

Araştırma Makalesi / Research Article



Hemşirelik Öğrencilerinin 21. Yüzyıl Becerileri ile Bakım Davranışları Arasındaki İlişki

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The Relationship Between Nursing Students' 21st Century Skills and Caring Behaviors

ÖZET

Hemşirelik öğrencileri, çağdaş sağlık hizmetlerinin zorluklarının üstesinden gelmek için yalnızca klinik yeterliliği değil, aynı zamanda uyum sağlama, eleştirel düşünme ve güçlü bir profesyonel kimlik duygusunu da kapsayan karmaşık bir dizi beceriye ihtiyaç duymaktadır. Modern sağlık hizmetleri, hemşirelerden geleneksel klinik uzmanlığın ötesine geçerek uyum sağlama, eleştirel düşünme ve derin bir profesyonel kimlik duygusunu da kapsayan çok yönlü bir beceri seti talep etmektedir. Özellikle hemşirelik öğrencileri, sürekli gelişen sağlık hizmetleri ortamının karmaşıklıklarında etkin bir şekilde yol alabilmek için bu yetkinlikleri geliştirmelidir. Hemşirelik öğrencilerinin 21. yüzyıl becerilerini edinmeleri ile klinik uygulamalarda özenli davranışlar sergilemeleri arasındaki ilişkiyi araştırmak. Bu çalışma, hemşirelik öğrencileri arasında 21. yüzyıl becerileri ve bakım verme davranışları arasındaki karmaşık ilişkiyi araştıran kesitsel bir tasarımıdır. Hemşirelik Öğrencilerinin Bakım Verme Davranışları Envanteri ve 21. Yüzyıl Becerileri ölçekleri ve alt boyut puan ortalamaları Bakım Verme Davranışları 5.01±0.68, alt boyut puan ortalamaları; Güvence (A): 5.06±0.69, Bilgi-beceri (KS): 4.85±0.74, Saygılı (S): 5.10±0.74, Bağlılık (B): 4.98±0.81,21 olarak bulunmuştur. Yüzyıl Becerileri ölçeğinin ortalama puanı 100,17±14,50 olup İletişim (İ), Eleştirel Düşünme (ED), Yaratıcılık (Y) ve İşbirliği (İ) alt boyutlarının ortalama puanları sırasıyla 29,47±4,46, 39,05±6,53, 19,57±3,52 ve 12,13±1,95'tir. Hemşirelik öğrencilerinin özenli davranışları ile 21. yüzyıl becerileri arasında önemli bir korelasyon olduğu ortaya çıkmıştır. Sonuçlar, bakım davranışlarının ve 21. yüzyıl becerilerinin geliştirilmesinin hemşirelik eğitim programlarına dahil edilmesinin ne kadar önemli olduğunu vurgulamaktadır. Eğitimciler, vaka çalışmaları, simülasyonlar ve probleme dayalı öğrenmeyi kullanarak öğrencilere bu becerileri geliştirme fırsatları verebilir.

Anahtar kelimeler: Bakım davranışları, Klinik Beceriler, 21. Yüzyıl Becerileri, Hemşirelik Öğrencileri, Mesleki gelişim


ABSTRACT

Nursing students require a complex set of skills to navigate the challenges of contemporary healthcare, encompassing not only clinical proficiency but also adaptability, critical thinking, and a strong sense of professional identity. Modern healthcare demands a multifaceted skill set from nurses, extending beyond traditional clinical expertise to encompass adaptability, critical thinking, and a profound sense of professional identity. Nursing students, in particular, must cultivate these competencies to effectively navigate the complexities of an ever-evolving healthcare landscape. This cross-sectional study explores the relationship between nursing students' of 21st century skills and their demonstration of caring behaviors in clinical practice. The mean scores of Nursing Students' Carering Behaviors Inventory and 21st Century Skills scales and sub-dimension scores Caring Behaviors was 5.01±0.68, and the mean scores of sub-dimensions; Assurance (A): 5.06±0.69, Knowledge-skill (KS): 4.85±0.74, Respectful (R): 5.10±0.74, Connectedness (C): 4.98±0.81.21. The mean score of the Century Skills scale was 100.17±14.50 and the mean scores of Communication (C), Critical Thinking (CT), Creativity (C) and Collaboration (CC) sub-dimensions were 29.47±4.46, 39.05±6.53, 19.57±3.52 and 12.13±1.95, respectively. It was discovered that there was a substantial correlation between nursing students' caring behaviors and their 21st-century skills. The results emphasize how crucial it is to include the development of caring behaviors and 21st-century skills into nursing education programs. Educators can give students opportunities to improve these skills by using case studies, simulations, and problem-based learning.

