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A Study on Generation Z's Knowledge and Awareness Levels Regarding Sustainable (Green) Hospitals

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Abstract

This study aims to determine the knowledge and awareness levels of Generation Z students regarding the concept of sustainable (green) hospitals. The data of this cross-sectional study that designed in a quantitative type, were collected from university students studying in the Medical Documentation and Secretarial Program of a public university in Turkey. In the study, where the complete whole sampling method was used, the data collected from 175 students were analyzed with the IBM SPSS 26 package program. Explanatory Factor Analysis, t-test in independent groups, ANOVA test and correlation analysis were used in the analysis of the data. The findings revealed that although Generation Z students have a low level of knowledge about green hospitals concept, their awareness of the concept is relatively high. It was concluded that especially women and those applying to private hospitals have significantly higher levels of knowledge and awareness about sustainable (green) hospitals compared to others. Moreover, it was observed that as students' awareness of green hospitals increased, their annual hospital visit frequency decreased. This finding illustrate that green hospital awareness may influence not only individuals' consciousness about environmental sustainability but also their behavior in health management. Considering the study findings, it may be beneficial to organize training programs, seminars or applied projects to address students' lack of knowledge.

Key Words: Sustainability, Green Hospital, Carbon Footprint, Generation Z, Student

Z Kuşağının Sürdürülebilir (Yeşil) Hastaneye Yönelik Bilgi ve Farkındalık Düzeylerinin İncelenmesi

Bu çalışmada, Z kuşağındaki öğrencilerin sürdürülebilir (yeşil) hastane konseptine ilişkin bilgi ve farkındalık düzeylerinin belirlenmesi amaçlanmıştır. Nicel desende tasarlanmış olan bu kesitsel türdeki çalışmanın verileri Türkiye'deki bir devlet üniversitesinin Tıbbi Dokümantasyon ve Sekreterlik Programı'nda eğitim görmekte olan üniversite öğrencilerinden toplanmıştır. Tamsayım örnekleme yönteminin kullanıldığı çalışmada 175 öğrenciden toplanan veriler IBM SPSS 26 paket programı ile analiz edilmiştir. Verilerin analizinde Açıklayıcı Faktör Analizi, bağımsız gruplarda t-testi, ANOVA testi ve korelasyon analizi kullanılmıştır. Elde edilen bulgular, Z kuşağının yeşil hastane konusunda düşük düzeyde bilgi sahibi olmasına karşın konuyla ilgili farkındalık düzeylerinin yüksek olduğunu göstermiştir. Özellikle kadınların ve özel hastaneye başvuranların sürdürülebilir (yeşil) hastane konusundaki bilgi ve farkındalık düzeylerinin diğerlerine kıyasla anlamlı derecede daha yüksek olduğu sonucuna varılmıştır. Ayrıca, öğrencilerin yeşil hastane farkındalık düzeyleri yükseldikçe bir yıldaki hastane başvuru sayılarının düştüğü saptanmıştır. Bu bulgu, yeşil hastane farkındalığının bireylerin yalnızca çevresel sürdürülebilirlik bilincini değil, sağlık yönetimindeki davranışlarını da etkileyebileceğini göstermektedir. Çalışma bulguları göz önünde bulundurulduğunda, öğrencilerin bilgi eksikliğini gidermeye yönelik eğitim programlarının, seminerlerin veya uygulamalı projelerin düzenlenmesi faydalı olabilir.

Anahtar Kelimeler: Sürdürülebilirlik, Yeşil Hastane, Karbon Ayak İzi, Z Kuşağı, Öğrenci

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1. Introduction

A warming planet is a concerning global issue, and the healthcare sector is among the contributors to this problem, along with all other industries (Bajwa et al., 2025). In particular, fully equipped healthcare institutions have a large share in greenhouse gas emissions that cause climate change. The healthcare sector is responsible for approximately 4.6% of global greenhouse gas emissions. According to Cohen et al., (2025), if the healthcare sector were considered a country, it would be ranked as the fifth largest greenhouse gas emitter globally. The healthcare sector usually disposes of recyclable materials such as plastic, paper, and metal as general waste. This leads to environmental damage, especially through processes such as landfilling and incineration of waste (Penn et al., 2012).

