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Awareness of Sustainable Development Goals among Physiotherapy Students: A Cross-Sectional Study in Egypt

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ABSTRACT

Background

Physical therapy plays a key role in achieving sustainable development goals (SDGs) by promoting health and enhancing work capacity. However, limited research has explored physiotherapy students' awareness of this role. This study aimed to assess the awareness and attitudes of physiotherapy students at Benha University regarding the contributions of physical therapy to achieving the SDGs Methods
A cross-sectional study using an online survey was conducted from December 6, 2024, to January 6, 2025, among physiotherapy students at Benha University, Egypt. The questionnaire was developed based on validated studies and modified for context. It was divided into three sections: demographics, general awareness of sustainable development, and the role of physical therapy in achieving SDGs. Test-retest reliability and internal consistency were used to assess the questionnaire's validity and reliability. Data were analyzed using IBM SPSS version 28.

Results
The majority of the students were females (70% females, mean age 21.1±2.1 years). Overall awareness of sustainable development was low (median score 2.0, IQR: 1.0–3.0). Awareness of physical therapy's role in sustainable development was generally high (median attitude score 29.0, IQR: 26.0–31.0). No significant differences were found based on gender, age, or academic year.
Conclusion

This study assessed physiotherapy students' awareness of Sustainable Development Goals (SDGs) and the role of physical therapy in achieving them. Among 333 students surveyed, awareness of SDGs was generally low, although attitudes toward physiotherapy's contribution were positive. Findings highlight the need to integrate sustainability education into physiotherapy curricula to strengthen health professionals' roles in global development.

Keywords: *Awareness, Curriculum Reform, Health Education, Physiotherapy Students, Sustainability Literacy.*

1. Introduction

Sustainability has progressively become a central concern within diverse fields, particularly in the healthcare sector (1). In this context, sustainability in healthcare refers to practices that support human health while remaining environmentally, economically, and socially viable. Although healthcare systems aim to improve public health, they can also generate environmental and health challenges, making sustainable approaches essential for long-term well-being (2,3). A robust health system is defined by its ability to deliver three key elements: improved population

health outcomes, high quality of care that is safe, efficient, and patient-focused, and equitable access, ensuring fairness and inclusivity across all individuals and communities (3). Within the framework of the Sustainable Development Goals (SDGs), health is directly emphasized in Goal 3, but it is also indirectly influenced by other goals that address key determinants such as poverty, education, and the environment. This interdependence highlights the importance of integrated implementation across all goals to ensure meaningful and sustainable progress (4,5).

Physical therapy is a healthcare profession aimed at enhancing movement and maximizing functional capacity across all life stages. it also plays a vital role in managing movement limitations and addressing impairments caused by aging, injury, disease or environmental factors (6,7). Beyond its clinical role, physiotherapy also contributes to broader sustainable development goals. For instance, physiotherapists play a vital role in empowering women and girls by improving their access to essential health knowledge, thereby influencing their decision-making and fostering healthier attitudes and behaviors (6). As a non-drug intervention, physiotherapy reduces reliance on chemical medications, which not only benefits patient health but also lessens the environmental impact of pharmaceutical use (8). Furthermore, physiotherapy may help reduce the carbon footprint of healthcare by preventing or delaying orthopedic surgeries through interventions that improve strength, balance, and gait, thus lowering fall risk an approach aligned with SDG 13 (Climate Action) (9,10).

Education is a key driver for addressing environmental and sustainability challenges while promoting human well-being. Universities play a central role in this process by equipping students with the knowledge, skills, and motivation needed to tackle global sustainability issues (5,11,12). Curricular reforms should integrate sustainability as a core element of professional education, enabling future clinicians to build environmental awareness and apply sustainable values in their daily practice (1). Raising student awareness of sustainability is therefore essential for shaping future healthcare delivery that is both effective and environmentally responsible (13). Although sustainability awareness has been investigated among medical and nursing students, limited research has addressed this topic in the context of physiotherapy education (14). To the best of our knowledge, no studies have specifically examined this topic among physiotherapy students in Egypt, highlighting a critical gap in the literature. Therefore, this study aimed to assess the level of awareness among physiotherapy students at Benha University regarding the role of physical therapy in achieving the Sustainable Development Goals.