Keywords: Caring, Clinical Skills, 21st Century Skills, Nursing Students, Professional development

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INTRODUCTION

The nursing profession stands as a cornerstone of healthcare, demanding a unique blend of technical expertise and compassionate care (Allari et al., 2022). Nurses navigate an increasingly complex healthcare landscape, requiring them to master not only clinical skills but also a suite of competencies known as 21st-century skills (Porter-O'Grady et al., 2010). These skills, encompassing critical thinking, communication, collaboration, and creativity, are crucial for adapting to evolving patient needs and technological advancements (Nabizadeh-Gharghozar et al., 2020). Simultaneously, caring behaviors, which encompass empathy, compassion, and a commitment to patient well-being, remain central to the ethical and practical foundations of nursing (Fry, 2002). Nursing education faces the challenge of preparing graduates to meet these multifaceted demands, integrating both 21st-century skills and the traditional emphasis on caring. The interplay between these two domains is vital: strong 21st-century skills can enhance a nurse's ability to deliver effective and patient-centered care, while genuine caring can provide the motivation and ethical grounding for utilizing those skills responsibly. The need for improving nursing education to ensure safe and patient-centered care has been identified in a number of studies. (Sela et al., 2021; Öztürk and Okçin, 2025). Thus, exploring the relationship between nursing students' acquisition of 21st-century skills and their demonstration of caring behaviors is essential for informing curriculum development and pedagogical approaches in nursing education.

The 21st-century presents multifaceted challenges within healthcare, including an aging population, rising healthcare costs, and shortages of nursing staff (Fawaz et al., 2018). Equipping nursing students with the capabilities to face the increasing complexities of life and work in the 21st century is critical (Gulledge, 2012). The integration of 21st-century skills, often referred to as the "4Cs" – creativity, critical thinking, communication, and collaboration has become a focal point in educational reforms (Alphrazy & Octavia, 2023). Nursing education must evolve beyond

traditional models to cultivate these skills, preparing nurses to be proactive problem-solvers and adapt to rapid changes in healthcare practices (Zeydani et al., 2021). The ability to apply knowledge in novel situations, analyze complex data, and generate innovative solutions is of paramount for nurses working in dynamic clinical settings (Afandi et al., 2019). Effective communication skills, both interpersonally and through digital platforms, are necessary for coordinating care among diverse healthcare teams and engaging patients in shared decision-making (Siokal et al., 2023). Moreover, collaboration skills enable nurses to work effectively with colleagues from various disciplines, fostering a holistic approach to patient care. In fact, students are expected to have these skills in accordance with their field competencies (Alphrazy & Octavia, 2023).

Caring constitutes a fundamental tenet of the nursing profession, influencing patient outcomes, satisfaction, and the overall quality of healthcare delivery. Caring encompasses empathy for and connection with people (Fahrenwald et al., 2005). The essence of caring in nursing extends beyond the performance of clinical tasks; it involves establishing a therapeutic relationship with patients, recognizing their unique needs, and advocating for their well-being. Nurse educators play a crucial role in instilling caring values in students. They can foster a caring environment through role modeling, mentorship, and creating opportunities for students to reflect on their experiences (McEnroe-Petitte, 2011). Furthermore, curricula should integrate theories of caring, such as those developed by Swanson and Watson, to provide a framework for understanding and practicing caring behaviors. Reflection on caring experiences allows students to develop a deeper understanding of their own values and beliefs, contributing to the formation of a strong professional identity (Jaastad et al., 2022). In addition to clinical nursing activities, nurses express caring through compassion, concern, kindness, and interpersonal relationships (Alikari et al., 2022).

