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# Sustainability in nursing: a concept analysis

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## Sustainability in nursing: a concept analysis

**Aim:** The aim of this study was to describe, explore and explain the concept of sustainability in nursing.

**Background:** Although researchers in nursing and medicine have emphasised the issue of sustainability and health, the concept of sustainability in nursing is undefined and poorly researched. A need exists for theoretical and empirical studies of sustainability in nursing.

**Design:** Concept analysis as developed by Walker and Avant.

**Method:** Data were derived from dictionaries, international healthcare organisations and literature searches in the CINAHL and MEDLINE databases. Inclusive years for the search ranged from 1990 to 2012. A total of fourteen articles were found that referred to sustainability in nursing.

**Results:** Sustainability in nursing involves six defining attributes: ecology, environment, future, globalism, holism and maintenance. Antecedents of sustainability require climate change, environmental impact and

awareness, confidence in the future, responsibility and a willingness to change. Consequences of sustainability in nursing include education in the areas of ecology, environment and sustainable development as well as sustainability as a part of nursing academic programs and in the description of the academic subject of nursing. Sustainability should also be part of national and international healthcare organisations. The concept was clarified herein by giving it a definition.

**Conclusion:** Sustainability in nursing was explored and found to contribute to sustainable development, with the ultimate goal of maintaining an environment that does not harm current and future generations' opportunities for good health. This concept analysis provides recommendations for the healthcare sector to incorporate sustainability and provides recommendations for future research.

**Keywords:** concept analysis, nursing, nursing theory, sustainable development, sustainability.

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## Introduction

This paper presents a concept analysis of sustainability and its implications for nursing. Within the international community, sustainability has become a widely used concept that is incorporated into the discussion of how healthcare systems should be designed in the future. The World Health Organization (WHO) (1) argues that the existing climate change will affect the ability to maintain good health, and healthcare systems should thus take climate change and its implications seriously. Consequently, working towards sustainable development is crucial for the healthcare sector and for society in general (1–3). We argue that the concept of sustainability in nursing is vague and underexplored and has not been conceptualised.

## Background

A consensus exists that current climate change is caused by humans and originates in the emissions of greenhouse gases in the atmosphere. This phenomenon in turn creates climate changes that influence the frequency of extreme weather events, drought, lack of ground water, limited food availability, rising sea levels and melting of ice at the poles (4, 5). Health will be directly affected by increased air pollution, more vector-borne diseases, deforestation, the spread of harmful wastes and reduced biodiversity (6). Climate change may alter normal human development through malnutrition from decreased food supplies and exposure to increased pesticide use and harmful algal blooms (7). These events will be particularly threatening to vulnerable populations such as children, older adults, individuals with pre-existing illnesses and the poor (8).

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### Sustainability and nursing

Although many researchers in other fields have used the term sustainability to describe various ways of making

something sustainable, the term is not clearly defined and is poorly researched in nursing. The concept used to be described is multifaceted, including five components: environmental factors, sociocultural factors, financial feasibility, political commitment and organisational capacity (9).

The International Council of Nursing states that sustainable development is concerned with providing a framework whereby groups, communities and individuals have access to resources and opportunities and can exercise their rights to create infrastructures that promote healthy communities (10). Thus, sustainable development creates conditions that allow populations to meet the needs of the present without compromising the ability of future generations to meet their needs. Subsequently, nurses should support actions to reduce global warming and climate change and their associated impacts on health. Nurses should raise awareness of the health implications of climate change and should assess and address the subsequent health risks (11).

Nurses are responsible for engaging global health issues, but only limited studies have been published from a sustainability perspective; therefore, relevant theoretical and empirical studies are necessary (12–14). Goodman (15) has argued that nursing education must change radically to meet the new requirements accompanying climate change and that a need exists for a “sustainability curriculum” in nursing education.

Nurses need to perform their work in such way that the environment will be protected and preserved. Climate change and its ensuing environmental issues must be incorporated into modern healthcare management. The participation of nurses in this endeavour is important and most likely crucial. Because environmental, health and sustainable developments are vital for the international nursing community, it is also essential to determine how nursing research employs the concept of sustainability. The present paper explores and develops an explicit and common understanding of this concept to support nursing and future research.

### *Aim*

The aims of this concept analysis were to describe, explore and explain the concept of sustainability in nursing and provide a definition that facilitates the use and understanding of the concept in nursing.

