

Effect of Social Media-Based Educational Guidelines on Academic Nursing Students' Performance regarding Sustainability Development

Noha Mohamed Rashed (1), Gehan Awad Shetaway (2), Manal Abd Elsalam Amin (3), Asmaa Mohamed Ahmed Maiz (4)

1Nursing Administration department, Nursing College, Misr University for Science and Technology

2Lecturer of Nursing Administration, Faculty of Nursing, Port Said University

3Fellow of Nursing, PhD in Community Health Nursing, Ain Shams University Hospital

4Assistant Professor of Nursing Administration Department Faculty of Nursing, South Valley University, Egypt

Abstract

Background: A multifaceted idea, sustainability awareness includes information, attitudes, and actions about environmental, social, and economic issues. **So, the current study aimed to** explore the effect of social media-based educational guidelines on academic nursing students' performance regarding sustainability development. **Design:** Quasi-experimental research design one group pre & post-test was utilized. **Setting:** The study was conducted in the Faculty of Nursing, Port Said University in Egypt using an online questionnaire via Google Form and submitting the following link (https://docs.google.com/forms/dle/1FALP_HKsd). **Subjects:** A purposive sample of academic nursing students was obtained from social media such as Facebook and WhatsApp groups who already use social media, and agreed to participate in this study, and all of them took the pre-and post-test. **Tools:** The Sustainability Consciousness Questionnaire (SCQ) was introduced to academic nursing students through interventions by WhatsApp and Facebook groups. SCQ included three parts used to measure academic nursing students' knowledge, attitudes, and behaviors regarding sustainability development. **Results:** After the study group was given social media-based training guidelines, the study's mean score for nursing students' knowledge, attitude, and behavior toward sustainable development increased. A highly significant difference ($p \leq 0.05$) was seen between the pre and post-social media-based educational guidance intervention. **Conclusion:** The study's conclusions support the idea that social media-based instructional guidelines can help nursing students perform better in terms of sustainability development. **Recommendation:** The concept of sustainability development ought to be incorporated into nursing courses, according to the findings. To instill a culture of sustainability development among students, nursing educators should also broaden and update their knowledge on the subject.

Keywords: Academic nursing students, Performance, Social media-based educational guidelines, Sustainability development

Introduction

Climate change has effect on human health; as a result, healthcare facilities need to address this problem and its worldwide implications (WHO, 2021). Climate change is the source of heat waves, hurricanes, storms, floods brought on by rain, and droughts, all of which can have effects on people's health and well-being. Its effects on healthcare providers, systems, and the US economy are likewise extensive. By working to create climate-smart hospitals and health systems, nurses have a significant chance to protect their patients from the effects of climate change (Anåker et al., 2021).

Sustainability is a dynamic state that involves relationships between the social, economic, and ecological systems to prevent natural resource shortages and preserve ecological balance. In addition to other objectives, the healthcare system's stated aim is to fulfill the Sustainable Development aims to "ensuring healthy lives and promoting well-being for every person of all ages" (UN, 2020).

In nursing, sustainability is theoretically linked to the long-term objective of maintaining a secure environment for present and future generations. Based on the moral imperative to execute a health-in-all-policies strategy (i.e., "first do not harm"), the healthcare sector urgently needs to become more ecologically

responsible and sustainable (Anåker and Elf, 2021). Healthcare delivery affects the environment and plays a role in climate change. As a result, information about the environmental effects of nurses' use in clinical practice should be included in nursing education. It is imperative to incorporate sustainability concerns into nursing courses in a way that makes them more applicable to clinical practice and "closer to home" (Richardson et al., 2019).

According to Olsson et al. (2019), sustainable development is defined by the Commission on Sustainable Development (CSD) as development that meets present-day global needs without compromising future expectations (Holden & Banister, 2017 UNESCO, 2020).

Sustainable development encompasses three key dimensions: economy, environment, and society. The socio-cultural dimension of sustainable development encompasses human rights, gender equity, peace and human security, cultural variety, and intercultural understanding. Also, Social services, the right to health and education, and social justice are other issues that should be addressed (Atmaca & Pehlivan, 2018). Sustainable urbanization and the preservation of natural resources (water, air, soil, energy, agriculture, and biodiversity) are among the problems associated with environmental sustainability (UNESCO, 2021).

Environmental sustainability includes the decrease of pollution in the environment and the utilization of renewable energy sources (wind, geothermal, etc.) as opposed to non-renewable energy sources (coal, fuel, etc.). In addition, minimizing the ecological imprint, protecting forests and expanding green space, decreasing resource consumption and contamination of the environment through trash recycling, and halting global warming (Atmaca, et al., 2018). However, conservative resource use, income and expense balance, eliminating income distribution inequality, sustainable production and cost, dependable investment environments, investments in high-income sectors, investments in vital sectors, and research and development are some of the issues associated with economic sustainability (Olsson et al., 2019).

As change agents, nursing students may be equipped to question current practices and bring about improvements. Critical thinking and change agency must be emphasized in nursing

education, as is reasonable to expect from institutions of higher learning. Student nurses must also be aware of the subject-to-question practice on matters of sustainability and climate change (Felicilda et al., 2018). Álvarez-Nieto et al. (2018) have devised an educational intervention that stresses the importance of sustainability and climate change to nursing students, drawing on a research program as its foundation.

