

ENHANCING SUSTAINABILITY DEVELOPMENT IN NURSING EDUCATION STUDENTS: THE ROLE OF SOCIAL MEDIA-BASED EDUCATIONAL GUIDELINES

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Abstract

Background: Sustainability awareness is a multifaceted concept embracing knowledge, beliefs, and behaviors pertaining to environmental, social, and economic dimensions. It involves understanding principles like reducing ecological footprints, promoting equity, and ensuring long-term economic viability. **So, the current study aimed to** determine the role of social media-based educational guidelines on enhancing sustainability development in nursing education students. **Design:** To complete this study a quasi-experimental research design one group pre & post-test was used. **Setting:** The study was applied in the Faculty of Nursing, Sohag University in Egypt using an online questionnaire via Google Form and submitting the following link (<https://docs.google.com/forms/dle/1FHLP HKsd>). **Subjects:** A convenience sample of all 600 nursing students were enrolled in the fourth academic year and 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. **Tool:** The Sustainability Consciousness Questionnaire (SCQ) was introduced to nursing students through interventions by Whats App and Facebook groups. **Results:** After the study group was given social media-based educational 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 guidelines. **Conclusion:** The study's concluded

that The social media-based educational guidelines has a positive effects on enhancing sustainability development among nursing students. **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: Nursing students, Social media-based educational guidelines, Sustainability development

INTRODUCTION

Climate change impacts human health; consequently, healthcare institutions must tackle this issue and its global ramifications (WHO, 2024). Climate change causes heat waves, hurricanes, storms, rain-induced floods, and droughts, all of which can impact individuals' health and well-being. Its impact on healthcare providers, systems, and the US economy is also significant. Through efforts to develop climate-smart hospitals and health systems, nurses have a vital opportunity to safeguard their patients from the impacts of climate change (Anåker et al., 2021). Sustainability is an evolving condition that encompasses interactions among social, economic, and ecological systems to avert resource depletion and maintain ecological equilibrium. Alongside various goals, the healthcare system's declared purpose is to achieve the Sustainable Development goals of "ensuring healthy lives and promoting well-being for everyone at all ages (UN, 2020).

In nursing, sustainability is intrinsically linked to the primary aim of maintaining a secure environment for both present and future generations. Grounded in the ethical obligation to implement a health-in-all-policies approach (i.e., "first do no harm"), the healthcare industry must promptly adopt greater ecological responsibility and sustainability (Anåker and Elf, 2021). Healthcare provision impacts the environment and contributes to climate change. Consequently, details regarding the environmental impact of nurses' utilization in clinical practice ought to be incorporated into nursing education. Incorporating sustainability issues into nursing courses is essential for making them more relevant to clinical practice and "nearer to home" (Richardson et al., 2022). As per Olsson et al. (2019), the Commission on Sustainable Development (CSD) defines sustainable development as progress that satisfies current global requirements without jeopardizing future aspirations (Holden& Banister, 2020 , UNESCO, 2024).

Three key facets of sustainable development are the economy, environment, and society. The socio-cultural component of sustainable development include intercultural understanding, gender equality, human rights, peace and security, and cultural variety. Other issues that require attention include social fairness, social services, and access to healthcare and education

(Atmaca & Pehlivan, 2021). Sustainable urban development and the conservation of natural resources (water, air, soil, energy, agriculture, and biodiversity) are key challenges linked to environmental sustainability (UNESCO, 2024).

Environmental sustainability involves reducing pollution in the environment and using renewable energy sources (wind, geothermal, etc.) instead of non-renewable energy sources (coal, fuel, etc.). Furthermore, reducing the ecological footprint, safeguarding forests and increasing green areas, lowering resource usage and environmental pollution via waste recycling, and preventing global warming (Atmaca, et al., 2021).