## **Method**

### *Design*

The basic principles from Walker and Avant’s (16) model of a concept analysis were chosen for this analysis. This model is rigorous and systematic and is the most widely used model in the literature (17). The method consists of

eight steps used to highlight the aspects and attributes of a concept (Box 1). A concept analysis explores and “unpacks” vague concepts and is a useful method for clarifying words so that a consensus is reached regarding their meanings. In addition, a concept analysis provides precise definitions for use in theory and research.

#### **Box 1** Walker and Avant’s model of concept analysis

<i>Step</i>	<i>Subtarget</i>
1.	Select a concept. Choosing a concept for the analysis is preferably performed according to by the author’s own interest and expertise or is selected on the basis that it is crucial for our research.
2.	Determine the aims of analysis. When determining the aim of the analysis, it must be clear and concise and be possible to follow up in the next steps.
3.	Identify uses of the concept.
4.	Determine the defining attributes. This step comprises the heart of concept analysis. The goals are to choose a cluster of explanations for the term found in the data collection and to keep these explanations as brief as possible.
5.	Identify a model case. A model case is an example of the use of the concept and includes all of the defining attributes.
6.	Identify other cases/contrary cases. These cases can stand as truth in their own way but not for the analysis of the concept.
7.	Identify antecedents and consequences.
8.	Define empirical referents. The empirical references describe how the concept is utilised in research and in practice.

### *Data collection*

An extensive literature search was conducted, and all uses of the concept were examined with the following questions as a guide: What are all of the types of concepts for sustainability? Are there various ways of using the concept of sustainability? Data were derived from different sources, such as dictionaries, documents from international healthcare organisations and literature database searches.

First, common English-language dictionaries were reviewed to give the concept a deeper linguistic understanding. The substantive noun “sustainability” was not found in either the etymological or the semantic literature. Thus, the adjective “sustainable” was chosen for the lexical analysis. Next, we searched documents from the United Nations, World Health Organization, International Council of Nurses and the International Committee of the Red Cross. In addition, the European Union was included in the analysis because of its importance for legislation on healthcare issues in European countries. The documents were found through a Google search and

Libris (the Swedish university and research library search service). Finally, searches were performed in the CINAHL and MEDLINE databases using the following keywords: sustainability, sustainable, environmental, environmental health, environmental medicine, health, nursing and nursing care. The other literature, dictionaries and documents included in this work were located in Libris.

The search criteria used in CINAHL were as follows: abstract available, publication date of 1990-2012, English language and peer reviewed. In MEDLINE, the following search criteria were applied: abstract available, publication date of 1990-2012 and English language.

### Material

These criteria yielded fourteen articles. The article designs were qualitative, quantitative and theoretical. The inclusion criteria were that the articles should involve and use the concept of sustainability and that it should be possible to deduce from the text how the authors utilised the term. Both the adjective “sustainable” and the substantive noun “sustainability” were chosen as the inclusion criteria.

### Analysis method

The data were sorted, categorised and compared using a content analysis by Graneheim and Lundman (18). Each article was reviewed, and the information was extracted and organised within a matrix having three different levels of headings: meaning unit, condensed meaning unit and code (Box 2). The content analysis aimed to highlight the data sources' views and descriptions of the concept of sustainability in nursing. Through the content analysis, the procedure generated six different codes that in this study created the attributes. This procedure validated the present study because the creation of the defined attributes was based on the themes that emerged from the analysis of the texts. Thus, personal influences were reduced, and the potential for bias was minimised.

## Results

### Definitions and uses of the concept

The third step in the process involved identifying all uses of the concept in dictionaries and then the use of the concept in healthcare organisation and finally exploring the concept in the two most common nursing and medical databases.

*Dictionary definitions.* The dictionary analysis was based on two approaches: etymological and semantic. The word “sustainable” was chosen because it was not possible to retrieve the word “sustainability” in either the etymological or the semantic literature.

**Box 2** Example of Meaning unit, Condensed meaning unit and Code

Meaning unit	Condensed meaning unit	Code
Nursing initiatives throughout history involve sustainability efforts, such as improving human health within the physical, economic and social environment.// Sustainability, or sustainable development, addresses meeting the “needs for present without compromising the ability of future generations to meet their own needs”.//With its holistic perspective, nursing is well positioned to affect the future of these environments because many nursing initiatives address one or more of these environments of sustainability (34).	Sustainability addresses the UN definition of a sustainable development. With its holistic perspective, nursing is well positioned to affect the future.	UN definition/ future Holism

### Etymologic meaning

According to Walter W. Skeat's *An Etymological Dictionary of the English Language*, the origin of “sustainable” is from “sustain,” which means to hold, bear or support. The etymology of the term arises from the Latin word *sustinere*, which means “to hold” (19).