One of the most important instruments for increasing public knowledge of environmental challenges is a framework that considers environmental difficulties alongside economic, social, political, and ethical issues in education for sustainable development, or ESD. Several disciplines and institutions should be in charge of spreading knowledge about sustainable development and its various aspects (Tekbiyik & Celik, 2019). Education for Sustainable Development is exposing the domains in which postsecondary education is trying to develop graduates' sustainability competencies. Education that encourages changes in knowledge, skills, values, and attitudes to enable a more equitable and sustainable society for all is known as education for sustainable development or ESD. By taking a balanced and integrated approach to the economic, social, and environmental aspects of sustainable development, ESD seeks to empower and equip present and future generations to satisfy their requirements (Leicht, & Byun. 2018).

A multifaceted notion, sustainability awareness includes actions, attitudes, and knowledge about environmental, social, and economic issues to accomplish the shift to a sustainable future. Education for sustainable development fosters several competencies, including critical thinking, envisioning future situations, and collaborative decision-making (Olsson, et al., 2019).

According to Biasutti and Frate (2019), education for sustainability development tools focuses on three dimensions: knowledge, behavior, and attitude. Knowledge is the comprehension of a subject as well as the breadth of one's information or comprehension; behavior is an individual's conduct and includes an organism's reaction to stimuli as well as an individual, group, or human's reaction to their

environment; A cognitive position, feelings, or emotions toward a fact or state are referred to as attitudes; a mental position, feelings, or emotions toward a truth or circumstance are referred to as attitudes (**Online Dictionary, 2020**).

Social media, whose definition is expanding and always changing, is used by billions of people worldwide. The term typically refers to Internet-based tools that enable people and societies to share information, ideas, images, and other content; on a professional level, healthcare providers use social media to advance professionalism, raise individual awareness, provoke patients, argue health care rules and practice issues, encourage healthy behaviors, and disseminate health information to the community (Dictionary O. Social media: Oxford Dictionary, **2019**).

Over 3.2 billion people are active users of social media worldwide, and this figure is steadily growing. Social media's function differs depending on users and non-users, age ranges, and demographic groups. Social media's function is evolving regularly since technological change is connected to language and cultural shift patterns. Social media is increasingly used in the healthcare industry to speed up communication, spread correct information, and spread awareness about support, therapies, and self-care alternatives (**Cherak et al., 2020**).

Significance of the Study

In higher education, sustainability has not traditionally been a theme of discussion for nurses. As a result, there has been little focus on the awareness and skills that nurses will need to address global sustainability concerns. Furthermore, a wealth of international research on the more general subject of Higher Education for Sustainable Development ESD offers some significant new insights (**Aronsson et al., 2020**). It has placed particular emphasis on helping nurses acquire the fundamental sustainability skill of systems thinking and recognize the linkages between their professional objective of promoting healthy living and the worldwide challenge of climate change (**Richardson et al., 2019**). Social media is increasingly used in the

healthcare industry to speed up communication, spread correct information, and spread awareness about support, therapies, and self-care alternatives (**Cherak et al., 2020**). So, the the research was to determine the impact of social media-based educational guidelines on academic nursing students' knowledge, attitudes, and behavior regarding sustainability development.

Aim of the study:

The study aims to explore the effect of social media-based educational guidelines on academic nursing students' performance regarding sustainability development through the following objectives:

- 1- Assess academic nursing students' knowledge regarding sustainability development
- 2- Assess academic nursing students' attitudes regarding sustainability development
- 3- Assess academic nursing students' behavior regarding sustainability development
- 4- Design social media-based educational guidelines based on the needs of academic nursing students.
- 5- Implement social media-based educational guidelines based on the needs of academic nursing students
- 6- Evaluate the effect of social media-based educational guidelines on academic nursing students' knowledge, attitudes, and behavior regarding sustainability development.

Research hypothesis:

Social media-based educational guidelines will improve academic nursing students' performance regarding sustainability development

Operational Definition:

Performance: included knowledge, attitudes, and behavior of the academic nursing students

Sustainability development: is first defined operationally as the nurses' students' knowledge, as determined by a knowledge questionnaire, about their sustainability development score. Second, the attitude of the nurses concerning their sustainable development score is determined by the attitude questionnaire. Third,

the behavior of the nurses' students was determined by a behavior questionnaire concerning their sustainability development score. The creators of such surveys were (Gericke et al., 2018).

Subjects and Method:

Design:

Quasi-experimental research design one group pre & post-test was utilized.

Setting:

The study was conducted in the Faculty of Nursing, **Port Said** University in Egypt using an online questionnaire via Google Forms and submitting the following link (<https://docs.google.com/forms/dle/1FALP HKsd>)

Subjects:

A purposive sample of 500 academic nursing students was obtained from social media such as Facebook and WhatsApp groups who already use social media and agreed to participate in this study, and all of them took the pre-and post-test. These academic nursing students completed an online Google Form that was opened on 10 and 25 January 2023 for about fifty days after the link was closed. Both genders were drawn from academic nursing students in the second, third, and fourth levels, they were the studied sample.

Tool for data collection:

Tool: The Sustainability Consciousness Questionnaire (SCQ) developed by Gericke et al., (2018), in an English language that was introduced to academic nursing students through the interventions by Whats App and Facebook groups. SCQ was used to measure academic nursing students' knowledge, attitudes, and behaviors regarding sustainability development.