According to the 2023 Greenhouse Gas Emission Inventory Report published by the Turkish Statistical Institute (TurkStat), Turkey's total greenhouse gas emissions in 2021 were 564.4 million tons of CO2 equivalent. This value shows that total emissions increased by approximately 8% compared to the previous year. Unfortunately, there is no official data on the net impact of hospitals in Turkey on total greenhouse gas emissions. In general, the healthcare sector is a large consumer of energy and natural resources. A constant supply of electricity is required to provide uninterrupted service 24 hours a day. It is known that hospital buildings produce 2.5 times more carbon emissions compared to commercial buildings (Tarkar, 2022).

Hospital buildings and the materials used in their construction play a significant role in the emission of greenhouse gases, which negatively affect the environment and human health (Kara et al., 2024). Therefore, the green hospital concept has emerged as a solution to these problems. This concept aims to benefit society by improving both patients and the environment (Pinzone et al., 2019). For example, it is known that there is a relationship between improved indoor air quality and the reduction in the severity of diseases such as asthma, flu, respiratory issues, and headaches, ranging from 1.5% to 87% (Kumari & Kumar, 2020). Additionally, the development of sustainability initiatives in hospitals provides economic benefits for the institution and facilitates the implementation of green practices (G. Şimşek & A. Özsoy, 2024). For instance, it is known that green building strategies reduce operating costs of buildings by 8-9%, while increasing the building value by 7.5%, bed occupancy rates by 3.5%, and rental income by 3% (Wood et al., 2016).

Green hospitals are also known as environmentally friendly, ecological, or sustainable hospitals (Hoşgör, 2014; Konakoğlu & K. Açıcı, 2021). A green hospital can be defined as a healthcare facility that accepts the environment as an indicator of quality service and attaches importance to the sustainable design of buildings. Such hospitals should have certain characteristics, including selecting an appropriate strategic location (Fardi et al., 2022), efficient use of water (Sahamin & Zakaria, 2014) and energy (McGain & Naylor, 2014), the use of environmentally friendly transportation in logistics activities (Norouzi et al., 2021), air pollution control (Filippini et al., 2019), and the use of eco-friendly building materials (Brunet et al., 2024). A green hospital maintains indoor environmental quality (Huang et al., 2020), offers sustainable healthy food for staff and patients (Carino et al., 2020), provides green education programs (Ryan-Fogarty et al., 2016), focuses on green products, creates non-toxic environments (Hydari et al., 2020), implements green cleaning practices, reduces waste (Kwakye et al., 2011), offers a healing garden for patients (Lattanzio et al., 2022), and positively affects the mental health of patients and their families (McCormick, 2017).

The greenness levels of hospitals around the world are evaluated by various rating systems. These rating systems express the standards set to evaluate the environmentally friendly practices of healthcare institutions and encourage them to achieve sustainability goals (Hussain and Sheikh, 2023). In general, these systems can be listed as follows: LEED (Sadatsafavi and Shepley, 2016), BREEAM (Lim and Yoon, 2015), GREEN STAR (Pillay and Saha, 2024), ENERGY STAR (Dahlan et al., 2022), CASBEE (Yoon and Lim, 2016), GREEN GLOBES (Reeder, 2010), WELL Building Standard (Allen et al., 2015), Green Mark Scheme (Dhillon and Kaur, 2015), EDGE (Perdana et al., 2023), DGNB (Brunsgaard, 2016), GGHC (Paradinuk, 2009).

There is no definitive data on the number of healthcare institutions with green hospital certificates in Turkey. Green hospital applications in Turkey are still in the development phase compared to applications around the world. In order to increase energy efficiency in this area, the “Energy Efficiency in Healthcare (SEVER) Project” was implemented, and the “Public-Private Hand in Hand for Energy Efficiency” Project was launched with the support of the Ministry of Health, the Ministry of Environment and Urbanization, and the Ministry of Energy and Natural Resources. In addition, the “Green Hospital” process has begun in Turkey with the Ministry of Health making LEED certification mandatory in hospitals with 200 beds and above (T. Kurtaran and Yeşildağ, 2021; Baytaş and Ç. Aydın, 2022; Eser, 2023). On the other hand, it is known that the source of this interest in green buildings in Turkey is private sector organizations rather than the public (Ö. Karaca et al., 2018).

Within the scope of the Ministry of Health's green hospital project, light bulbs were changed to save energy and insulation problems were solved. In this way, 50 million liras were saved in fuel, lighting and water expenses in hospitals. In addition, a study conducted on 53 LEED-certified hospitals found that the installation and profitability rates of these hospitals were higher than non-certified hospitals. In addition, patient satisfaction and income per bed were found to be higher in LEED-certified hospitals compared to non-certified hospitals (Yıldız, 2016; Eser, 2023).