Nonetheless, issues related to economic sustainability include careful resource utilization, balancing income and expenses, addressing income distribution disparities, sustainable production and costs, reliable investment climates, investments in high-revenue sectors, funding critical sectors, and research and development (Olsson et al., 2022). As change agents, nursing students might be prepared to challenge existing practices and drive enhancements. Emphasis on critical thinking and change agency is essential in nursing education, as it is reasonable to expect from higher education institutions. Nursing students should also be conscious of the critical discussion surrounding issues of sustainability and climate change (Felicilda et al., 2021). Álvarez-Nieto et al. (2021) created an educational program that emphasizes the significance of sustainability and climate change for nursing students, based on a research initiative

A crucial tool for enhancing public awareness of environmental issues is a framework that integrates environmental challenges with economic, social, political, and ethical concerns in education for sustainable development, or ESD. Multiple fields and organizations must oversee the dissemination of information regarding sustainable development and its diverse dimensions (Tekbiyik & Celik, 2022). Education for Sustainable Development highlights the areas where higher education aims to enhance graduates' sustainability skills. Education aimed at fostering changes in knowledge, skills, values, and attitudes to create a more just and sustainable society for everyone is referred to as education for sustainable development, or ESD. Through a balanced and holistic method addressing the economic, social, and environmental facets of sustainable development, ESD aims to empower and prepare current and future generations to meet their needs (Leicht, & Byun. 2021).

Sustainability awareness is a complex concept that encompasses behaviors, beliefs, and understanding regarding environmental, social, and economic concerns to enable the transition to a sustainable future. Sustainable development education promotes various skills, such as critical analysis, future scenario planning, and teamwork in decision-making (Olsson, et al., 2022).

Biasutti and Frate (2022) state that tools for education in sustainable development emphasize three aspects: knowledge, behavior, and attitude. Knowledge encompasses an understanding of a topic, along with the extent of one's information or awareness; behavior pertains to an individual's actions and encompasses an organism's

responses to stimuli, as well as a person, group, or human's reaction to their surroundings; attitudes refer to a cognitive stance, feelings, or emotions regarding a fact or situation; a mental stance, feelings, or emotions concerning a truth or condition are termed attitudes (**Online Dictionary, 2020**).

Social media, which has a definition that is broadening and constantly evolving, is utilized by billions of individuals across the globe. The term generally pertains to online tools that allow individuals and societies to exchange information, ideas, images, and various content; in a professional context, healthcare professionals utilize social media to promote professionalism, enhance individual awareness, engage patients, debate health care regulations and practice matters, promote healthy behaviors, and spread health information to the community (**Dictionary O. Social media: Oxford Dictionary, 2022**).

More than 3.2 billion individuals worldwide actively use social media, and this number continues to rise. The role of social media varies among users versus non-users, across different age brackets, and among various demographic groups. The role of social media is continuously changing as technological advancements are linked to shifts in language and culture. Social media is becoming more prevalent in the healthcare sector to enhance communication, disseminate accurate information, and raise awareness regarding support, treatments, and self-care options (**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. Additionally, a plethora of global studies on the broader topic of Higher Education for Sustainable Development (ESD) provides crucial new perspectives (**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., 2022**). 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 role of social media-based educational guidelines on enhancing sustainability development in nursing education students.

Aim of the study:

The study aimed to determine the role of social media-based educational guidelines on enhancing sustainability development in nursing education students through the following objectives:

- 1- Assessing nursing students' knowledge regarding sustainability development
- 2- Assessing nursing students' attitudes regarding sustainability development
- 3- Assess nursing students' behavior regarding sustainability development
- 4- Designing social media-based educational guidelines based on the needs of nursing students.
- 5- Implementing social media-based educational guidelines based on the needs of nursing students
- 6- Evaluating the effect of social media-based educational guidelines on enhancing nursing students' knowledge, attitudes, and behavior regarding sustainability development.

Research hypothesis:

Social media-based educational guidelines expected to improve nursing students' knowledge, attitudes, and behavior mean scores regarding sustainability development

Operational Definition:

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

Sustainability development: is initially defined operationally as the knowledge of nursing students, assessed through a knowledge questionnaire, regarding their sustainability development score. Secondly, the nurses' perspective on their sustainable development score is assessed through the attitude questionnaire. Third, the actions of the nursing students were assessed using a behavior questionnaire related to their sustainability development score (**Gericke et al., 2021**).