The three components of SD (environmental, social, and economic) were then linked to these three psychological constructs in the SCQ instrument. The SCQ, or Sustainability Consciousness Questionnaire, was divided into four parts:

1. The sample participants' demographic characteristics

Second, the Sustainability Knowledge Questionnaire (SNQ)

3. The SAQ or Sustainability Attitudes Questionnaire

4. Questionnaire on Sustainability Behavior (SBQ)

Information on gender, academic year, exposure to sustainability development, and information source was covered in the first section of the survey. The Sustainability Knowledge Questionnaire (SNQ), which is used in the second section, assesses nursing students' understanding of sustainability development. There were 19 items total, divided into three categories: environmental (6 items), social (8 items), and economic (5 items).

Scoring system:

- Nineteen knowledge evaluation items, each worth five points Likert scale with 1 being severely disagree, 2 being disagree, 3 being neutral, 4 being agree, and 5 being highly agree. A total score ranging from 19 to 95 was assigned based on the students' knowledge of sustainability development (SD). Each student's overall score was divided into the following categories:
- When an individual receives less than 50% of the overall score, or less than 48 points, it indicates poor knowledge. Fair knowledge is defined as achieving 50% to less than 75% of the overall score (48 to 71 points), while good knowledge is defined as achieving 75% or more of the total score (71 to 95 points).

The Sustainability Attitudes Questionnaire (SAQ), which is the third section, gauges nursing students' perspectives on sustainability development. Four things were related to the environment, six to society, and four to economy, making up the total of 14 items with three dimensions.

Scoring system:

The 14 attitude assessment items, each with five points on a Likert scale of 1 to 5, were used to evaluate the attitudes of nursing students. (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly agree. The student received a total score between 14 and 70 based

on their attitude toward sustainable development (SD). Each student's overall score was divided into three categories: "Good attitude," when it was between 35 and 53 points, "Neutral attitude," when it was between 53 and 75 percent of the entire score, and "Poor attitude." when the score (53–70 points) was at least 75% completed.

In the fourth component, nursing students' behavior toward sustainability development are assessed using the Sustainability Behavior Questionnaire (SBQ). Seven things from the environmental category, six from the social category, and four from the economic category were among the seventeen items with three dimensions.

Scoring system:

Each of the 17 behavior assessment items for nursing students carried a five-point Likert scale (1–5): (1) for strongly disagree, (2) for disagree, (3) for neutral, (4) for agree, and (5) for strongly agree. The evaluation of the students' behavior regarding sustainability development (SD) resulted in a total score ranging from 17 to 85. The overall rating of every student was divided into three categories: "Excellent behavior" when the score was less than 50% (less than 43 points), "Neutral behavior" when the score was between 50% and 75% (between 43 and 64 points), and "Excellent behavior" when the score was more than 75% (between 64 and 85 points).

Field of work

The Nursing College Dean's official approval was acquired. The study's objectives, design, timing, possible benefits, and methods of data collection were all explained to the respondents to secure their informed written consent and safeguard their rights. Data was handled with extreme confidentiality, and the respondents were assured. Additionally, as the respondents were not compelled to provide their identity, their anonymity was preserved.

Tools validity and reliability:

- The study tools were tested for their content validity by a panel of five experts in the field of

the study in the field of administration nursing to test the content validity. No modifications of the tool were done according to the panel judgment on clarity of sentences, appropriateness of content, and sequence of items and translated into simple Arabic language before using it.

The alpha Coefficient Test (Cronbach alpha) is used to measure reliability. A Cronbach alpha of ($\alpha = 0.87$) indicates the internal consistency of the first instrument (the knowledge questionnaire), ($\alpha = 0.79$) indicates the internal consistency of the second instrument (the attitude questionnaire), and ($\alpha = 0.78$) indicates the internal consistency of the third instrument (the behavior questionnaire).

Pilot study:

A pilot research including 50 nursing students, or 10% of the study population, was conducted to assess the feasibility of the study instruments and gauge their clarity, applicability, and time required to complete them all. Nothing was changed. The actual study included the pilot study sample.

Administrative design:

Data collection from the study settings required written consent from the faculty of nursing dean at **Port Said** University. The following are some of the results of the study that were carried out with consideration for participant rights and ethical standards of research.

Ethical consideration:

The researchers obtained approved oral consent from each nursing student for her participation after explaining the aim of the study and securing the confidentiality of the data. The studied total nursing students were able to withdraw or refuse at any time from the study without any responsibilities.

Data Collection Procedure

Assessment, planning, implementation, and evaluation were the four phases of an educational intervention on sustainable development.

I: Assessment phase:

Through the use of a sustainability consciousness scale, this stage attempted to evaluate nursing students' knowledge, attitudes, and behaviors related to sustainability development both before and after social media-based educational guidelines for learners of nursing.

II: Planning phase:

Improving nursing students' knowledge, attitudes, and behaviors toward sustainability development was the goal of an educational intervention on the topic. The use of the sustainability development Social Media-Based Educational Guidelines was based on the results of the knowledge, attitude, and behavior surveys administered to nursing students, as well as their degree of agreement before the intervention.