### Semantic meaning

The *Longman Dictionary of Contemporary English* defines the concept as follows: (i) able to continue without causing damage to the environment and (ii) able to continue for a long time (20, p. 1780).

In the *Oxford Advanced Learners Dictionary*, the concept is defined as follows: (i) involving the use of natural products and energy in a way that does not harm the environment and (ii) that can continue or be continued for a long time (21, p. 1548).

The *Cambridge Advanced Learner's Dictionary* has the following, similar definition: (i) able to continue over a period of time and (ii) causing little or no damage to the environment and therefore able to continue for a long time (22, p. 1471).

*Description from international healthcare organisations.* The United Nations General Assembly, World Commission on Environment and Development, also called The

Brundtland Commission, defined sustainability as “a development that meets the needs of the present without compromising the ability of future generations to meet their own need” (23, p. 43). The aims of the Commission were to examine what sustainable development means for the further development of the Earth and to develop long-term strategies for sustainability into the next century. The Brundtland Commission’s definition was indicative of future global environmental and development meetings such as the Rio conference and its document Agenda 21. Agenda 21 immerses the definition and argued that sustainable development consists of three constituent parts: environmental sustainability, sociopolitical sustainability and economic sustainability (24).

As part of the United Nations (UN), the World Health Organization (WHO) outlines the definition of sustainability in same way as the Brundtland definition. The WHO often uses the word sustainability in conjunction with “environmental” as in the Millennium Development Goal number seven: to ensure environmental sustainability (25).

The European Union has an ambiguous policy related to the concept of sustainability. The organisation has described sustainability as “accessibility, quality and financial sustainability” and “environmental sustainability”. The European Health Strategy also states, “ensuring that care systems are evidence-based is essential, both for providing high-quality treatment, and ensuring sustainability over the long term” (26, p. 3).

When the International Council of Nurses (ICN) describes the concept of sustainability, the term is used in conjunction with self-sufficiency. ICN has stated that, in the present era of global nursing shortages and global health crises, the concept of self-sufficiency/sustainability is important for developing a sustainable stock of domestic nurses (27).

According to the International Committee of the Red Cross, sustainability mainly refers to a concept involving maintenance or continuation for a long period of time; for example, “to ensure sustainability/---/‘we have set a fixed monthly payment of a thousand pesos, and a very low price per litre’” (28, p. 1).

*Descriptions from published articles.* The content analysis revealed three different perspectives on sustainability. Researchers have conceptualised sustainability as follows: (i) ecology and holism, (ii) the UN’s definition of sustainable development and (iii) the ability to continue over a period of time.

*Ecology and holism.* Ecology and holism are definitions of the concept of sustainability that are repeated in several of the included articles. Bent (29) has argued that health, culture and the environment interact in society and affect the surrounding environment. Bent (29) uses the

concept of sustainability from an ecological perspective by evaluating responses to environmental health hazards and the quality and safety of the physical environment. Other authors suggest that an ecological perspective in human society can only be created through an ecological balance in nature by focusing on the immediate environments and by appreciating the relevance of the global environment. Good health depends on efforts towards sustainable development, and this work is based on the idea that man and nature interact with one another (30–33).

St. Pierre Schneider et al. (34) argue that nursing initiatives throughout history have been applied towards sustainability because nurses strive to improve human health within the physical, economic and social environments. Because of its holistic perspective, the nursing field is well positioned to affect the future of sustainability.

*The UN definition of sustainable development.* Several of the included articles use the concept of sustainability as a part of the discussion of sustainable development and refer to the UN’s definition of sustainable development (34–36). For example, in the article by Harris et al. (36), the following sentence was found: “For the purpose of this article, the term ‘environmentally sustainable’ and ‘environmentally friendly’ are used in conjunction with that of ‘sustainable development’ because the authors believe this broad definition is incorporated in all of the previous definitions” (36, p. 102).

Sustainable hospitals, the environment surrounding these hospitals and the need for nurses (because of their health knowledge) to attain leading roles in urban sustainable planning are also discussed and linked to sustainable development (34). Nurses play vital roles in efforts to create healing healthcare environments and to discourage the healthcare industry’s negative environmental impact. Based on the UN’s definition of sustainable development, a theoretical model is presented in the article for providing nurses to address environmental and sustainability issues in health care (35).