SUBJECTS AND METHOD:

Design:

To complete this study a quasi-experimental research design one group pre & post-test was used. .

Setting:

The study was applied in the Faculty of Nursing, Sohag University in Egypt using an online questionnaire via Google Form and submitting the following link (<https://docs.google.com/forms/dle/1FHLP HKsd>)

Subjects:

A convenience sample of all 600 nursing students were enrolled in the fourth academic year and 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. Those nursing students completed an online Google Form that was opened on 15 and 30 February 2025 for about fifty days after the link was closed.

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 participants' demographic characteristics
2. Second, the Sustainability Knowledge Questionnaire (SNQ)
3. The SAQ or Sustainability Attitudes Questionnaire
4. Questionnaire on Sustainability Behavior (SBQ)

The initial section of the survey addressed gender, academic year, awareness of sustainable development, and sources of information. 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 60% of the overall score, it indicates unsatisfactory knowledge while satisfactory knowledge is defined as achieving 60% or more of the total score.

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 35 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:

All 17 behavior assessment items for nursing students utilized 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 (Chronbach 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 60 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 **Sohag 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:

Approval for ethical considerations was secured from the Ethics Committee of the Faculty of Nursing at Sohag University. 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 guidelines on the topic. The use of the sustainability development Social Media-Based Educational Guidelines was derived from the outcomes of the knowledge, attitude, and behavior assessments conducted with nursing students, along with their level of agreement prior to the intervention.

The sustainability development intervention included the following topics:

- -Concept of climate change.
- -Effects of climate change.
- -The concept of enduring development and viability.
- -The connection between climate change and sustainability.
- -Goals for Sustainable Development.
- -Difficulties faced by nursing students regarding sustainability
- - The role of nursing in relation to climate change.
- -Nursing's role in promoting sustainable development.
- -The essential understanding of sustainable development, encompassing the environmental, social, and economic aspects.
- -Optimistic outlook on sustainability sustainable development, encompassing the environmental, social, and economic aspects.
- -Positive conduct regarding the advancement of sustainability, covering the environmental, social, and economic realms.
- -The condition of health and sustainability

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 15 and 30, 2024 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 expected outcomes on the initial page of the survey. Prior to the execution of social media-centered Educational Guidelines, every nursing student involved in the study was provided with the following link.

<https://docs.google.com/forms/dle/1FALPHKs d>. Based on evaluation results, the researchers created social media-based educational 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 regarding the ideas of sustainability, sustainable development, and the connection between climate change and sustainability.

In the fourth session, learn about the theoretical and practical aspects of overcoming sustainability barriers among nursing students and observe instances of scenario-based situations informed by the Sustainable Development Goals.

In the fifth session, explore the theoretical and practical dimensions of the nursing role regarding climate change and sustainable development, and examine a health scenario focused on 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 two months 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) to determine the role of social media-based educational guidelines on enhancing sustainability development in nursing education students.

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 57% of the students were female and 69% of them were living in rural areas.

Figure 1 illustrates that, before the intervention, just 6% of nursing students were aware of sustainability developments.

Figure 2 demonstrates that media and the internet are the main sources of information for 88% of the studied nursing students.

Table (2) confirms that the total mean score for the knowledge dimensions have been improved among the studied nursing students post social media-based educational guidelines with a highly significant improvement ($P < 0.001$).

Figure 3: Presents that 89% of the studied academic nursing students had unsatisfactory knowledge levels regarding sustainability development pre-social media-based educational guidelines while most of them (90%) had satisfactory knowledge post-social media-based educational guidelines with significant improvement at $P < 0.001$.

Table (3) revealed that the total mean scores for the categories of attitude 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 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 98% of the studied nursing students post the social media-based educational guidelines.

Table (4) portrays that the total mean score concerning behavior dimensions 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 93% of the participants having poor behavior towards sustainability development in the social media-based educational guidelines compared to 99% of the studied nursing students post- the social media-based educational guidelines having good behavior.