The convergence of 21st-century skills and caring behaviors represents a powerful synergy in nursing

practice (Krel et al., 2022). Nurses provide patient care that is driven by ideals of compassion, kindness, and empathy (Cole et al., 2022). Effective communication skills are vital for establishing trust and rapport with patients, enabling nurses to gather information, provide education, and advocate for their needs (Siokal et al., 2023). Critical thinking skills are essential for making sound clinical judgments that prioritize patient safety and well-being. Collaboration skills enhance the capacity to work effectively with interdisciplinary teams, ensuring coordinated and patient-centered care. Nurses can improve their problem-solving and critical thinking skills through reflective analysis, which helps them understand caring and develop empathy, ultimately improving their interactions with patients (Tseng et al., 2025). Creativity fosters innovation in care delivery, allowing nurses to develop tailored interventions that address individual patient needs and preferences. By integrating these skills, nurses can deliver care that is not only technically proficient but also deeply compassionate and patient-centered (Ross et al., 2014).

METHODS

Design

This study is a cross-sectional design. It was reported by following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies (von Elm et al., 2014)

Study Population and Sample

The population of the study consisted of second, third, and fourth year students in the nursing department of a state university in Turkey who had clinical practice experience in the 2024-2025 academic year. In this study, no sample selection was made from the population and all students were invited to participate. The data were obtained from a total of 130 students who voluntarily agreed to participate in the study, had

clinical practice experience, and completed the data form completely.

Data Collection

The 'Sociodemographic Data Form', 'Caring Behaviors Inventory-24' and '21st Century Skills Scale' were used to gather data online between April and June 2025.

Sociodemographic Data Form: The sociodemographic data form, designed based on a review of relevant literature (Dedemoğlu and Ceylan; 2025; Dedemoğlu et al., 2025; Erenoğlu et al., 2019; Dığın and Ozkan, 2021), comprised six questions about students' sociodemographic factors (age, gender, etc.) and their average academic performance.

The "Caring Behaviors Scale-24" (CBS-24) developed by Wu et al. (2006) is used to compare nurses' self-assessment and patient perceptions (Wu et al., 2006). The Turkish validity and reliability study of the scale was conducted by Kurşun and Kanan (2012) (3). The Caring Behaviors Scale includes Assurance (8 items=16,17,18,20,21,22,23,24), Knowledge-skill (5 items=9,10,11,12,15), Respectfulness (6 items=1,3,5,5,6,13,19) and Commitment (5 items=2,4,7,8, 14) and 24 items, and a 6-point Likert-type scale (1= never, 2= almost never, 3= sometimes, 4= usually, 5= most of the time, 6= always) is used for responses. When calculating the scale score, all items belonging to the scale and sub-dimensions are summed and divided by the number of items to obtain a scale score between 1 and 6. The higher the score obtained from the scale, the higher the perception of nursing care behavior (Kurşun & Kanan, 2012). For this study, the Cronbach's Alpha coefficient of "Caring Behaviors Scale-24" of nursing students was calculated as 0.957.

The “21st Century Skills” Scale was developed by Kelley et al. (2019) and the validity and reliability study of the scale in Turkish culture was conducted by Gür et al. (2023) (Kelley et al., 2019; Gür et al., 2023) The scale consists of 25 questions and 4 sub-factors. The questions are 5-point Likert-type, categorized from strongly disagree to strongly agree. The scale consists of critical thinking, communication, creativity and collaboration sub-dimensions. In the original version of the scale, Cronbach's alpha values in the sub-dimensions were stated as Collaboration, $\alpha=.826$; Communication, $\alpha=.749$; Creativity, $\alpha=.751$; and Critical Thinking, $\alpha=.876$ (Kelley et al., 2019). For this study, the Cronbach's Alpha coefficient of the scale was calculated as 0.964.

Ethical Considerations

Ethical approval for the study was obtained from the Ethics Committee of Burdur Mehmet Akif Ersoy University (GO 2025/1008). The goal of the study was explained to the participants, and their verbal agreement was obtained. The study was carried out in compliance with the Declaration of Helsinki's guiding principles.

Data analysis

Data analyses were conducted using IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA). Skewness and kurtosis coefficients, as well as Shapiro-Wilk and Kolmogorov-Smirnov tests were used to evaluate the conformity of the data to normal distribution. According to the findings, skewness and kurtosis values were not within the ± 2 limits recommended in the literature (Doğan, 2023; Schmidt, 2023; Akyüz & Gamgam, 2017). However, the significance level was found to be $p<0.05$ in both normality tests, indicating that the data were not normally distributed. Accordingly, the data analysis process was continued with nonparametric test methods.