*Able to continue over a period of time.* Several articles discussed the concept of sustainability on the basis that it will permit continuation over time (37–39). Sustainability is then synonymous with the discussion on building a partnership that will continue for some time or a service or method that will be maintained. Sustainability is mentioned as a question regarding the support that various institutions and groups provide when implementing ideas and values for evidence-based nursing and how this work should be given an opportunity to be maintained (37–39).

Keating, Thompson and Lee (40) define sustainability as follows: “to enable one to bear something, to keep from failing, to strengthen, to encourage, to keep up, to

prolong or to maintain" (40, p. 150). Sustainability on the basis that something will be strong enough to resist pressure or the use of a financial and economic definition of sustainability emerged when the authors defined sustainability as the financial power of the healthcare system (41, 42).

### *Determine the defining attributes*

The attributes of sustainability are connected to the concepts that are repeatedly presented in the data recourses used for the analysis. Each article was reviewed; the information was extracted according to Graneheim and Lundman (18) (Box 2), and the outcome of the content analysis was the defining attributes. Upon reviewing the material, it became obvious that the defining attributes of the concept of sustainability in nursing that were highlighted through the content analysis are as follows: *ecology, the environment, the future, globalism, holism and maintenance*. A brief description of each attributes follows.

*Ecology.* Ecology is a key characteristic associated with sustainability. In many dictionaries, ecology is used as a main definition of "sustainable." For example, the *Concise Oxford Dictionary of Current English* defines sustainability as "ecological development, which conserves an ecological balance by avoiding depletion of natural resources" (43, p. 1405). Ecology is also frequently employed in the research literature when using the word sustainability or when authors are discussing sustainable development, for example, ecosystemic approach (30), ecological community (29) and ecological model (31).

*Environment.* The most distinctive attribute that emerged from the literature is environment, which appears to be required, according to the definition and use of the concept. For example, "As world environmental health issues continue to grow, the nurse's opportunity to promote greening initiatives becomes an ethical duty and an expected part of the job description" (36, p. 110). The environment is also central in almost all of the definitions in dictionaries, such as defining sustainable as being able to continue without causing damage to the environment (20–22). Even the WHO uses the word "sustainability" in conjunction with "environmental" (25).

*Future.* Future is also a central word in the reviewed material. This attribute is used to indicate a responsibility to take care of the environment into the future. The UN states, "Sustainability, or sustainable development, addresses meeting 'the needs of the present without compromising the ability of future generations to meet their own needs" (34, p. 281). Furthermore, in the articles by Taylor et al. (41) and Rémond and Kalina (42), the future is a central part of the ability to continue over a period of

time, for example, through addressing sustainability to retain fully productive employee in the workplace.

*Globalism.* The concept of globalism (or the expression of thinking globally) is crucial when discussing sustainable development. Kirk (32) argues that the interactions among globalisation, the global environment and human health are clearly complex, but evidence for the current and anticipated future health impacts of global change is of such a magnitude that to view these concepts as distinct entities is inappropriate and perhaps dangerous (32, p. 67).

*Holism.* Several articles directly referred to nurses' holistic responsibilities and knowledge base (33, 34, 36). Harris et al. (36) argue that because nurses are holistic practitioners, it is critical for nurses to consider sustainability from a holistic perspective.

*Maintenance.* Keating et al. (40) have defined sustainability as follows: to maintain and to be strong enough to withstand the pressures of various types. This definition is in agreement with definitions in several dictionaries that highlight sustainability as something that is "able to continue for a long time" (20, p. 1780). Furthermore, the Red Cross notes that sustainability involves maintenance or continuation for a long period of time (28).

### *Model case*

The next step was to construct a model case that illustrates the defined attributes. The following model case was constructed by the present authors.

Susan is a nurse in a surgical unit at a hospital that has conducted an environmental impact analysis. Today, Susan's work is based on the knowledge that a healthy environment is a prerequisite for a healthy life. For the nurses in the unit, knowledge of ecology and the environment are at the core of the work on sustainability, and it is important to maintain good environmental care at all levels at the hospital. Knowledge of how nursing activities affect the environment both globally and locally is an important part of a nurse's daily work.

For Susan, everyday work is based on sustainability as part of a holistic view and of environmentally friendly practices. The nursing profession is considered to be part of the global healthcare system and is thus involved in the creation of a future built on responsibility. To reduce its climate footprint and move towards climate neutrality, the unit has reduced "standby" energy use and has installed occupancy sensor switches. Furthermore, the staff has reduced or eliminated medical waste. The most important achievement was collecting and recycling anaesthetic gases. To reduce greenhouse gas emissions associated with livestock ranching, the surgical unit practices two meat-free days every week.