Table 1: Nursing students' distribution regarding their demographic data (N=600).

Variables	Study group	
	N0.	%
Gender:		
Male	258	43.0
Female	342	57.0
Residence		
Urban	186	31.0
Rural	414	69.0

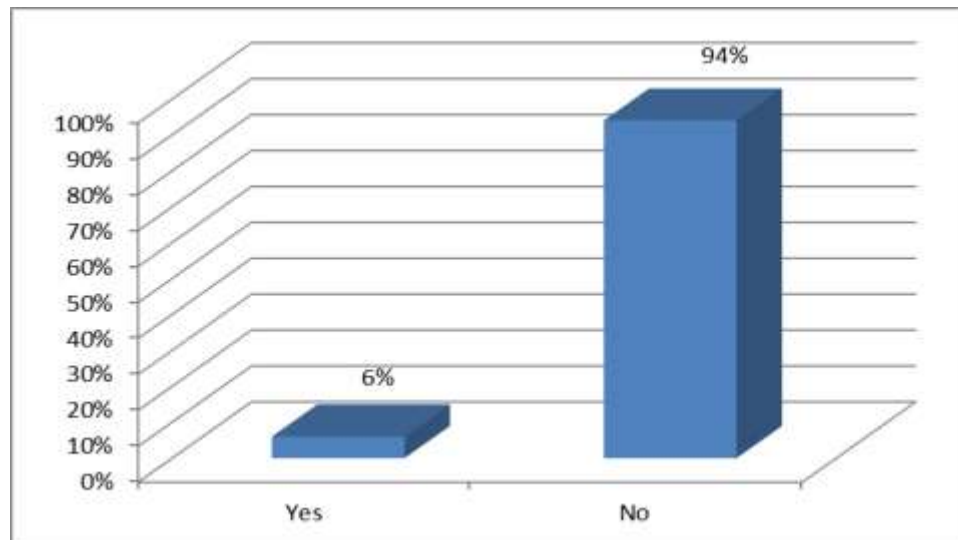


Figure 1: The nursing students' hearing about Sustainability development (n=600).

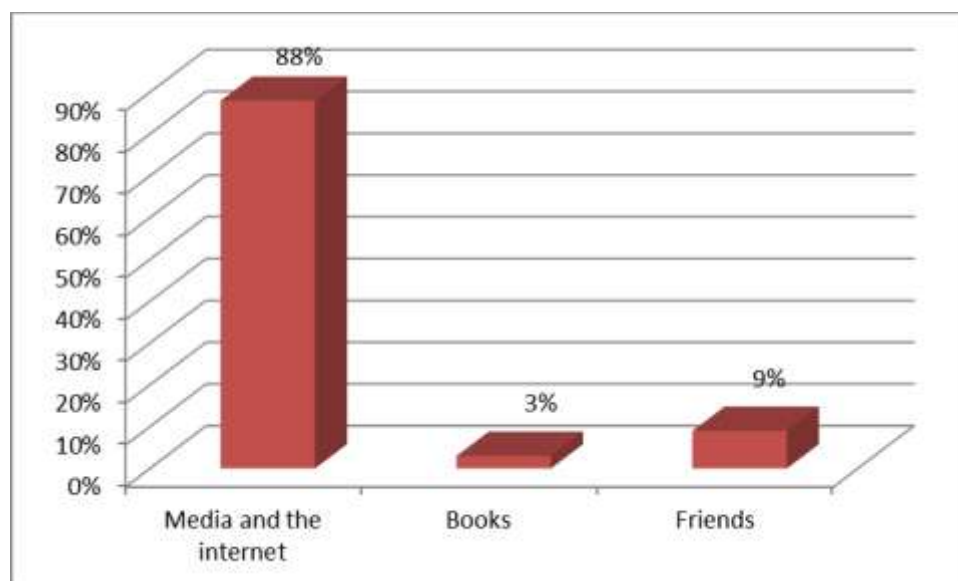


Figure 2: Source of information among nursing students about Sustainability development (N=600).