Continuous variables were defined as arithmetic mean and standard deviation; categorical variables were defined as frequency and percentage values. The relationships between the scale scores were analyzed by Spearman correlation analysis. According to the descriptive characteristics of nursing students, the differences between the “Caring Behavior Scale” and “21st Century Skills Scale” scores were evaluated by Mann-Whitney U test for comparisons involving two groups and Kruskal-Wallis analysis of variance for comparisons involving more than two groups. In determining the suitability of the data set for regression analysis, correlations between variables were analyzed with VIF and tolerance values. A VIF value <10 and a tolerance value >0.1 were considered (Schreiber-Gregory, 2018; Senaviratna & Cooray, 2019). In all analyses, p values <0.05 were considered statistically significant.

RESULTS

The distribution of nursing students according to their descriptive characteristics is shown in Table 1. 75.4% of the students were female, 46.9% were in the first year, 42.3% were in the second year, and 76.9% of the sample consisted of students who expressed their academic achievement as moderate. 46.2% lived in the Mediterranean and 38.5% in the Aegean region. The mean age of the students was 20.09 ± 1.70 (years) and those with a GPA between 70-80 constituted 41.5% of the sample (Table 1).

The mean scores of Nursing Students' Caring Behaviors Inventory and 21st Century Skills scales and sub-dimension scores are shown in Table 2. Accordingly, the mean score of Caring Behaviors was 5.01 ± 0.68 , and the mean scores of sub-dimensions; Assurance (A): 5.06 ± 0.69 , Knowledge-skill (KS): 4.85 ± 0.74 , Respectful (R): 5.10 ± 0.74 , Connectedness (C): 4.98 ± 0.81 . 21. The mean score of the Century Skills scale was 100.17 ± 14.50 and the mean scores of Communication (C), Critical Thinking (CT), Creativity (C) and Collaboration (CC) sub-dimensions were

29.47±4.46, 39.05±6.53, 19.57±3.52 and 12.13±1.95, respectively (Table 2).

Table 1. Distribution of Nursing Students According to Descriptive Characteristics (n=130)

		Mean±SD	Min-Max
Age (year)		20.09±1.70	17-32
		n	%
Gender	Female	98	75.4
	Male	32	24.6
Class	2nd class	61	46.9
	3rd class	55	42.3
	4th class	14	10.8
Academic success	Low	12	9.2
	Medium	100	76.9
	High	18	13.8
Region of residence	Mediterranean -1	60	46.2
	Aegean -2	50	38.5
	Marmara-5	4	3.1
	Central Anatolia-6	3	2.3
	Eastern Anatolia-4	5	3.8
	Southeast Anatolia-3	8	6.2
GPA	50-60	11	8.5
	60-70	27	20.8
	70-80	54	41.5
	80-90	27	20.8
	90-100	11	8.5

GPA: Grade Point Average

Table 2. Nursing Students' Caring Behaviors and 21st Century Skills Scales and Subscale Mean Scores (n=130)

Scale	Sub-dimensions	X±SD	Min-Max
Caring Behaviors		5.01±0.68	1-6
	Assurance	5.06±0.69	1-6
	Knowledge and Skill	4.85±0.74	1-6
	Respectful	5.10±0.74	1-6
	Connectedness	4.98±0.81	1-6
21st Century Skills		100.17±14.50	26-125
	Communication	29.47±4.46	9-35
	Critical thinking	39.05±6.53	9-50
	Creativity	19.57±3.52	5-25
	Collaboration	12.13±1.95	3-15