The sustainability development intervention included the following topics:

- Climate change concept.
- Climate change's impact.
- The idea of sustainable growth and sustainability.
- How climate change and sustainability are related.
- Development Objectives for Sustainability.
- Nursing students' challenges with sustainability
- Climate change and the function of nursing.
- Nursing's contribution to sustainable development.
- The fundamental knowledge of sustainability development, which includes the environmental, social, and economic facets.
- Positive attitude toward Sustainability sustainable development, which includes the environmental, social, and economic facets.
- Good behavior about the development of sustainability, encompassing the environmental, social, and economic spheres.
- The state of sustainability and health

III: implementation phase:

They took the pre-and post-test together. These academic nursing students filled out an online Google Form that was accessible between October 10 and 25, 2023 and remained active for almost fifty days after the link was removed. The second-, third--- ---, and fourth-

level academic nursing students of both genders were represented. Nursing students were notified via email, other online communication channels, clinical what's up groups, Facebook groups, and other forms of communication to complete an electronic version of the Sustainability Consciousness Questionnaire (SCQ) using the Google application website. The researchers assured the nursing students that all information collected would be used only for research. Every participant in the study had the choice to take part in the study voluntarily.

A study questionnaire was given to students twice: once before the intervention and again a month following it, to assess the efficacy of the Social Media-Based Educational Guidelines. To gather data, which included an online questionnaire, they sent the participating nursing students a link. Groups on Whats App and Facebook were presenting this link. The moms were notified about the study's history, goals, and anticipated results on the first page of the questionnaire. Before the implementation of social media-based instructional standards, all nursing students under study received the following link:
<https://docs.google.com/forms/d/e/1FALPHKs.d>
 Based on evaluation results, the researchers created social media-based teaching guidelines for sustainable development.

Using digital learning tools like Microsoft Teams and Zoom meetings, the sustainable development intervention was put into practice. There were 400 nursing students in all.

It was split into eight sessions, each lasting two hours, for a total theoretical duration of eight hours. Each group received an 8-session sustainable development intervention, with two of those sessions having poor conduct. The online lectures and interventions about sustainability development were not well appreciated by the nursing students. Electronic posters and brochures, PowerPoint, and videos were used as teaching aids.

Eight sessions covering the following educational intervention content were given to each group:

In the first session, we greeted the nursing students, gave them a soft copy handout, and then had them fill out an electronic pretest sheet with sustainability questionnaires and see how the intervention objectives applied to the study sample.

In the second session, teach nursing students about the idea and effects of climate change from a theoretical and practical standpoint. You will also facilitate a group discussion on the subject.

During the third session, lectures and films will be used to present theoretical and practical knowledge on the concepts of sustainability, sustainable development, and the relationship between climate change and sustainability.

In the fourth session, learn about the theoretical and practical aspects of overcoming sustainability barriers among nursing students and see examples of scenario-based situations based on the Sustainable Development Goals.

In the fifth session, learn about the theoretical and practical aspects of the nursing role of climate change and sustainability development, as well as see a health scenario about sustainability.

The six **sessions** cover environmental, social, and economic sustainability development from a theoretical and practical perspective. They also include case studies of sustainable environmental, social, and economic initiatives.

The seven sessions include the following topics: conducting brainstorming sessions to address sustainability-related challenges; and providing theoretical and practical knowledge on developing a positive attitude toward sustainability development involving dimensions, namely: environmental, social, and economic.

The eight sessions provide theoretical and applied knowledge about constructive conduct toward sustainable development, which encompasses the environmental, social, and economic spheres.

IV: Evaluation phase:

After distributing the booklet, videos, PowerPoint presentation, and posters (post-test) to the participants one month earlier, the questionnaire was re-posted to them on the Google Form for collection utilizing the same pre-test resources (tool I (part 2, 3, 4).

Statistical analysis

Version 22 of the SPSS (statistics Package for Social Science) statistics package was used to enter and analyze data. Graphics were created with the Excel software. The standard deviation (SD) and mean (X) were used to display quantitative data. The paired sample T-test was employed for the analysis to compare the two means, and a significance level of $p \leq 0.05$ was established for the P value. Numbers, percentages, and frequency distribution tables were used to display the qualitative data. A chi-square analysis was performed (χ^2) test. The level of significance was set as a P value at $p \leq 0.05$.

Results:

Table 1 shows that, of the students under study, 48% were in their second academic year, 32% were in their third, and 20% were in their fourth. The majority of the students were female, and 54% and 66% of them were living in rural areas.

Figure 1 illustrates that, before the intervention, just 8% of nursing students in academic programs were aware of sustainability developments.

Figure 2 demonstrates that media and the internet are the main sources of information for 85% of the studied academic nursing students.

Table (2) confirms that the mean score for the knowledge dimensions (social (34.7), environmental (26.4), and economics (22.8) have improved among the studied academic nursing students post social media-based educational guidelines with a highly significant improvement ($P < 0.0001$).

Figure 3: Presents that 86% of the studied academic nursing students had poor knowledge levels regarding sustainability development pre-social media-based

educational guidelines while all of them (100%) had good knowledge post-social media-based educational guidelines with significant improvement at $P < 0.001$.

Table (3) revealed that the mean scores for the categories of attitude (social (22.9), environmental (18.3), and economics (15.9) have improved among the studied academic nursing students post social media-based educational guidelines with a highly significant improvement at ($P < 0.001$).

The study of academic nursing students' total attitudes concerning sustainability development before and after the social media-based educational guidelines are compared in **Figure 3**. As can be seen from the table, there was a significant improvement between the total attitude before and after social media-based educational guidelines, with no one of the study participants having a good attitude towards sustainability development before the social

media-based educational guidelines compared to 95% of the studied academic nursing students post the social media-based educational guidelines.