Table 2: Difference between in total mean scores in knowledge dimensions regarding sustainability development of the studied nursing students pre and post-social media-based educational guidelines (N=600)

Knowledge dimensions	Pre		Post		P- value
	Mean	±SD	Mean	±SD	
Total knowledge score	36.9	9.6	85.3	6.7	t(paired)= 221, 5 P<0.001

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

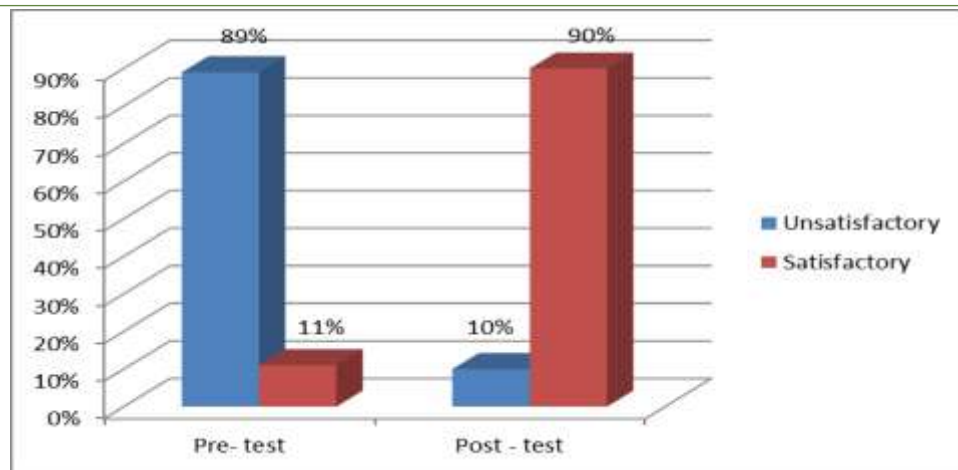


Figure (3): Total knowledge level regarding sustainability development among the studied nursing students pre and post-social media-based educational guidelines (n= 600).

Table 3: Difference between total mean scores in attitude dimensions regarding sustainability development of the studied academic nursing students pre and post-social media-based educational guidelines (N=600)

Attitude dimensions	Pre		Post		P- value
	Mean	±SD	Mean	±SD	
Total attitude score	20.8	4.7	59.5	5.6	t(paired)= 264, 5 P<0.001

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

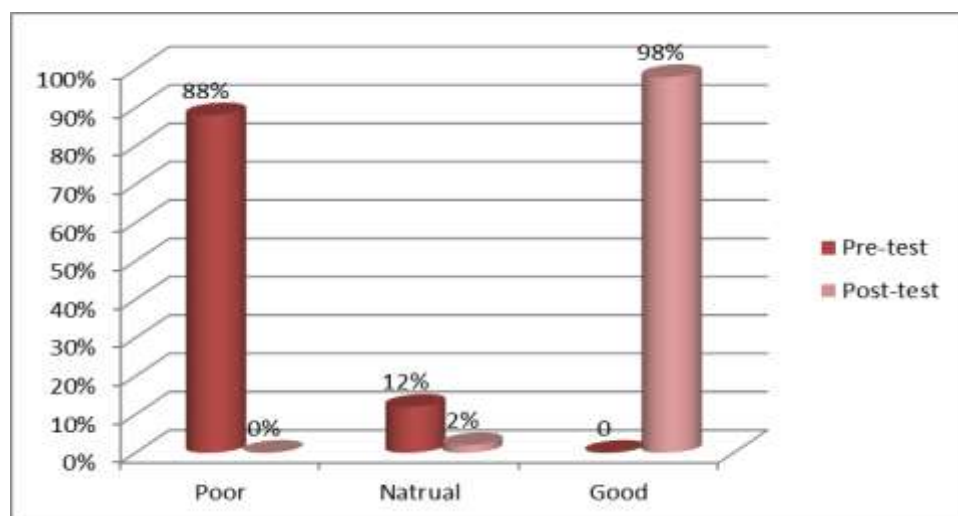


Figure (3): Total attitude level regarding sustainability development among the studied nursing students pre and post-social media-based educational guidelines (n= 600).