2. Material and methods

2.1. Study design and setting:

This cross-sectional survey study was conducted online. A structured questionnaire that included items on demographic data, students' knowledge of sustainable development, and the role of physical therapy in contributing to sustainable development was administered via Google Forms. The survey link was distributed through students' WhatsApp and Telegram groups.

Participants:

This study included 333 undergraduate students of Faculty of Physical Therapy at Benha University, Qalubyia, Egypt.

2.2 Sampling and sample size calculation:

Convenience sampling method was mainly used where the study collaborators efforted to distribute the survey in the social media groups of the students. All undergraduate physiotherapy students at Benha University were invited to participate in the study. The sample size for this study was calculated using the formula for a single proportion, based on the expected awareness of sustainable development among students. As there are no prior studies on physical therapy students' awareness of sustainable development in Egypt, a similar study in Nigeria found that 43% of participants were aware of the Sustainable Development Goals (15). Using this proportion ($p = 0.43$), a 95% confidence level ($Z = 1.96$), and a 5% margin of error ($e = 0.05$), the initial sample size was calculated to be approximately 384 participants. After applying a finite population correction for the total of 2,700 physiotherapy students enrolled at Benha University, the adjusted minimum required sample size was 333 participants.

2.3 Procedures:

A cross-sectional online survey was conducted between December 2024 and January 2025 using an online questionnaire (https://forms.gle/k5YLtDD6te2rF4VP9). The survey questions were adapted from three previously validated and published studies, with minor modifications to fit the study context (16,17,18). The final questionnaire contained seventeen items divided into three sections: (1) demographic data (five questions), (2)

general knowledge of sustainable development (five questions), and (3) the role of physical therapy in achieving the Sustainable Development Goals (seven questions).
The questionnaire included closed-ended questions, dichotomous items (yes/no), and five-point Likert scale questions. Closed-ended items asked participants about demographic information (e.g., age categories, academic year), while dichotomous questions assessed whether students had heard about sustainable development or attended any related courses. The Likert scale questions measured participants' self-reported knowledge of the role of physical therapy in achieving the SDGs, ranging from "Strongly agree" to "Strongly disagree."
The survey was distributed as a Google Forms link through the students' online groups on WhatsApp and Telegram. Data were analyzed using SPSS version 28 for Windows. All participants were informed of the study's purpose and procedures before data collection. Participation was entirely voluntary, and informed consent was obtained from all respondents.

2.4 Test-Retest Reliability
Test-retest reliability of the awareness and attitude scales was assessed using Spearman's rank correlation coefficient and Intraclass Correlation Coefficient (ICC). Each scale was administered twice with a one-week interval.
For Spearman's rho, the correlation between test and retest scores was computed. The awareness score showed a moderate positive correlation ($r = 0.551$, $p = 0.033$), and the attitude score also demonstrated a moderate positive correlation ($r = 0.542$, $p = 0.037$). Both correlations were statistically significant at the 0.05 level, indicating moderate reliability and consistency over time.
For ICC, the awareness score had an ICC of 0.573 (95% CI: 0.104–0.833) for single measures and 0.728 (95% CI: 0.189–0.909) for average measures, with a significance of 0.011. The attitude score had an ICC of 0.466 (95% CI: 0.005–0.776) for single measures and 0.636 (95% CI: 0.009–0.874) for average measures, with a significance of 0.026. These results indicate moderate to substantial reliability for both scales.

2.5 Internal Consistency Reliability
Cronbach's Alpha was calculated to assess the internal consistency of an 8-item scale measuring perceptions of physical therapy students towards Sustainable Development. Cronbach's Alpha was 0.732, indicating acceptable reliability. Inter-item correlations ranged from -0.310 to 0.837, indicating varying degrees of relatedness among items. The results suggest acceptable internal consistency.
Ethical approval:
This study was approved by faculty of physical therapy of Alsalam University research ethical committee (SREC.PT.SUE (8)525).

