in sustainable actions, which may affect the organizational culture towards sustainability.
Moustafa <i>et al.</i> (32) 2024 Egypt	Training in ecological transformational leadership (green transformational leadership), educational intervention	The nurses showed that transformational leadership increased statistically significantly with the implementation of post-intervention strategies.	Ability to implement innovative solutions related to sustainability.	Nurse managers who are well-trained in ecological transformational leadership can significantly influence hospital sustainability.

Source: Prepared by the authors.

Discussion

This scoping review explores the available evidence on environmental awareness and sustainable behaviors in the nursing field and analyzes, based on the objectives of the studies, the impact of practices and the relevance of applying Pender’s theory.

In terms of environmental awareness and sustainable behaviors, various authors highlight the relationship between environmental awareness and the adoption of sustainable practices. For instance, Luque-Alcaraz *et al.* (31) study how environmental awareness influences the implementation of ecological practices in the workplace. On the other hand, Atalla *et al.* (26) provide an innovative approach by introducing prosocial leadership as a mediator in organizational culture, facilitating the development of sustainability awareness among nurses. This highlights the importance of contextual and organizational factors in promoting pro-environmental behaviors, emphasizing that leadership and institutional culture have a crucial role in implementing sustainable practices in the healthcare field.

Meanwhile, Chung *et al.* (28) emphasize continued education and a sustainable healthcare system, Bartoli *et al.* (27) focus on strategies such as creating sustainability teams to promote a good work environment, and Li *et al.* (30) introduce environmental ethics as a crucial perspective, integrating environmental protection practices and social responsibility into organizational culture.

The impact analysis of sustainable nursing practices by Luque-Alcaraz *et al.* (30) stands out, as they find that moderate environmental awareness among nurses means that sustainable practices are not implemented uniformly, which can reduce efficiency and

well-being in the workplace. Meanwhile, for Chung et al. (28), knowledge and motivation toward sustainability influence the adoption of sustainable practices, which can improve the efficiency of nursing work.

In terms of leadership, Atalla et al. (26) refer to prosocial leadership as a promoter of an organizational culture that supports sustainability, which improves the efficiency of green practices in the field of nursing. Li et al. (30) show that ethical leadership strengthens green behavior intentions, which translates into greater efficiency in the implementation of sustainable practices by nursing personnel. In turn, Bartoli et al. (27) highlight the issue in critical healthcare systems and its impact on care efficiency.

Regarding the relevance of the practical application of Pender's theory in the studies under discussion, the article by Luque-Alcaraz et al. (31) highlights environmental awareness and pro-ecological behavior at work. Li et al. (30) discuss ethical leadership and its influence on organizations, while Atalla et al. (26) mention leadership and the adoption of sustainable behaviors, showing that Pender anticipated the benefits of adopting healthy behaviors. Finally, Chung et al. (28) developed an instrument to measure attitudes, based on Pender's theory, highlighting self-efficacy and awareness in health-related decision-making.

A relevant finding of this study is the influence of ethical and prosocial leadership on the adoption of sustainable behaviors among nurses. This type of leadership, based on ethical values and a commitment to the common good, is presented as a key factor in promoting sustainable practices within the healthcare sector. Nurses, as central actors in healthcare and resource management, have the capacity to significantly influence the adoption of behaviors that promote sustainability at both the individual and organizational levels.

Furthermore, effective and reliable leadership within the health community could be a crucial element in reversing concerning trends related to climate change and public health (33). In fact, the well-being, health, and survival of populations must become central priorities on global political and financial agendas. For this purpose, the active inclusion of healthcare professionals at all levels of decision-making on climate change is essential. This participation would ensure the adequate allocation of resources and efforts, directing them toward activities that promote public health and reduce the negative impacts of climate change, rather than continuing to allocate them to sectors that threaten human health.

In turn, the importance of a supportive infrastructure within work environments to promote sustainability is highlighted, a field that should be addressed more explicitly in future research.

Finally, most of the studies reviewed show that environmental awareness and self-efficacy are crucial factors for the adoption of pro-ecological practices in the healthcare field. However, there is a lack of studies exploring the external barriers that nurses face when trying to implement these sustainable practices, which represents a significant gap.

In terms of limitations, it is worth highlighting some important issues. First, by narrowing the search strategy and including only articles published within the last five years, it is highly probable that a significant number of publications that would have added greater interpretative richness to the analysis presented were not included. Another significant limitation was the exclusion of some potential articles that could have been analyzed but were not available in open access, meaning that their content could not be accessed. Finally, a third restriction was limiting the search to articles published in English and Spanish, excluding Portuguese, which may explain why no articles published in Brazil were found, a country renowned for its enormous environmental biodiversity and vulnerability to the effects of climate change, and where studies on the theme applied to nursing practice have probably also been conducted but were not identified.

It is recommended that future research should employ more robust and homogeneous designs, which would allow for a more in-depth and generalizable analysis of sustainability interventions in nursing practices.

Conclusion

This scoping review found limited literature on the topic, with only seven articles meeting the inclusion criteria. The findings provide an answer to the research question, demonstrating that sustainable behaviors exist in nursing practice, mainly associated with prosocial leadership, environmental awareness, and education for sustainability, as well as organizational practices such as waste management and efficient use of resources.

Through the application of Nola Pender's health promotion model, it was possible to analyze how cognitive, interpersonal, and environmental factors influence the behaviors adopted by nursing professionals. The role of awareness, self-efficacy, and ethical leadership as key facilitators is highlighted. Although limited in the number of articles reviewed, this review provides theoretical and practical evidence on how nursing can promote an organizational culture oriented toward sustainability in its work environments, but further training and institutional support are still needed to overcome structural barriers.

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