Sustainability in healthcare institutions is important in terms of ensuring the comfort of patients while coping with their illnesses. Otherwise, patients feel uncomfortable due to both the burden of the unsustainable physical environment and the burden of the disease (Setyowati et al., 2013). In this respect, the process of hospitals becoming green is quite difficult and this process can bring some disadvantages for hospitals. These disadvantages can be listed in three groups as follows: high initial costs (Danilov et al., 2020), long payback period of investment (Wang et al., 2016), insufficient technical expertise and training (Balaji et al., 2014), and design and planning difficulties, local and legislative barriers (Alkaabi and Aljaradin, 2022).

The second group includes as follows: maintenance and operation difficulties (Seifert, 2018), lack of knowledge and awareness (Vallée, 2024), cultural and social barriers (Dion et al., 2023), and waste management difficulties (Quttainah and Singh, 2024). The third group includes as follows: lack of organizational and governmental supports (Luthra et al., 2011), time-consuming adoption of green building technologies and delay of projects (Ebekozien et al., 2022), restrictions on location selection (Balabel and Alwetaishi, 2021) and accreditation and licensing (Kumari and Kumar, 2020).

In summary, green hospitals save energy, reduce resource consumption and carbon footprint, protect patient and employee health, and provide positive contributions to society and the environment by providing sustainable health services. Based on this, determining the level of green hospital awareness is a very important initiative for health service providers, health service users, health financiers, health decision makers, governments, society and higher education institutions. In particular, health service vocational schools are important educational institutions that train qualified human resources for the health sector. The sustainability awareness of university students studying in these institutions and in Generation Z will contribute to the adoption of environmentally sensitive approaches both in their professional lives and in society in general. Therefore, this study aimed to determine the knowledge and awareness levels of students studying in the Medical Documentation and Secretarial Program regarding the concept of sustainable (green) hospitals. In addition, it was observed that there is no research examining the knowledge and awareness levels of university students representing Generation Z in the current literature. In this context, it can be said that the study will contribute to filling the gaps in the literature. Therefore, within the scope of this study, answers have been sought to the questions of whether there are statistically significant differences and relationships between students' descriptive characteristics and their levels of sustainable (green) hospital awareness.

2. Method

2.1.Design of the Study

This study was designed in a quantitative pattern. The data of this cross-sectional study were collected from university students studying in the Medical Documentation and Secretarial Program at a public university in Turkey.

2.2.Study Universe and Sample

The study universe consisted of all active students enrolled in the relevant program in the 2023-2024 Spring semester. Complete whole sampling method was used. It was planned to reach all students and data was collected from 175 students. In this context, the sample representativeness of the universe was calculated as 93%.

2.3.Data Collection Method and Tools of the Study

An e-survey prepared via Google Forms was used to collect data. The data was collected in a five-day period in June 2024. The Green Hospital Design Scale was used to collect data. This scale, developed by Wood et al. (2016), was translated into Turkish by Mansur and Korkmaz (2020) and reliability and unidimensionality analysis were performed. Since the factor loading of each statement in the scale was above 0.50, it was reported that the scale was valid. It was determined that the scale, which included a total of 24 items, consisted of five sub-dimensions. These sub-dimensions, item numbers and Cronbach Alpha (Cα) internal reliability coefficients are reported as follows:

* Energy efficiency [4 items- Cα: 0.73]
* Indoor environmental quality [6 items- Cα: 0.75]
* Sustainable site planning and management [5 items- Cα: 0.79]
* Materials and resources [6 items- Cα: 0.94]
* Water efficiency [3 items- Cα: 0.80]

The overall Cα coefficient value of the scale was stated to be quite high at 0.94 and a 5-point Likert scale was used (1: Never, 2: Rarely, 3: Sometimes, 4: Often, 5: Always). Although the scale of Mansur and Korkmaz (2020) was taken as the basis within the scope of the study, the expressions were revised in general. For example, the expression “I pay attention to whether renewable energy is used in the hospital” in the main study was transformed into ““The use of renewable energy is important in the hospital” within the scope of this study. The expression “I pay attention to whether long-lasting materials that ensure material safety are used in the hospital” in the main study was transformed into “It is important to use long-lasting materials that ensure material safety in the hospital” within the scope of this study. Therefore, the 5-point Likert scale used in the reference study was revised as

follows: (1: Strongly disagree, 2: Disagree, 3: Undecided, 4: Agree, 5: Strongly agree). Unlike the referenced study, this study includes a total of 23 scale items, 12 of which will be reverse coded (4, 5, 7, 9, 11, 12, 14, 15, 17, 21, 22, 23). In addition to the scale statements, the study includes six questions regarding the participants' descriptive characteristics such as age, gender, and grade. The students' knowledge levels on the subject were determined with three dichotomous questions.