CBI: Caring Behaviors Inventory

The correlations between the mean scores of nursing students' Caregiver Behaviors and 21st Century Skills scales and subscales are shown in Table 3. Accordingly, positive and statistically significant correlations were found between CBI and 21st

century skills (r: .527 p<0.001), communication (r: .556 p<0.001), critical thinking (r: .444 p<0.001), creativity (r: .441 p<0.001) and collaboration (r: .474, p<0.001). Positive and statistically significant correlations were found between assurance and 21st century skills (r: .520 p<0.001), communication (r: .543 p<0.001),

critical thinking (r: .442 p<0.001), creativity (r: .430 p<0.001) and collaboration (r: .474 p<0.001). There were positive and statistically significant correlations between knowledge-skills and 21st century skills (r: .518 p<0.001), communication (r: .532 p<0.001), critical thinking (r: .433 p<0.001), creativity (r: .444 p<0.001) and collaboration (r: .439 p<0.001). Positive and statistically significant correlations were found between respectfulness and 21st century skills (r: .417 p<0.001),

communication (r: .482 p<0.001), critical thinking (r: .374 p<0.001), creativity (r: .331 p<0.001) and collaboration (r: .368 p<0.001). Positive and statistically significant correlations were found between connectedness and 21st century skills (r: .416 p<0.001), communication (r: .452 p<0.001), critical thinking (r: .327 p<0.001), creativity (r: .353 p<0.001) and collaboration (r: .366 p<0.001) (Table 3).

Table 3. Correlations Between Nursing Students' Caring Behaviors and 21st Century Skills Scales and Subscales (n=130)

	CBI	Assurance	Knowledge and Skill	Respectful	Connectedness	21st Century Skills	Communication	Critical thinking	Creativity	Collaboration
CBI	-	.878***	.844***	.918***	.919***	.527***	.556***	.444***	.441**	.474***
Assurance		-	.667***	.735***	.704***	.520***	.543***	.442***	.430**	.474***
Knowledge and Skill			-	.685***	.730***	.518***	.532***	.433***	.444***	.439***
Respectful				-	.883***	.417***	.482***	.374**	.331*	.368**
Connectedness					-	.416***	.452***	.327**	.353**	.366**
21st Century Skills						-	.781***	.886***	.843***	.777***
Communication							-	.582***	.495***	.588***
Critical thinking								-	.756***	.607***
Creativity									-	.665***
Collaboration										-

CBI: Caring Behaviors Inventory, *p<0.05, **p<0.01, ***p<0.001.

The differences in the scores of the Caring Behaviors and 21st Century Skills scales in terms of the descriptive characteristics of nursing students are given in Table 4. Accordingly, it was found that there were significant differences between the scores of Critical thinking (p: .041) and Creativity (p: .019), which are sub-

dimensions of 21st Century Skills, in terms of gender. Critical thinking and Creativity scores of males were significantly higher than females (Table 4). No significant difference was found between the scores of both scales and sub-dimensions in

terms of the students' GPA and the region they lived in, and it is not indicated in the table.

It was determined that there were significant differences between 21st Century Skills (p: .009), Critical Thinking (p: .014) and Creativity (p: .001) scores in terms of students' grade levels. According to the results of the post-hoc analysis, it was seen that the difference stemmed from the mean scores of the 1st and 2nd grade students (1st Grade 21st Century Skills>3rd Grade 21st Century Skills, p: .002; 1st Grade ED>3rd Grade ED, p: .003; 1st Grade Y>3rd Grade Y; Dp: .003), (Table 4).

It was determined that there were significant differences between the scores of Collaboration (p: .005), one of the sub-dimensions of 21st Century Skills, in terms of students' academic achievement. According to the results of the post-hoc analysis, it was determined that the difference was between the groups indicating academic achievement as high and medium level (Academic achievement high level Collaboration>Academic achievement medium level Collaboration, P: .002), (Table 4).

Table 4. Differences in Scale Scores of Caring Behaviors and 21st Century Skills Scales in Terms of Descriptive Characteristics of Nursing Students (n=130)