2.6 Statistical analysis:
All statistical analyses were conducted using SPSS version 28 for Windows. Categorical variables were expressed as frequencies and percentages, while continuous variables were reported as medians (IQR). The normality of the continuous variables was assessed using the Shapiro Wilk test. The median and interquartile range (IQR) were used to describe the non-parametric variables.
The Mann-Whitney U test and Kruskal-Wallis test were used to compare awareness and attitude scores across demographic characteristics. Awareness was assessed using 7 closed-ended questions on Sustainable Development Goals (SDGs), with each correct response scored 1 and incorrect/"don't know" scored 0; the total awareness score ranged from 0–7. Attitudes were measured using 7 items on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), yielding an attitude score ranging from 7–35, with higher scores indicating more positive attitudes. A p-value < 0.05 was considered statistically significant.

Results

Demographic characteristics
A total of 333 undergraduate physiotherapy students from Benha University participated in the study. The majority were female (70.0%, n=233), and most were in their fourth academic year (40.3%, n=134). Participants' ages ranged from 18 to 29 years, with two-thirds between 18 and 21 years. About half of the students (53.5%, n=178) had heard of sustainable development, while only 9.9% (n=33) had attended non-academic courses on the Sustainable Development Goals (SDGs). The demographic distributions are shown in Table 1 and Figures 1–3.

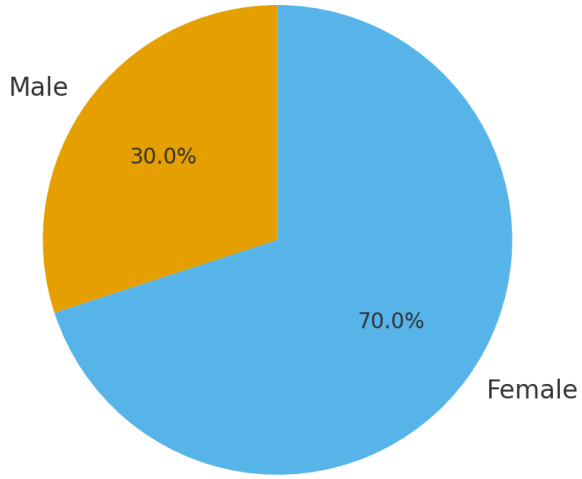

Figure 1. Gender distribution of participants (n=333).

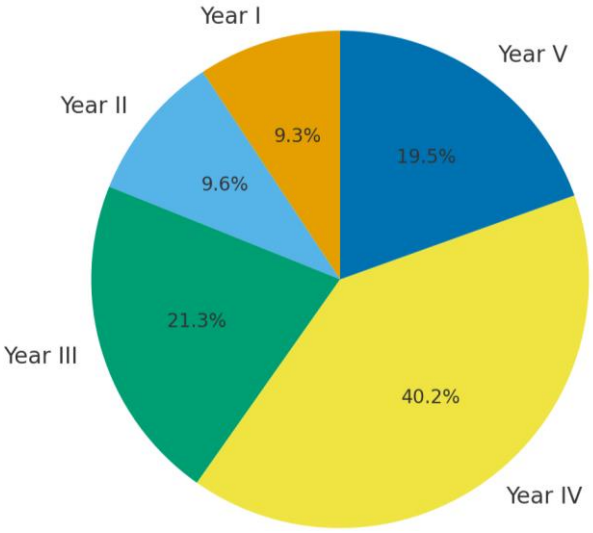

Figure 2. Academic year distribution of participants (n=333).

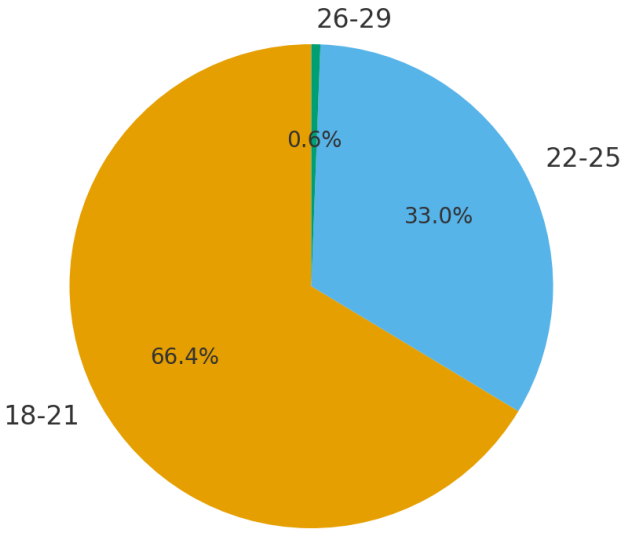

Figure 3. Age distribution of participants (n=333).