### Contrary case

These cases can serve as useful examples and demonstrates an absence of sustainability in nursing.

Mary works as nurse in an obstetrical unit at a hospital. The hospital has not been modernised since it was built in the late 1960s. Mary cannot remember whether the staff ever discussed various aspects of how the obstetrical unit could be part of the process of sustainable development.

No waste reduction or recycling plan has been implemented at the hospital. Concerning medical products and drugs are disposed of in the regular garbage, and the nurses and patients are exposed to antibiotic residues on table surfaces and in the air when no closed systems for medical products are used. No reduction in food service waste has been undertaken at the hospital. Every day, the unit serves the patients food from a menu that does not include any vegetarian options, and they only provide bottled water. In most deliveries, nitrous oxide for pain relief is used. Nitrous oxide systems are outdated, but even though it is one of the most powerful greenhouse gases, no gas purification takes place before it is dissipated into the air.

### Antecedents and consequences

Antecedents are events or incidents that occur prior to sustainability. The consequences are therefore the outcome of the antecedents and the defining attributes and reveal how we should act in reality (16). Identification of antecedents and consequences may elucidate the contexts in which sustainability is used, thereby supporting the defining attributes of the concept. For attending sustainability, there must be specific antecedents. Employing the defined attributes determined from the present study revealed these main antecedents: climate change, environmental impact, environmental awareness, confidence in the future, responsibility and willingness to change.

The most significant antecedent of sustainability is *Climate change*. As a part of the UN, the Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. The IPCC argues that the climate is changing rapidly and that this change is created by humans, mainly via the emission of greenhouse gases into the atmosphere (4).

*Environmental awareness* is therefore required at all levels. Climate friendly healthcare environments constitute a target for sustainability and include the following examples: energy efficiency, green-building design, food, waste, toxins and transportation (44).

Next is the antecedent of *confidence in the future*. Working towards sustainability and sustainable development requires confidence in the future. Without confidence in the future, we have nothing to build upon. *Responsibility*

is another antecedent. A future that rests on a desire for responsibility will ensure that future generations can live on the planet Earth. This responsibility concerns the ability to attain good health. Personal responsibility exists but must be accompanied by the responsibility of both society and the governing authorities in enacting environmental codes and laws. *Willingness to change* is the concept upon which all of the above described antecedents depend. Without the willingness to change, no opportunities exist for working towards sustainability.

The following consequences were revealed: sustainability should be practised by national and international healthcare organisations and hospitals. Sustainability should be included in academic nursing programs and subject descriptions and should be combined with other subjects such as ecology, environmental medicine and global studies. Finally, the healthcare sector must participate in sustainable development (Box 3).

**Box 3** Antecedents, attributes and consequences

<i>Antecedents</i>	<i>Attributes</i>	<i>Consequences</i>
Climate change	Ecology	Sustainability should be practiced by national and international healthcare organisations and hospitals. Sustainability should be included in academic nursing programs and subject descriptions and should be combined with other subjects such as ecology, environmental medicine and global studies. The healthcare sector must participate in sustainable development.
Environmental awareness	Environment	
Confidence in the future	Future	
Responsibility	Globalism	
Willingness to change	Holism	
	Maintenance	

### Empirical referents

The empirical references describe how the concept is utilised in research and in practice. These references are important for measuring the existence of the concept in different contexts and are necessary for developing valid instruments of measurement (16). Walker and Avant (16) argue that it may be helpful to ask the following question: if we are going to measure the concept or determine its existence in the real world, how should this be performed?

The attributes of sustainability, its antecedents and its consequences may be studied in various ways and using a combination of methods. For example, ecological, global, environmental and holistic knowledge among nurses in clinical practice and among staff members at nursing schools, colleges and universities can be measured by

observations or interviews. The motivation to work in a sustainable manner may be explored by surveys combined with focus-group interviews. Environmental work in the healthcare system may be studied by observing the use of energy, waste, water, food, pharmaceuticals and chemicals. The environmental impact on healthcare practices and society may be assessed by measuring the amount of CO<sub>2</sub> emissions.

In the present study, one instrument was found that specifically measures sustainability in practice, in hospitals or in a department, namely, the Green Guide for Health Care (GGHC). The GGHC is an instrument that guides hospitals or separate departments in reorganising for sustainability and that facilitates the measurement of environmental improvements (45).

### *Definition*

Based on the concept analysis in this study, the following definition can be formulated.