2.4.Analyses Used in the Study

The IBM SPSS 26 package program was used in the analysis of the data. In addition to descriptive statistics, it was determined that the data had skewness and kurtosis values between -1 and +1. According to Tabachnick and Fidell (2007), the fact that the data are in these value ranges is interpreted as the data exhibiting a normal distribution. Therefore, the Explanatory Factor Analysis, t-test in independent groups, ANOVA test and correlation analysis from parametric tests were used in the study. Explanatory Factor Analysis is used to group variables, the t-test determines the difference between two groups, ANOVA examines differences among multiple groups, and correlation analysis measures the relationship between variables. The 95% confidence interval and $p<0.05$ statistical significance level were taken as basis in the evaluation of the obtained findings. In interpreting the correlation analysis results, Büyüköztürk (2007)'s reference ranges were used as a basis (0.00–0.30: low-level relationship; 0.30–0.70: moderate-level relationship; 0.70–1.00: high-level relationship).

3. Findings

Table 1 shows that 71.4% of the participants are female, 53.1% are aged 21 years or older ($\bar{x}$: 20.9 ± 1.76), and 57.7% are second-year students. Additionally, 46.9% reside in urban centers, 64% visited a hospital 1-5 times within a year ($\bar{x}$: 5.8 ± 4.4), and 41.1% primarily utilized public hospitals.

Table 1. Distribution of Participants' Descriptive Characteristics

Variables	Groups	f	%
Gender	Female	125	71.4
	Male	50	28.6
Age	≤ 20	82	46.9
($\bar{x}$: 20.9±1.76)	≥ 21	93	53.1
Class	1st Year	74	42.3
	2nd Year	101	57.7
The Place Lived the Longest	Province	82	46.9
	District	43	24.5
	Villace	50	28.6
Frequency of Hospital Visits in One Year	1-5 times	112	64.0
($\bar{x}$: 5.8±4.4)	6-10 times	43	24.6
	11 times and above	20	11.4
Type of Institution Visited	Public Hospital	72	41.1
	Private Hospital	12	6.9
	University Hospital	30	17.1
	City Hospital	35	20.0
	Family Health Center	26	14.9
TOTAL		**175**	**100.0**

Table 2 reveals that 70.3% of the participants had never heard of the green hospital concept before, 92% had not attended any academic events related to the topic, and 80% were unaware of the existence of green hospital-certified hospitals in Turkey.

Table 2. Distribution of Participants' Knowledge Levels

Variables	Groups	f	%
Have You Heard of the Green Hospital Concept?	Yes	52	29.7
	No	123	70.3
Have You Attended Any Training or Conference Related to Green Hospitals?	Yes	14	8.0
	No	131	92.0
Are You Aware That There Are Green Hospital Certified Hospitals in Turkey?	Yes	35	20.0
	No	140	80.0

Table 3 indicates that the KMO value is 0.895, which is greater than the acceptable threshold of 0.60 for factor analysis (Büyüköztürk, 2007). Additionally, the X^2 value is 2251.970, the df value is 253, and the p-value is 0.000. These results demonstrate that the sample meets the necessary criteria for conducting factor analysis. To determine the number of factors in the scale, the Principal Components Analysis method was applied, with Varimax rotation used for rotation. Principal Component Analysis (PCA) was used to reduce the number of variables and reveal the underlying structure of the dataset. The Varimax rotation method was chosen to maximize the independence of factors, enhance the clarity of variable loadings on specific factors, and facilitate interpretation. The analysis revealed that the scale consists of five factors. The factor loadings of the items range between 0.507 and 0.873, with a total of 23 items. The scale's total variance explained is 65.383%. The Cα values for the sub-dimensions of the scale range from 0.709 to 0.867, while the overall scale's Cα is 0.892. According to Field (2005), a Cronbach's alpha internal consistency coefficient of 0.70 or higher is interpreted as indicating high internal consistency and reliability of the scale. Therefore, these values indicate a high level of internal consistency and reliability for the scale and its sub-dimensions.