		CBI X±SD	Assurance X±SD	Knowledge and Skill X±SD	Respectful X±SD	Connectedness X±SD	21st Century Skills X±SD	Communication X±SD	Critical thinking X±SD	Creativity X±SD	Collaboration X±SD
Gender	Female	4.98±.66	5.05±.69	4.81±.72	5.08±.72	4.94±.76	99.13±14.81	29.46±4.13	38.55±6.79	19.10±3.63	12.04±1.91
	Male	5.08±.77	5.10±.72	4.96±.81	5.16±.81	5.09±.85	103.31±13.20	29.50±5.41	40.59±5.51	20.81±3.09	12.40±2.06
Connectedness		U: 1361,00 p: .263	U: 1470,50 p: .597	U: 1382,50 p: .314	U: 1379,50 p: .307	U: 1322,50 p: .182	U: 1229,00 p: .078	U: 1448,00 p: .563	U: 1193,00 p: .041	U: 1140,00 p: .019	U: 1444,00 p: .486
Class	2nd class	5.04±.78	5.09±.77	4.90±.79	5.11±.85	5.02±.90	102.72±16.79 ^a	29.54±5.41	40.44±7.04 ^a	20.32±3.83 ^a	12.40±2.26
	3rd class	4.93±.58	4.97±.62	4.74±.68	5.05±.63	4.90±.70	97.11±11.46 ^b	29.44±3.39	37.49±5.66 ^b	18.54±3.20 ^b	11.70±1.55
	4th class	5.18±.62	5.27±.69	5.08±.72	5.21±.68	5.11±.81	100.85±12.75 ^c	29.28±3.70	39.14±6.53 ^c	19.85±3.00 ^c	12.57±1.60
Connectedness		KW: 3,635 p: .162	KW: 3,801 p: .150	KW: 4,298 p: .117	KW: 1,454 p: .483	KW: 2,543 p: .280	KW: 9,337 p: .009	KW: 1,575 p: .455	KW: 8,541 p: .014	KW: 9,258 p: .001	KW: 5,103 p: .078
Academic success	Low	5.05±.75	4.98±.83	4.83±.89	5.23±.77	5.10±.89	97.25±18.88	27.91±6.78	37.50±9.36	19.25±4.22	12.58±2.27 ^a
	Medium	4.98±.72	5.05±.73	4.81±.75	5.06±.77	4.95±.82	99.52±14.07	29.49±4.19	38.88±6.20	19.30±3.48	11.87±1.92 ^b
	High	5.15±.41	5.16±.38	5.10±.55	5.22±.55	5.10±.69	105.66±13.04	30.38±4.01	41.05±6.14	20.94±3.48	13.27±1.44 ^c
Connectedness		KW: .590	KW: .103 p: .950	KW: 1.655 p: .437	KW: 1.206 p: .547	KW: .894 p: .639	KW: 4,795 p: .091	KW: 1,669 p: .434	KW: 2,507 p: .285	KW: 3,306 p: .191	KW: 10,771 p: .005 c>b p: .002

CBI: Caring Behaviors Inventory, U: Man Whitney U, KW: Kruskal-wallis,

Results of Multiple Linear Regression Analysis on Caring Behaviors and 21st Century Skills in Nursing Students are presented in Table 5. Two models were found to be statistically significant. According to Model 1, it was found that the four independent variables consisting of Assurance, Knowledge-Skill, Respectfulness and Connectedness, which are the sub-dimensions of CBI, explained 17% of the

variance related to 21st century skills. According to Model 2; it was determined that four independent variables consisting of Communication, Collaboration, Creativity and Critical thinking, which are the sub-dimensions of the 21st Century skills scale, explained 18% of the variance related to care behaviors (Table 5).

Table 5. Results of Multiple Linear Regression Analysis on Caring Behaviors and 21st Century Skills in Nursing Students (n=130)

Dependent variable	Independent variables	β	SE	Beta	t	p	F/p	R ²	DW
Model-1 21st Century Skills	Güvence	3.426	3.197	.166	1.072	.286	6.433/ .000	.172	1.910
	Bilgi-beceri	6.167	2.756	.319	2.238	.027			
	Saygılı olma	-1.406	4.240	-.073	-.332	.741			
	Bağlılık	.270	3.834	.015	.070	.944			
Model-2 Caring Behaviors	İletişim	1.172	.406	.316	2.886	.005	6.567/.000	.180	1.805
	İşbirliği	.779	1.144	.092	.681	.497			
	Yaratıcılık	.023	.682	.005	.034	.973			
	Eleştirel düşünme	.123	.374	.049	.329	.743			