The concept of sustainability in nursing can be defined from a core of knowledge in which ecology, global and holistic comprise the foundation. The use of the concept of sustainability includes environmental considerations at all levels. The implementation of sustainability will contribute to a development that maintains an environment that does not harm current and future generation's opportunities for good health.

### **Discussion**

The concept analysis of sustainability has far-reaching implications for nursing and illustrates the current lack of research on the concept. Sustainability is a concept that has yet to be sufficiently studied to provide a knowledge base for nursing. Analysis of the concept can help nurses to design clinical interventions concerning health and environmental issues, in which the concept of sustainability plays a central role.

This analysis may be used to provide a theoretical understanding of the concept of sustainability and to guide both practical and theoretical nursing. With the emergence of health problems related to climate change, the healthcare sector must meet new demands and prepare its organisations and professionals to contribute to sustainable development in the healthcare sector. The present paper provides a workable definition of sustainability, and we hope that this definition will be used in the discussion and development of nursing, thereby facilitating a common platform for nurses and other healthcare professionals in working towards a more sustainable healthcare sector. Because of their professional knowledge regarding the prevention of illness and disease, nurses have a special responsibility to contribute to sustainable

development. This responsibility concerns both current and future generations so that they may live in an environment that does not prevent good health.

Although our concept analysis indicates a focus on the environmental perspective, we believe that providing a much fuller understanding of the concept involves a need to incorporate the three constituent components of the UN definition of sustainable development: environmental, sociopolitical and economic sustainability in the concept of sustainability in nursing.

Sustainability as an academic subject and in the nursing profession requires an awareness of how healthcare activities interact with the environment. Knowledge of environmental issues is important in nursing because the concept of sustainability plays a central role. The global footprint and impact of the healthcare sector on human health and the environment are large and important areas for nursing research. We are well aware that research on health and the environment is broad and encompasses many areas. However, the impact of climate change on the healthcare sector is overall the most central issue and is crucial for future studies of sustainability.

This concept analysis reveals the necessity of environmental and holistic thinking in nursing education, and introduction of an ecocentric approach to nursing may increase awareness of global environmental issues (32). After the UN meeting at Johannesburg in 2002, sustainability and the adoption of healthcare measures promoting sustainable development became crucial issues for the WHO (46).

### *Limitations*

One limitation of this analysis was the lack of research literature available for review in which sustainability was the major topic and in which sustainability was not linked to other concepts. An additional limitation of this concept analysis is that much of what is known regarding sustainability is derived from disciplines outside of nursing, and few nursing studies have focused on sustainability. Finally, the concept analysis method described by Walker and Avant (16) has recently been criticised for its simplification of the original Wilson method of conceptual analysis (47). However, the results are tentative because the analysis of concepts depends on who performs the analysis and because knowledge is constantly developing. Therefore, a result may be credible today but have a different interpretation tomorrow (16).

### **Conclusion**

The outcome of the present analysis provided a definition of sustainability in relation to nursing. Clearly, more research is required to further explore and identify

clearly observable phenomena of sustainability in practical nursing.

To develop a theory of sustainability in relation to nursing, the first step is a systematic analysis of the concept. The conceptual analyses have identified the defining attributes of the concept and its antecedents and consequences. The outcome provided a definition of sustainability in relation to nursing. The meaning of sustainability has been clarified and assumes all of the defining attributes. The intention is that this definition may be used in studies that discuss sustainable development and sustainability in nursing.

A concept analysis is never a finished product. Concepts change with the times we live in, and this phenomenon affects the researcher's use of the concepts. Thus, to limit the use of vague and undefined concepts, it is important to analyse and interpret concepts that are considered to be essential to a subject. It is highly recommended that nursing educators focus on the challenges posed by climate change and its implications for health. Nursing educators should teach students about sustainability and the impact of climate change on the healthcare sector. Early awareness of sustainability and of the various consequences of unsustainable development will prepare new nurses for future challenges.

Nurses working with environmental issues such as the effects of global warming on the healthcare sector may

employ the definition of sustainability and its attributes. We believe that a clear definition is essential for assessment and intervention. However, this area is a topic for further clinical nursing research that may extend across settings and individuals.

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## Author contributions

Anna Anåker is the corresponding author. She has been involved in the design of the study, data collection/analysis and in drafting the text. Marie Elf has contributed with thoughts and ideas in the design, analysis of the study. Both authors contribute to drafting the article and revising it critically for important intellectual content, and both gave final approval of the submitted version.

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