Table 1: Demographic characteristics of the participants (n=333)

Variable		N	%
Gender	Male	100	30.0%
	Female	233	70.0%
Academic year	I	31	9.3%
	II	32	9.6%
	III	71	21.3%
	IV	134	40.3%
	V	65	19.5%
Age	18-21	221	66.4%
	22-25	110	33.0%
	26-29	2	0.6%
Have you heard of the sustainable development?	Yes	178	53.5%
	No	155	46.5%
Have you previously attended any specific non-academic courses on Sustainable Development Goals (SDGs)?	Yes	33	9.9%

Awareness of sustainable development

Overall, students demonstrated limited awareness of sustainability concepts. Only 12.0% could correctly identify the number of SDGs, 19.2% knew the United Nations launched them, and 40.8% recognized the target year (2030). The median awareness score was 2.0 (IQR: 1.0–3.0). These results highlight the gap between general awareness and factual awareness of the SDGs, as illustrated in Figure 4 and summarized in Table 2.

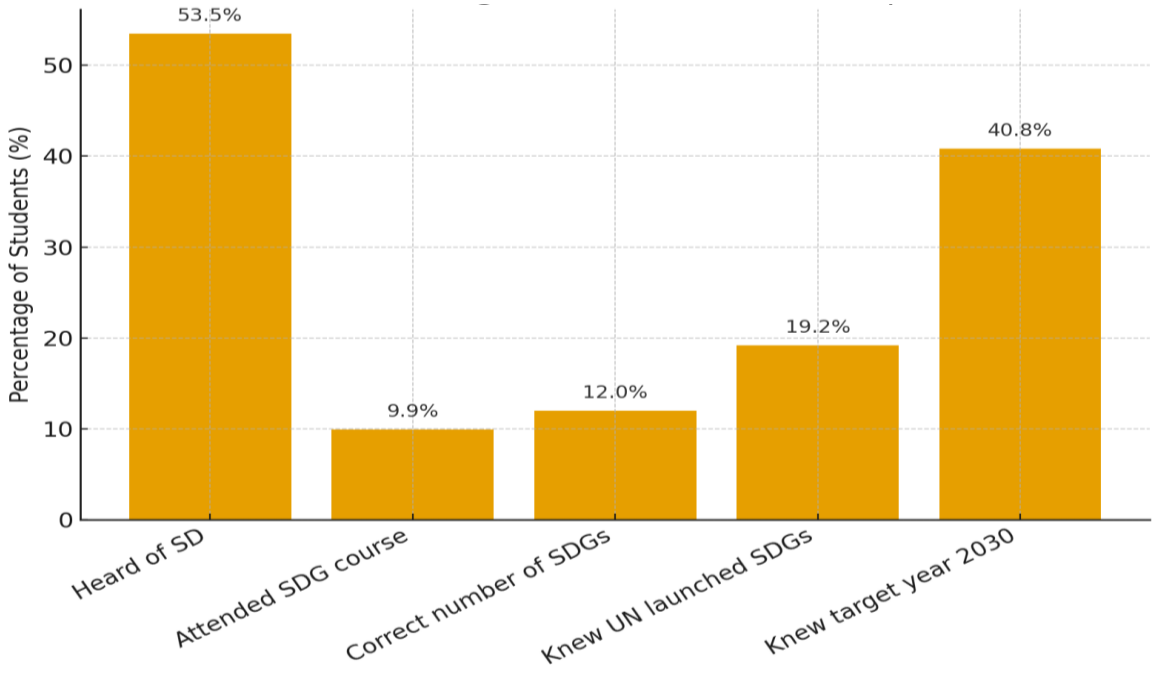

Figure 4. Awareness of sustainable development among physiotherapy students (n=333).