Table (4) portrays that the mean score concerning behavior dimensions (environmental (31.2), social (27.2), and economics (20.4) have improved among the studied academic nursing students post social media-based educational guidelines with a highly significant improvement at ($P < 0.001$).

Figure 4. Reveals that there was a significant improvement between the total behavior pre and post-social media-based educational guidelines, with 90% of study participants having poor behavior towards sustainability development in the social media-based educational guidelines compared to 98% of the studied academic nursing students post-the social media-based educational guidelines.

Table 1: Academic nursing students' distribution regarding their demographic data (N=500).

Variables	Study group	
	N0.	%
Academic year):		
2 nd year	240	48
3 rd year	160	32
4 th year	100	20
Gender:		
Male	230	46.0
Female	270	54.0
Residence		
Urban	170	34.0
Rural	330	66.0

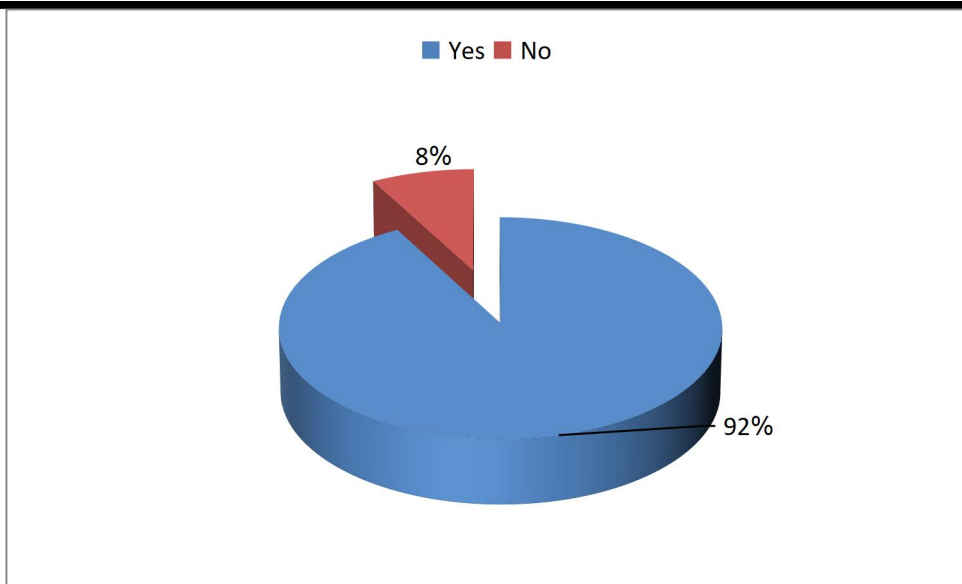


Figure 1: The academic nursing students' distribution regarding their hearing about Sustainability development (N=500).

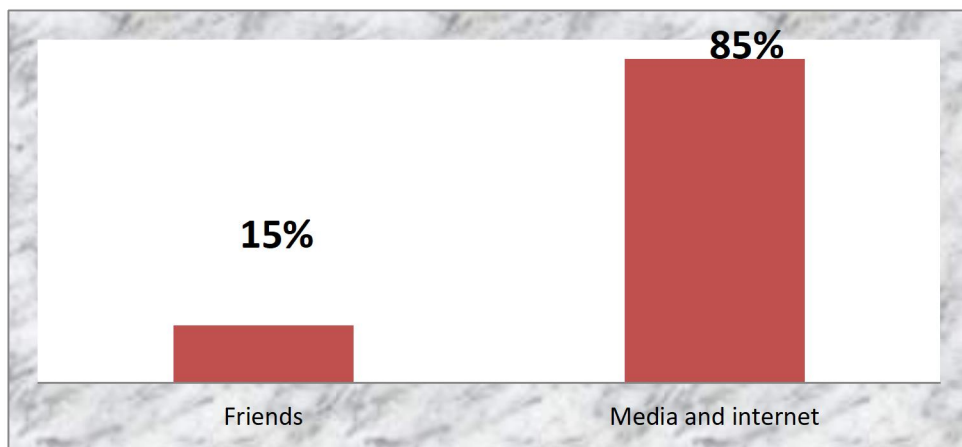


Figure 2: The academic nursing student's distribution regarding their Source of information about Sustainability development (N=500).

Table 2: Difference in mean scores in three knowledge dimensions regarding sustainability development of the studied academic nursing students pre and post-social media-based educational guidelines (N=500)

Knowledge dimensions	Pre		Post		P- value
	Mean	±SD	Mean	±SD	
Environmental	8.5	1.6	26.4	4.4	t (paired)= 102.2 P<0.001
Social	17.9	3.7	34.7	1.3	t(paired)= 207,4 P<0.001
Economic	9.4	3.6	22.8	1.2	t(paired)=204,3 P<0.001
Total knowledge	35.8	8.7	83.9	5.9	t(paired)= 233,6 P<0.001