Table 3. Results of the Exploratory Factor Analysis of the Scale

Sub-dimensions	Items	Factor Loadings	Cα
Energy Efficiency	M_1	0.728	0.771
($\bar{x}$: 4.44±0.65)	M_2	0.873	
	M_7	0.815	
Indoor Environmental Quality	M_3	0.839	0.709
($\bar{x}$: 4.24±0.65)	M_4	0.654	
	M_5	0.740	
	M_6	0.799	
	M_8	0.795	
Sustainable Site Planning and Management	M_9	0.630	0.728
($\bar{x}$: 4.10±0.76)	M_10	0.608	
	M_11	0.553	
	M_12	0.636	
	M_13	0.636	
	M_14	0.615	
	M_15	0.539	
Materials and Resources	M_16	0.813	0.743
($\bar{x}$: 4.34±0.68)	M_17	0.507	
	M_18	0.628	

Table 3. Results of the Exploratory Factor Analysis of the Scale (continue)

	M_19	0.739	
	M_20	0.572	
Water Efficiency	M_21	0.632	0.867
($\bar{x}$: 4.39±0.88)	M_22	0.766	
	M_23	0.697	

Overall Scale Mean [$\bar{x}$: 4.26±0.59]
Overall Scale Cα: 0.892
KMO: 0.895
Results of Bartlett's Test of Sphericity: [X^2: 2251.970; **df:** 253; **p:** 0.000]

The participants' mean scores for the sub-dimensions of "Energy Efficiency" ($\bar{x}$: 4.44 ± 0.65), "Indoor Environmental Quality" ($\bar{x}$: 4.24 ± 0.65), "Materials and Resources" ($\bar{x}$: 4.34 ± 0.68), and "Water Efficiency" ($\bar{x}$: 4.39 ± 0.88) were found to be very high, while the mean score for "Sustainable Site Planning and Management" ($\bar{x}$: 4.10 ± 0.76) was high. Additionally, the students' overall scale mean was determined to be very high (Table 3).

Table 4 reveals a statistically significant difference between gender and the Sustainable (Green) Hospital Awareness Scale mean score ($p < 0.05$). This significant difference was attributed to female students. On the other hand, no statistically significant differences were found between the scale mean score and other descriptive variables of the participants ($p > 0.05$).

Table 4. Differences Between Participants' Descriptive Characteristics and Scale Means (t-Test)

Variables	Groups	$\bar{x}$ ±	t	p
Gender	Female	4.34 ± 0.47	2.676	***0.008*** **
	Male	4.08 ± 0.79		
Class	1st Year	4.32 ± 0.54	1.148	0.253
	2nd Year	4.22 ± 0.62		
Have You Heard of the Green Hospital Concept?	Yes	4.25 ± 0.58	-0.549	0.584
	No	4.30 ± 0.62		
Have You Attended Any Training or Conference Related to Green Hospitals?	Yes	4.29 ± 0.55	1.052	0.311
	No	4.02 ± 0.92		
Are You Aware That There Are Green Hospital Certified Hospitals in Turkey?	Yes	4.26 ±0.56	-0.114	0.910
	No	4.28 ± 0.70		

** **p<0.01**

Table 5 indicates that there is no statistically significant difference between the participants' longest-lived place and the Sustainable (Green) Hospital Awareness Scale mean score ($p > 0.05$). On the other hand, a statistically significant difference was found between the type of healthcare institution visited by the participants and the scale mean score ($p < 0.05$). The Tukey post-hoc test revealed that this significant difference was due to participants who visited private healthcare institutions compared to those who visited public hospitals.

Table 5. Differences Between Participants' Descriptive Characteristics and Scale Means (ANOVA Test)

Variables	Groups	$\bar{x}$ ±	F	p
The Place Lived the Longest	Province	4.20 ± 0.66	0.946	0.390
	Disrtict	4.34 ± 0.55		
	Villace	4.31 ± 0.48		
Frequency of Hospital Visits in One Year ($\bar{x}$: 5.8±4.4)	(1) 1-5 times	4.49 ± 0.39	3.129	***0.016**** 2<1
	(2) 6-10 times	4.23 ± 0.60		
	(3) 11 times and above	4.38 ± 0.44		
Type of Institution Visited	(4) Public Hospital	4.03 ± 0.70		
	(5) Private Hospital	4.47 ± 0.50		