Table 2: Distribution of participants' responses on sustainable development awareness

Question	Correct Answer	Incorrect Answer
Which of the following is a means of achieving sustainable development?	209 (62.8%)	124 (37.2%)
Which SDG ensures sustainable management of good health?	136 (40.8%)	197 (59.2%)
Name the organization that launched the sustainable development goals.	64 (19.2%)	269 (80.8%)
How many sustainable development goals are there?	40 (12.0%)	293 (88.0%)
In which year are the Sustainable Development Goals (SDGs) expected to be achieved?	136 (40.8%)	197 (59.2%)
Knowledge score, Median (IQR)	2.0 (1.0-3.0)	

Attitudes towards physical therapy's role in sustainable development

Students expressed generally positive attitudes toward the role of physical therapy in achieving the SDGs. The majority agreed or strongly agreed that physiotherapy contributes to health promotion, economic productivity, and quality of life. The median attitude score was 29.0 (IQR: 26.0–31.0), reflecting a high level of perceived professional relevance (Table 3).

Table 3: Perceptions of students towards physical therapy's role in sustainable development

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
To what extent do you agree that physical therapy plays a role in eradicating poverty by improving individuals' ability to work?	9 (2.7%)	6 (1.8%)	40 (12.0%)	130 (39.0%)	148 (44.4%)
To what extent do you agree that physical therapy promotes good health and well-being for all ages?	34 (10.2%)	4 (1.2%)	17 (5.1%)	87 (26.1%)	191 (57.4%)
To what extent do you agree that physical therapy reduces environmental impact by decreasing reliance on chemical medications?	20 (6.0%)	15 (4.5%)	50 (15.0%)	127 (38.1%)	121 (36.3%)
To what extent do you agree that physical therapy improves the quality of education by raising health awareness in schools?	19 (5.7%)	25 (7.5%)	86 (25.8%)	121 (36.3%)	82 (24.6%)
To what extent do you agree that physical therapy supports sustainable economic growth by reducing sick leave and improving patient productivity?	17 (5.1%)	3 (0.9%)	44 (13.2%)	155 (46.5%)	114 (34.2%)
To what extent do you agree that physical therapy raises awareness about the importance of chronic disease prevention?	21 (6.3%)	7 (2.1%)	44 (13.2%)	145 (43.6%)	116 (34.8%)
To what extent do you agree that physical therapy improves quality of life for patients as part of sustainable development goals?	25 (7.5%)	4 (1.2%)	19 (5.7%)	113 (33.9%)	172 (51.7%)
Attitude score, Median (IQR)	29.0 (26.0-31.0)				

Subgroup comparisons

No significant differences in awareness or attitude scores were found across gender, age, or academic year. However, students who had prior exposure to sustainable development or attended non-academic SDG courses achieved significantly higher awareness scores ($p < 0.001$, $r = 0.35$; $p = 0.007$, $r = 0.16$, respectively) and more favorable attitudes ($p = 0.041$, $r = 0.12$; $p = 0.002$, $r = 0.18$) (Tables 4–5).

Table 4: Comparison of awareness score across demographic characteristics

Variable		Knowledge score Median (IQR)	P-value
Gender	Male	2.0 (1.0-3.0)	0.558
	Female	2.0 (1.0-3.0)	
Academic year	I	2.0 (1.0-2.0)	0.051
	II	2.0(1.0-3.5)	
	III	2.0(1.0-3.0)	
	IV	2.0 (1.0-3.0)	
	V	1.0 (0-2.0)	
Age	18-21	2.0 (1.0-3.0)	0.225
	22-25	1.0 (0-3.0)	
	26-29	1.0 (1.0-1.0)	
Have you heard of the sustainable development?	Yes	2.0 (1.0-3.0)	**<0.001***
	No	1.0 (0-2.0)	
Have you previously attended any specific non-academic courses on Sustainable Development Goals (SDGs)?	Yes	2.0 (1.0-3.0)	**0.007***
	No	2.0 (1.0-3.0)	