** Highly Statistical significant ($P \leq 0.001$)

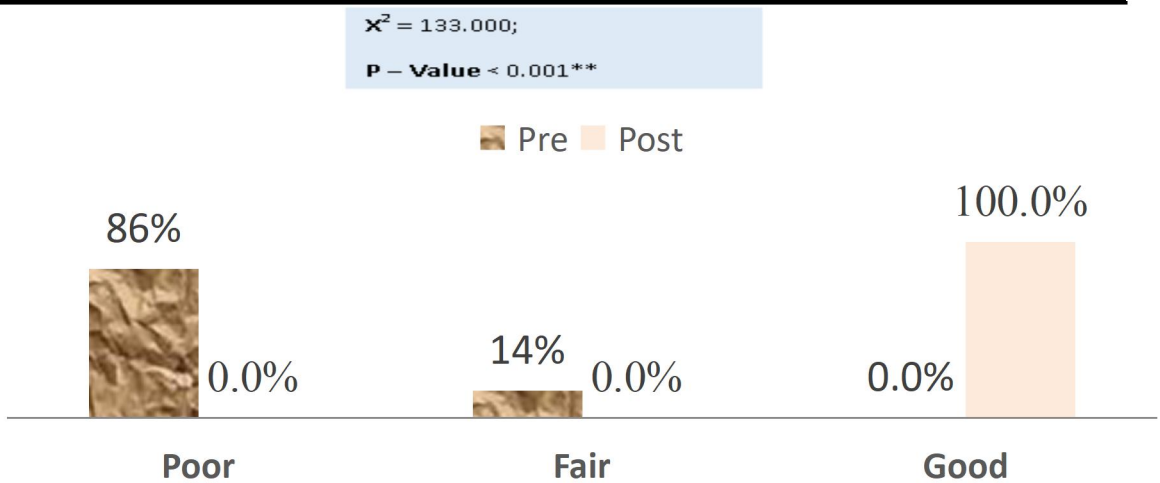


Figure (3): Total knowledge level regarding sustainability development of the studied academic nursing students pre and post-social media-based educational guidelines (n= 500).

Table 3: Difference in mean scores in three attitude dimensions regarding sustainability development of the studied academic nursing students pre, and post-social media-based educational guidelines (N=500)

Knowledge dimensions	Pre		Post		P- value
	Mean	±SD	Mean	±SD	
Environmental	4.6	2.9	18.3	1.6	t (paired)= 105.2 P<0.001
Social	6.5	2.5	22.9	2.8	t(paired)= 208,4 P<0.001
Economic	8.8	1.2	15.9	2.5	t(paired)=207,3 P<0.001
Total knowledge	19.9	4.9	57.9	6.9	t(paired)= 245,6 P<0.001

** Highly Statistical significant (P ≤ 0.001)

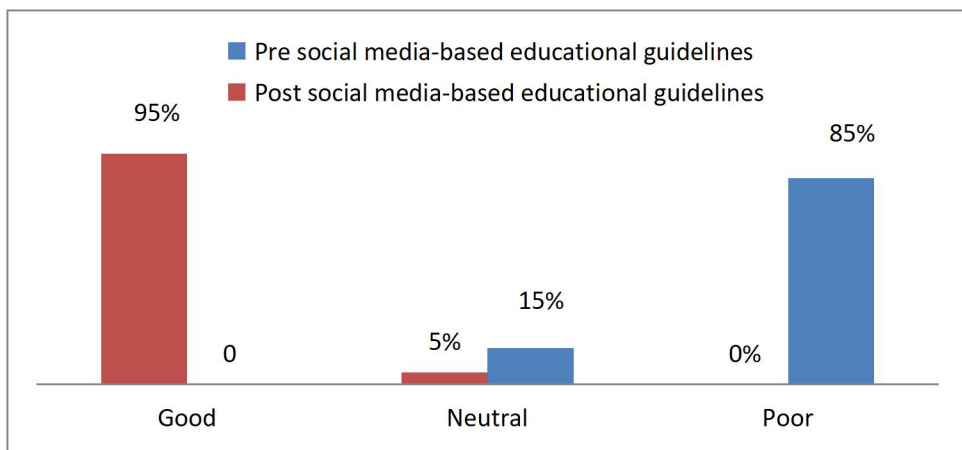


Figure (3): Total attitude level regarding sustainability development of the studied academic nursing students pre and post-social media-based educational guidelines (n= 500).

Table 4: Difference in mean scores in three behavior dimensions regarding sustainability development of the studied academic nursing students pre and post-social media-based educational guidelines (N=500)

Knowledge dimensions	Pre		Post		P- value
	Mean	±SD	Mean	±SD	
Environmental	9.2	2.2	31.2	1.2	t (paired)= 107.6 P<0.001
Social	8.3	1.3	27.2	1.2	t(paired)= 208,5 P<0.001
Economic	7.2	2.3	20.4	5.1	t(paired)=203,7 P<0.001
Total knowledge	24.7	5.8	78.9	7.5	t(paired)= 239,3 P<0.001