**** p<0.05**

Table 6 shows positive and statistically significant relationships ($p < 0.05$) between the overall scale and all its sub-dimensions, with values ranging from 0.757 to 0.861. According to Büyüköztürk (2007), these values can be stated that there are highly significant and positive relationships between the scale and its sub-dimensions. While no statistically significant relationship was observed between participants' overall scale means and their ages, a negative and significant relationship ($p < 0.05$) was found between the overall scale means and their average number of hospital visits. On the other hand, no statistically significant relationships ($p > 0.05$) were identified between participants' ages and their average number of hospital visits with both the overall scale and sub-dimension means.

Table 6. Relationship Between Participants' Descriptive Characteristics and Scale Means (Pearson Correlation Test)

Variables		2	3	4	5	6	7	8
(1) Energy Efficiency	Correlation	0.780**	0.617**	0.576**	0.622**	0.839**	-0.139	-0.125
	p	0.000	0.000	0.000	0.000	0.000	0.067	0.100
(2) Indoor Environmental Quality	Correlation		0.589**	0.521**	0.579**	0.827**	-0.051	-0.037
	p		0.000	0.000	0.000	0.000	0.501	0.689
(3) Sustainable Site Planning and Management	Correlation			0.501**	0.583**	0.861**	-0.034	-0.075
	p			0.000	0.000	0.000	0.656	0.322
(4) Material and Resources	Correlation				0.524**	0.757**	0.097	-0.133
	p				0.000	0.000	0.203	0.079
(5) Water Efficiency	Correlation					0.784**	-0.081	-0.131
	p					0.000	0.286	0.085
(6) Overall Scale	Correlation						-0.037	-0.150*
	p						0.624	0.047
(7) Age	Correlation							-0.045
	p							0.571
(8) Frequency of Hospital Visits in One Year	Correlation							
	p							

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

4. Discussion, Conclusion, And Recommendations

Today, environmental sustainability is becoming increasingly important in many fields, including the healthcare sector. The concept of a sustainable (green) hospital, which aims to minimize the environmental impact of healthcare institutions and ensure the efficient use of resources, is based on both an environmentally conscious approach and innovative practices that support public health. This concept, which includes elements such as energy efficiency, waste management, water conservation, and the reduction of chemical use, not only provides environmental benefits but also offers many advantages in terms of economic and social sustainability. In this context, examining the level of knowledge and awareness of the green hospital concept among young university students, defined as Generation Z and highly sensitive to technology and innovation, is critical for the future of the healthcare sector. Therefore, this study aims to determine the level of awareness regarding the sustainable (green) hospital concept among students enrolled in the Medical Documentation and Secretarial Program.

The study results showed that young adults visit hospitals approximately six times a year, with the majority seeking care at public hospitals. Additionally, it was determined that 70% of students had never heard of the green hospital concept, 90% had not attended any academic events related to the topic, and 80% were unaware of the existence of green hospital-certified hospitals in Turkey. In summary, it was concluded that the students had a low level of knowledge about green hospitals. Considering that these participants are studying in a health-related field, the results are surprising. Although there are limited specific scientific articles examining the knowledge and awareness of the green hospital concept, there are studies evaluating the awareness of healthcare users (Kılıç & Güdük, 2018; Mansur & Korkmaz, 2020), healthcare professionals (Aljohani et al., 2023; Luque-Alcazraz et al., 2024; Bano et al., 2024), hospital administrators (Gemlik et al., 2019), university students studying in health-related departments (Indhulekha et al., 2018; G. Şimşek & Erkin, 2022; Soliman et al., 2023; Tokhol, 2023; Aly et al., 2024), and society in general (Hoşgör et al., 2023; Nurfikri et al., 2024) on this topic.

In a study conducted with nursing students in Turkey (G. Şimşek & Erkin, 2022), it was reported that more than half of the students were not knowledgeable about sustainable development goals, yet they showed overall awareness above average. In a study on Generation X, Y, and Z (Hoşgör et al., 2023), it was found that participants did not possess sufficient environmental awareness. Another study on nursing students (Tahkol, 2023) revealed that the students had not received adequate education on sustainability and climate change. In a study conducted with dental students in India (Indhulekha et al., 2018), it was concluded that none of the students were knowledgeable about biomedical waste management and that they needed education on the topic.