Table 4: Difference between total mean scores in behavior dimensions regarding sustainability development of the studied nursing students pre and post-social media-based educational guidelines (N=600)

Behavior dimensions	Pre		Post		P- value
	Mean	±SD	Mean	±SD	
Total behavior score	25.6	6.3	79.6	5.7	t(paired)= 247, 2 P<0.001

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

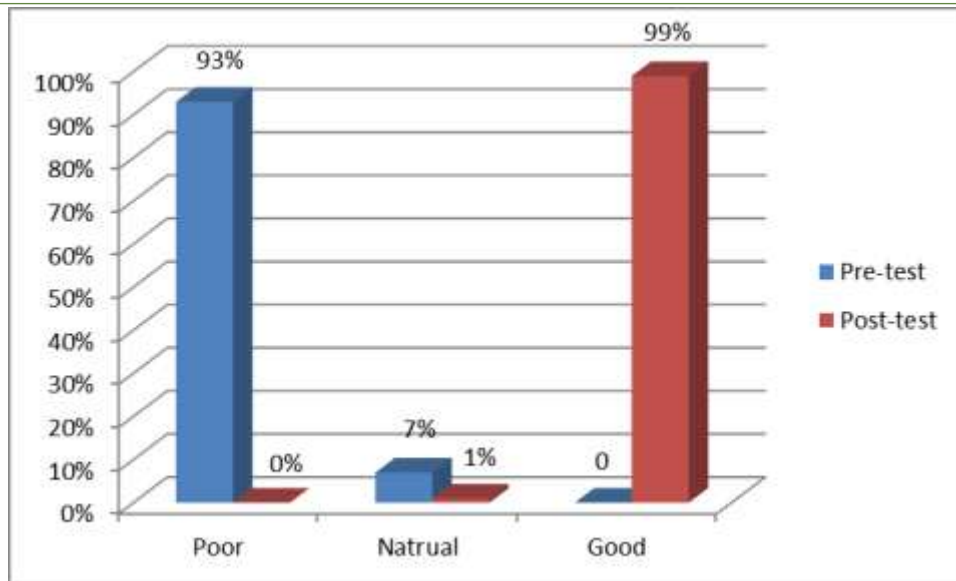


Figure (4): Total behavior level regarding sustainability development of the studied nursing students pre and post-social media-based educational guidelines (n= 600).

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). Hence, the study was conducted to determine the role of social media-based educational guidelines on enhancing sustainability development in nursing education students.

The results indicated a low baseline awareness of Sustainability Development among nursing students pre-intervention. This suggests social media can be a valuable tool for improving nursing students' understanding of sustainability concepts, aligning with their learning preferences and needs.

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 revealed that most nursing students primarily obtained their information from the media and the Internet. The Internet is indeed a dominant means of communication, information sharing, and research among students it's a key aspect of the modern digital landscape. As students' preferred platform: Accessibility: Internet/info is easily reachable. Engagement: Online content can be interactive and appealing. Relevance: Aligns with how modern students consume and process information. From the researchers point of view, Leveraging internet-based strategies (like social media educational guidelines) can effectively enhance nursing students' learning about topics like sustainability development.

The study's findings showed that nursing student' mean scores in the knowledge domains had significantly improved following the implementation of social media- based educational 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 educational guidelines.

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 educational 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 nursing students' mean scores on the knowledge components had significantly

improved after following social media-based educational 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 nursing students under study showed a highly significant improvement following the implementation of social media-based educational 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 (**Álvarez-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 educational guidelines. According to the researchers, it validated the efficacy of using social media-based educational guidelines. 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 guidelines that inspires nursing students to put sustainability development into practice.

For a second reason, these educational guidelines 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 the social media-based educational guidelines has a positive effects on enhancing sustainability development among nursing students.

Recommendations:

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

- 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.
- Replication of the study on sustainability development is recommended to generalize results and extend applicability to larger populations of nursing students.

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