** Highly Statistical significant ($P \leq 0.001$)

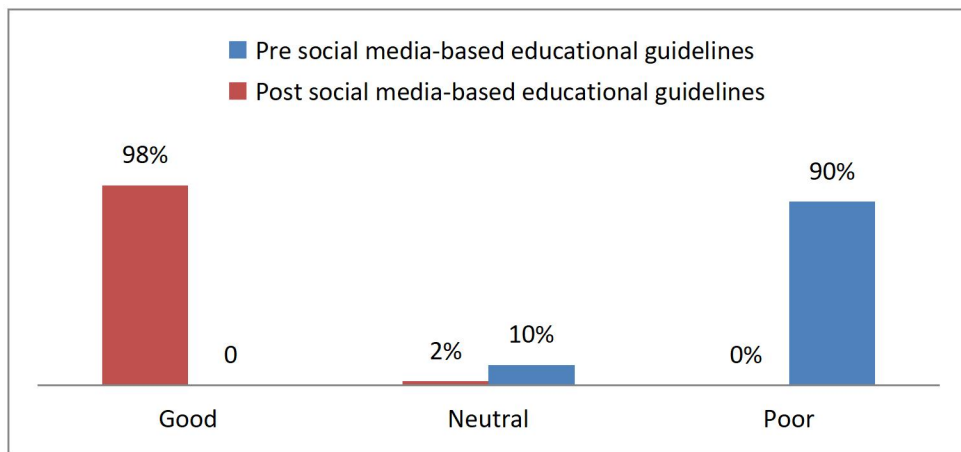


Figure (4): Total behavior level regarding sustainability development of the studied academic nursing students pre and post-social media-based educational guidelines (n= 500).

Discussion:

In minimizing the effects of climate change on the healthcare industry and adapting to it, nurses play a crucial role. It is imperative to evaluate students' perspectives on climate change and sustainability since they will be entering a new professional role in the field of sustainability development (Anåker et al., 2021). Higher education is therefore highly sought after globally to equip students to handle the serious environmental, social, and economic ramifications of climate change and sustainability (Shaw et al., 2021).

According to the findings, most of the students were female, and less than half were in their second academic year. The college's reputation for having only recently admitted male students may help to explain it.

The low proportion of academic nursing students who are aware of the Sustainability development pre-intervention was indicated by the results. Regarding the adoption of social media-based instructional guidelines, it validated the investigated sample's actual needs, according to the researchers.

The results revealed that media and the internet are the main sources of information among the majority of the studied academic nursing students. The internet is the most popular tool for communication, knowledge acquisition, and search, making it the language of the modern era.

The findings showed that the majority of the academic nursing students under study got their information mostly from the media and the Internet. As the most popular means of

communication, information sharing, and search, the internet is the language of the modern world.

The study's findings showed that academic nursing student' mean scores in the knowledge domains of the environment, society, and economy had significantly improved following the implementation of social media-based instructional guidelines. This finding may be explained, in part, by the notion that nursing students are still learning about the idea of sustainable development, which is well-known worldwide. Furthermore, no information on this topic was included in their nursing curriculum. Furthermore, the vast majority of them stated that they were unaware of sustainability and that There was not enough time to attend a training course or workshop on sustainable development.

Anåker et al. (2021) provide support for the study outcomes. This study set out to determine how nursing students felt about sustainability. The study found that applying sustainability was difficult and concluded that, in the opinion of nursing students, further instruction is required. It demonstrated, in the opinion of the researchers, the advantages of implementing social media-based instructional principles.

As a result of the social media-based educational guidelines, the majority of the nursing students who were the subject of the study had low levels of sustainability development knowledge before these guidelines, but all of them had good knowledge with notable improvements thereafter. According to multiple studies, nurses lack the information required to support and engage in sustainability development methods. The study's findings are consistent with these findings (**Anåker et al., 2021; Tiitta et al., 2021**). In a similar vein, **Aronsson et al. (2020)** contended that undergraduate instruction emphasizing the sustainability and importance of climate change for health and healthcare can help nurses overcome difficult, unsustainable clinical practices. On the other hand, it is stated that education is crucial to accomplishing sustainable development objectives (**Otto et al., 2020; Shaw et al., 2021**). Thus, the primary goal of nursing education must be to teach aspiring nurses how to deliver sustainable healthcare.

The study's findings showed that academic nursing students' mean scores on the environmental, social, and economic knowledge components had significantly improved after following social media-based instructional guidelines. One explanation for this outcome, which is well-known worldwide, maybe the presumption that nursing students are still learning about the concept of sustainable development. Furthermore, there was no information on this topic in their nursing curriculum. In a similar vein, most of them stated that they had not heard of sustainability, which could have been brought on by the stress and workload associated with the nursing study. As a result, there was no time to attend any training sessions or workshops on sustainable development. According to **Michel and Zwickle's research (2021)**, training courses improved students' understanding of sustainability. These results are consistent with their findings.

Zhang et al. (2022) also discovered a favorable relationship between knowledge and the degree of practical application. It demonstrated, in the opinion of the researchers, the advantages of implementing social media-based instructional principles. This is consistent with research by **Wiafe et al. (2020)**, which found that students' use of social networks improves their relationships and boosts their exchange of knowledge, information, and communication.

The findings showed that, before social media-based educational guidelines, the majority of nursing students under study had low knowledge levels about sustainability development, but that, following the implementation of these guidelines, all of them had good knowledge with notable improvements. The study's findings are in line with other research that has discovered nurses don't have the skills needed to support and take part in initiatives for sustainable development (**Tiitta et al., 2021**). Additionally, **Olsson et al. (2022)** found that following the intervention, students' knowledge of sustainability increased. Additionally, **Esringü & Süleyman (2020)** noted that following training, university students had great awareness and strong knowledge.