DISCUSSION

The goal of this study was to assess the correlation between caring behaviors and 21st-century skills among nursing students. The main finding was the detection of a substantial correlation between caring behaviors and 21st-century abilities. The findings indicated that students who had stronger 21st-century abilities also showed better caring behaviors. The study found a substantial correlation between caring behaviors and 21st-century skills, which emphasizes how crucial these skills are for nursing students (Hunter et al., 2013). Nurses must possess caring

behaviors, which include compassion, empathy, and respect for patients' dignity, as well as 21st-century skills like communication, critical thinking, collaboration, and creativity (Salimi et al., 2021). Nurses may deliver holistic and patient-centered care by combining these abilities (Kim & Sim, 2020; Zeydani et al., 2021). The findings highlight the necessity of incorporating the development of caring behaviors and 21st-century skills into nursing education programs. These abilities can be developed through simulations, case studies, and problem-based learning, which will enable students to apply their knowledge in practical settings (Hairida et al., 2021). Additionally, cultivating a supportive learning environment that values

reflection, collaboration, and lifelong learning can help students develop caring behaviors and 21st-century skills (Fikre et al., 2022).

The study's findings are consistent with earlier studies that have emphasized the significance of caring behaviors in nursing practice (Allari et al., 2022; Karimi et al., 2017; Wong, 2025; Erenoğlu et al., 2019; Dığın and Ozkan, 2021). However, this study contributes to the literature demonstrating the relationship between these behaviors and 21st-century skills. This shows that in order to give patients the best possible treatment, nurses must possess a combination of caring behaviors and 21st-century skills. Several studies emphasize the importance of communication skills in the nursing profession, indicating that efficient communication fosters holistic care (Eka et al., 2023; Janthon et al., 2015). Nurses depend on effective communication to establish rapport with patients, comprehend their requirements, and offer efficient emotional support. Furthermore, efficient communication is essential for interprofessional collaboration, which guarantees coordinated and comprehensive patient care (Fry, 2002).

Numerous studies have demonstrated the value of critical thinking in nursing practice, which is consistent with the results of the current study. Nurses must possess strong critical thinking abilities in order to evaluate complicated clinical situations, make defensible judgments, and provide patients with safe and efficient care (Jean-Baptiste & Asongwed, 2020; Profetto-McGrath et al., 2003; Shin et al., 2023; Zeydani et al., 2021). Nurses can improve patient outcomes and advance evidence-based practice by using critical thinking techniques. Furthermore, the results emphasized the significance of teamwork in nursing, which is in line with earlier studies that emphasized how crucial collaboration is to provide high-quality patient care (D'Souza et al., 2013). Nurses frequently work in interdisciplinary teams to provide comprehensive care. Effective communication, mutual respect, and shared decision-making are essential for fostering effective teamwork and optimizing patient outcomes (Isidori et al., 2022).

It is essential for nurses to be able to communicate effectively to meet patients' communication needs, and having strong communication skills is a vital component of patient care (O'Hagan et al., 2013). Nurses need strong communication skills so that they can lead effectively, motivate their teams, and stand up for their patients (McKillen, 2024). Nurses can build strong relationships with patients and their families by treating them with respect in a fast-paced environment, allaying their fears and concerns, and making sure they understand they understand the communication flow and content (Kourkouta & Papathanasiou, 2014). Open and honest communication helps all parties develop trust, which in turn improves the therapeutic relationship and makes patients more willing to actively participate in their own care (Ardakani et al., 2019). Communication is an essential part of nursing because nurses spend a large amount of time with patients and frequently try to establish a professional relationship (Mbambe & Maniam, 2018). Nurses can evaluate a patient's situation and problems by actively listening, which raises their self-esteem and incorporates the nursing diagnosis and care plan at all levels (Kourkouta & Papathanasiou, 2014). Therefore, communication, which encompasses both sending and receiving messages and interpreting their meaning, is the essence of human relationships and patient care in nursing (Campos & Graveto, 2009). Nurses must be able to communicate effectively with patients, families, and other healthcare professionals to deliver high-quality care and ensure patient safety (Hermann et al., 2019; Noviyanti et al., 2021).

LIMITATIONS

The sample size, although adequate, may not be fully representative of the broader population of nursing students, potentially limiting the generalizability of the findings.

CONCLUSION

It was discovered that there was a substantial correlation between nursing students' caring behaviors and their 21st-century skills. The results emphasize how crucial it is to include the development of caring behaviors and 21st-century skills into nursing education programs. Educators can give students opportunities to improve these skills by using case studies, simulations, and problem-based learning.

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