In this study, it was found that the students had a high level of awareness regarding "Energy Efficiency," "Indoor Environmental Quality," "Materials and Resources," "Water Efficiency," and "Sustainable Site Planning and Management." Overall, it was concluded that the Generation Z students in this study had a very high level of green hospital awareness. Despite the students having low levels of knowledge on the subject, their high level of awareness about green hospitals can be seen as a surprising result. This suggests that there may not always be a direct relationship between knowledge level and awareness, and that awareness can be shaped by environmental, cultural, and social factors. Such a situation may also indicate the need for educational programs to be restructured to enhance the knowledge level. Similarly, a study conducted in Indonesia and Taiwan (Nurfikri et al., 2024) reported that each additional value introduced to create public awareness contributed to strengthening the image of sustainable green hospitals. In a study on Spanish nurses (Luque-Alcaraz et al., 2024), it was concluded that nurses with a higher level of environmental awareness were more likely to engage in sustainable behaviors such as waste reduction, energy saving, and environmentally conscious purchasing decisions.

In a study conducted in Turkey (Mansur & Korkmaz, 2020), in parallel with the findings of this research, it was found that healthcare users had a high level of awareness regarding "Indoor Environmental Quality," "Materials and Resources," and "Sustainable Site Planning and Management." Another study conducted in Turkey (Kılıç & Güdük, 2018) also concluded that healthcare users had high awareness and expectations regarding the features of green hospitals. In contrast to these results, a study by Gemlik et al. (2019) reported that hospital managers lacked knowledge about green hospital practices. In another study conducted with healthcare providers in Saudi Arabia (Aljohani et al., 2023), it was concluded that healthcare professionals were not fully aware of environmentally friendly practices such as green hospitals.

As a result of the study, it was found that female students had a significantly higher level of sustainable (green) hospital awareness. These findings suggest that awareness levels are closely related to individual characteristics such as gender and the type of healthcare service experienced. Generally, women may show more interest in environmental issues and be more inclined to adopt sustainability practices. In this context, some studies (Hoşgör et al., 2015; Kılıç & Güdük, 2018; G. Şimşek & Erkin, 2022) indicate that women are generally more sensitive to environmental, health, and sustainability issues.

Additionally, it was concluded that students who visited private healthcare institutions had a significantly higher level of green hospital awareness compared to those who visited public hospitals. Private healthcare institutions often have more modern infrastructure, a comfortable interior and exterior environment, and up-to-date sustainability practices. This may allow students visiting these institutions to directly observe green hospital practices and increase their awareness. Private healthcare institutions often use environmentally friendly practices as part of their marketing strategy. This may not only make students more aware of such

practices but also influence their decision to prefer these hospitals. Indeed, the findings of Hoşgör and Hoşgör (2019) support this. In their study, it was reported that preferred physical features and high-quality hospitality services positively impacted patients' hospital choices.

The study results showed that as the participants' awareness of green hospital concepts increased, their awareness of the sub-dimensions of "Energy Efficiency," "Indoor Environmental Quality," "Materials and Resources," "Water Efficiency," and "Sustainable Site Planning and Management" also rose. While no significant relationship was found between participants' age and green hospital awareness levels, a negative and significant relationship was found between the average number of hospital visits and their awareness levels. In other words, as participants' awareness of green hospitals increased, the number of hospital visits per year decreased. These findings suggest that awareness of green hospitals may not only influence individuals' environmental sustainability consciousness but also their health management behaviors. The decrease in hospital visits could be related to increased health literacy, preventive approaches, and the development of individual health responsibility. This highlights the positive impact of environmental awareness on health behaviors. On the other hand, the narrow age range of the students, who are mostly young individuals, may have led to a lack of significant impact of age on awareness. In the study by Kılıç and Güdük (2018), it was reported that younger individuals had significantly higher green hospital awareness compared to older individuals. Another study conducted in Egypt with nursing students (Soliman et al., 2023) found that older students who participated in sustainability-related training had higher levels of knowledge and awareness.

In summary, the study concluded that Generation Z students have high awareness of sustainable (green) hospitals, but their knowledge levels are weak. In this context, it may be beneficial to organize educational programs, seminars, or practical projects to address the students' knowledge gaps. Adding elective courses on environmental sustainability themes to university curricula could be recommended. Additionally, awareness-raising campaigns and the use of digital media tools could enhance the students' knowledge levels. Future researchers working on this subject could be advised to conduct comparative studies with larger sample sizes, examining different age groups and professional fields.

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