Table 5: Comparison of attitude score across demographic characteristics

Variable		Attitude Score Median (IQR)	P-value
Gender	Male	29.0 (26.0–31.0)	0.839
	Female	29.0 (26.0–31.0)	
Academic year	I	30.0 (27.0–33.0)	0.298
	II	28.0 (24.5–31.5)	
	III	28.0 (26.0–31.0)	
	IV	29.0 (27.0–31.0)	
	V	28.0 (25.0–31.0)	
Age	18–21	29.0 (27.0–31.0)	0.477
	22–25	29.0 (26.0–31.0)	
	26–29	31.5 (30.0–33.0)	
Have you heard of the sustainable development?	Yes	30.0 (27.0–31.0)	**0.041***
	No	29.0 (26.0–31.0)	
Have you previously attended any specific non-academic courses on Sustainable Development Goals (SDGs)?	Yes	30.0 (28.0–33.0)	**0.002***
	No	29.0 (26.0–31.0)	

Discussion

This study explored the awareness of physiotherapy students at Benha University regarding the role of physical therapy in achieving the Sustainable Development Goals (SDGs). The findings indicate that although students showed relatively high awareness of the contribution of their profession to the SDGs, their factual knowledge of sustainability concepts and global frameworks was limited.

When compared with other health professions, the level of awareness observed in this study appears lower. For example, a study among medical students reported that 77.8% of participants had heard of the SDGs and about half could correctly identify the number of goals, whereas in the present study fewer students demonstrated such

knowledge (19). Similarly, a study among Saudi dental students found that 74.1% knew the correct number of SDGs and 68.8% identified the United Nations as the launching organization, which is notably higher than what was observed among the physiotherapy students (16). These differences may be explained by variations in national education policies, differences in the integration of sustainability content within curricula, and broader cultural emphasis on global health and sustainability. Additionally, differences in sample sizes and institutional strategies to promote SDG awareness may have contributed to the variation.

From a theoretical perspective, these results can be interpreted through the lens of sustainability literacy and health literacy frameworks. Sustainability literacy emphasizes not only awareness but also the capacity to critically engage with and apply sustainability concepts in professional and personal contexts. The gap between students' professional awareness and their factual knowledge may reflect a lack of transformative learning opportunities, which are essential for fostering professional identity formation as sustainability-oriented health practitioners. Embedding sustainability-related modules, community projects, or interprofessional education into physiotherapy curricula could enhance students' sustainability literacy and empower them to contribute more effectively to sustainable health systems.

Limitations

This study has several limitations. Its cross-sectional design prevents causal inferences. The use of convenience sampling via online platforms may have introduced selection bias, as students with limited internet access might not have participated. Self-reported data are subject to social desirability bias. Moreover, as the study was conducted at a single institution, the generalizability of the findings is limited.

Future Research

Future studies should employ longitudinal and multi-center designs to track changes in awareness across diverse educational contexts. Mixed-methods approaches are recommended to capture both the breadth and depth of students' understanding by combining quantitative measures with qualitative insights. Interventional studies assessing the impact of curriculum reforms, workshops, or community-based projects on physiotherapy students' sustainability literacy would provide valuable evidence for shaping educational strategies.

Conclusion

This study revealed that physiotherapy students recognized the contribution of their profession to sustainable development but lacked sufficient understanding of sustainability concepts themselves. Addressing this gap requires embedding sustainability principles explicitly into physiotherapy curricula, supported by structured training through workshops, seminars, and international collaborations. Such strategies would not only strengthen students' competencies but also align physiotherapy education with the global agenda of the Sustainable Development Goals, particularly SDG 3 (Good Health and Well-Being) and SDG 13 (Climate Action).

Integrating sustainability into physiotherapy education is therefore more than a local reform; it represents a professional responsibility to prepare graduates who can actively contribute to global health and sustainable development.

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Conflicts of Interest:

The authors declare that they have no conflicts of interest.

References

1) Carvalhais C, Ribeiro I, Xavier A, Saúde M. Sustainability in Allied Health Education and Practice: An Exploratory Survey of Student Perspectives, Knowledge, and Attitudes.

2) Molero A, Calabrò M, Vignes M, Gouget B, Gruson D. Sustainability in Healthcare: Perspectives and Reflections Regarding Laboratory Medicine. Ann Lab Med. 2021 Mar 1;41(2):139–44.