In a similar vein, **Aronsson et al. (2020)** contended that undergraduate instruction emphasizing the sustainability and importance of climate change for health and healthcare can help nurses overcome difficult, unsustainable clinical practice. Conversely, it is claimed that education is crucial to reaching sustainable development objectives (**Otto et al., 2020; Shaw et al., 2021**). Nursing education must therefore concentrate on teaching aspiring nurses how to deliver sustainable healthcare. In addition, the research conducted by **Breakey et al. (2023)** demonstrated that a considerable segment of pupils demonstrated inadequate comprehension of climate change, underscoring the importance of instructing upcoming health professionals on the relationship between climate change and health. The importance of interventions and educational initiatives in addressing these critical issues.

The mean score for the three attitude dimensions—environmental, social, and economic—among the academic nursing students under study showed a highly significant improvement following the implementation of social media-based instructional guidelines. Simultaneously, there was a notable improvement in the overall attitude before and after social media-based educational guidelines. Before the implementation of these guidelines, none of the study participants had a positive attitude toward sustainability development, whereas nearly all of the nursing students under investigation did so afterward.

The results indicate that nursing students may have poor knowledge about sustainability, which could explain the interpretation of these data. Because it is unclear to them, the nursing students were not familiar with the fundamental ideas of sustainable development. They were ill-prepared to manage climate change and implement the objectives of sustainable development, failing to understand their roles and responsibilities about sustainability and acting accordingly. These results are consistent with a study by **Nousheen et al. (2020)**, which showed that after an intervention, student-teacher attitudes toward sustainable development (SD) significantly improved.

The study by **Cruz et al. (2018)** also supports the findings of this investigation. In

that study, the attitudes of Saudi Arabian nursing students toward sustainability and the environment in healthcare were evaluated in several different aspects. According to the study, attending training and seminars on environmental issues, being conscious of climate change, and learning about environmental topics in nursing school all strongly influence nursing students' attitudes.

The educational intervention, as per the literature, is formulated to emphasize the significance of sustainability in nursing and is grounded in a previous study program (**Alvarez-Nieto et al., 2018**). A sustainability development education intervention was created, and the results demonstrated how effective it was on the knowledge, attitude, and conduct of the nursing students who took part. The three dimensions of knowledge, attitude, and behavior (environmental, social, and economics) within the study group showed a very significant improvement in all different items after the intervention.

The study's findings showed that academic nursing students' mean scores on the environmental, social, and economic behavior components had significantly improved after following social media-based instructional recommendations. According to the researchers, it validated the efficacy of using social media-based instructional standards. Taking into account the changes in technology and the generational makeup of today's college students, students are used to using the internet and social media to obtain information instantly (**Kremer, 2022**). One of the most important components of a good undergraduate education is getting students involved in their learning using social media (**Borup et al., 2020**).

The findings of this study support the study's hypothesis, which was, "There will be a difference regarding knowledge, attitude, and behavior of sustainability development post-intervention." Numerous explanations could account for these results. One of these justifications is that through creating an educational intervention regarding sustainability development, nursing students were made aware of this idea and related materials. Students also learned about the role that nursing plays in sustainability and the objectives of sustainability

development. The significance of application sustainability in healthcare was also determined by the educational intervention that inspires nursing students to put sustainability development into practice.

For a second reason, this educational intervention gave nursing students the knowledge and skills they needed to promote and take part in sustainable development. Furthermore, there were a variety of circumstances and issues in the content education intervention that called for sustainable solutions. Their ability to think critically and solve problems is thereby enhanced by these. In light of the study's findings, their conduct and attitude have therefore significantly improved. When it came to sustainability and their involvement in it, the control group of students who did not receive any educational interventions showed very little change. Their behavior was not sustainable since they lacked the essential understanding.

These findings, which were corroborated by **Grandisoli & Jacobi's (2020)** study, showed that, in comparison to a control group, the participating students had significant changes in both knowledge and habits. Moreover, **Badea et al. (2020)** demonstrated how sustainable development enhanced the practices of the subjects. There is a dearth of research in Egypt on creating educational interventions for sustainable development for nursing students. Simultaneously, it is found in a few international investigations. **Cruz et al. (2018)** conducted one of these investigations. This study underlined the need to include environmental issues and concerns, as well as sustainability in healthcare, in the nursing curriculum and provide opportunities for students to engage in extracurricular activities linked to the environment, like seminars and workshops.

Additionally, a study conducted by **Richardson et al. (2017)** supports the findings of the study. Research indicates that implementing a scenario-based learning approach can impact the attitudes and comprehension of nursing and midwifery students about sustainability and climate change. This technique produces a distinctive and

engaging approach that is educational and therapeutically applicable when applied to clinical skills. To contribute to sustainable healthcare and society in a world facing climate change, nursing students must be ready to act. The opinions and experiences of students are essential to the ongoing improvement of education (**Sperstad et al., 2020**). Likewise, **Aronsson et al. (2020)** emphasized that change management and sustainable development can be implemented by nurses with the support of sustainability training.

Conclusion:

From the findings of the present study, it can be concluded that Based on the study findings, the social media-based educational guidelines were effective in improving the nursing students' performance toward sustainability development.

Recommendation:

Based on the current study findings, it can be recommended that:

- Based on the findings, the concept of Sustainability development should be included in nursing curricula.
- Enrich and update the awareness of nursing educators about sustainability development to spread sustainability development culture among students.
- Replication of the study regarding sustainability development to generalize results and be more spread for large numbers of nursing students as well as nurses.

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