3) Fadda J. Green Healthcare System: Main Features in Supporting Sustainability of Healthcare System—A Review. In: Sayigh A, editor. Green Buildings and Renewable Energy [Internet]. Cham: Springer International Publishing; 2020 [cited 2025 Aug 27]. p. 113–28. (Innovative Renewable Energy). Available from: https://link.springer.com/10.1007/978-3-030-30841-4_8

4) Aftab W, Siddiqui FJ, Tasic H, Perveen S, Siddiqi S, Bhutta ZA. Implementation of health and health-related sustainable development goals: progress, challenges and opportunities – a systematic literature review. BMJ Glob Health. 2020 Aug;5(8):e002273.

5) Ahmed Abdelhakam Ahmed E, Ali Abdelwahab Hassan A, Faiyez Gabra S. Effect of Educational Program on Knowledge, Attitude and Practice of Nursing Students Toward Sustainable Development Goals. Egyptian Journal of Health Care. 2023 Sept 1;14(3):919–32.

6) Narain S, Mathye D. Do physiotherapists have a role to play in the Sustainable Development Goals? A qualitative exploration. South African Journal of Physiotherapy [Internet]. 2019 Apr 25 [cited 2025 Aug 27];75(1). Available from: http://www.sajp.co.za/index.php/SAJP/article/view/466

7) Babur MN, Siddique FR, Awan WA. Future of physical therapy in Pakistan-Satisfaction amongst Pakistani physical therapists about their profession. Isra Medical Journal. 2014;6(1):25–7.

8) Svensson P, Jacobsson M, Palstam A, Lange E. Applying a sustainability perspective in the literature on physical therapy in relation to pharmaceuticals: a scoping review. Front Public Health. 2025 Jan 7;12:1509677.

9) Palstam A, Sehdev S, Barna S, Andersson M, Liebenberg N. Sustainability in physiotherapy and rehabilitation. Orthopaedics and Trauma. 2022;36(5):279–83.

10) Palstam A, Lange E. The role of physiotherapy in promoting sustainable healthcare for global health – editorial. European Journal of Physiotherapy. 2024 Nov;26(6):317–8.

11) Leiva-Brondo M, Lajara-Camilleri N, Vidal-Meló A, Atarés A, Lull C. Spanish University Students' Awareness and Perception of Sustainable Development Goals and Sustainability Literacy. Sustainability. 2022 Apr 11;14(8):4552.

12) Michael FL, Sumilan H, Bandar NFA, Hamidi H, Jonathan V, Nor NM. Sustainable development concept awareness among students in higher education: A preliminary study. Journal of Sustainability Science and Management. 2020;15(7):113–22.

13) Leal Filho W, Azeiteiro UM, Alves F, Molthan-Hill P, editors. Handbook of Theory and Practice of Sustainable Development in Higher Education: Volume 4 [Internet]. Cham: Springer International Publishing; 2017 [cited 2025 Aug 27]. (World Sustainability Series). Available from: http://link.springer.com/10.1007/978-3-319-47877-7

14) Aleixo AM, Leal S, Azeiteiro UM. Higher education students' perceptions of sustainable development in Portugal. Journal of Cleaner Production. 2021;327:129429.

15) Omisore AG. Attaining Sustainable Development Goals in sub-Saharan Africa; The need to address environmental challenges. Environmental development. 2018;25:138–45.

16) Haque S, Nurunnabi M, Haque T. Saudi dental students' perceptions on sustainable development goals and sustainable dental practice. BDJ open. 2024;10(1):40.

17) Ismail TNT, Yusof MIM, Ab Rahman FA, Harsono D. Youth and their knowledge on the sustainable development goals (SDGs). Environment-Behaviour Proceedings Journal. 2022;7(19):329–35.

18) Jati HF, Darsono SNAC, Hermawan DT, Yudhi WAS, Rahman FF. Awareness and knowledge assessment of sustainable development goals among university students. Jurnal Ekonomi & Studi Pembangunan. 2019;20(2):163–75.

19) Ghazi HF, Abdalqader M, Baobaid MF, Hasan TN, Mohammed MF, Shebl HA, et al. Knowledge regarding sustainable development goals (SDG) among medical students at a private university in shah Alam, Malaysia. Global Journal of Public Health Medicine. 2020;2(1):196–202.