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The implicit and explicit attitudes of nursing students in Türkiye towards transgender individuals

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Abstract

Background The study aimed to investigate the implicit and explicit attitudes of nursing students in Türkiye towards transgender individuals, as such attitudes play a critical role in shaping the quality and inclusivity of healthcare services for gender-diverse populations.

Methods A descriptive cross-sectional design was employed. Data were collected from 344 undergraduate nursing students. Implicit attitudes were assessed using the Implicit Association Test (IAT; range: −2 to +2), while explicit attitudes were measured with the Attitudes Toward Transgendered Individuals Scale (ATTI; range: 20 to 100, with higher scores indicating more positive attitudes).

Results Students showed moderately positive explicit attitudes (M = 60.48) and slightly negative implicit attitudes (M = 0.19) toward transgender individuals. No significant correlation was found between the explicit and implicit attitudes. Explicit attitudes were more positive among women, those born in Türkiye, students living in metropolitan areas, and those with transgender friends or prior training on transgender health. Religious commitment was negatively associated with explicit attitudes.Stepwise regression analysis model including having a transgender friend, being born in Türkiye, religious commitment, woman gender, and living in a metropolitan area explained 30.6% of the variance in explicit attitudes.

Conclusions These findings highlight the attitudinal patterns of nursing students and emphasize the need to integrate comprehensive LGBTQ + content into nursing education to promote inclusive healthcare services. Doing so may foster more inclusive attitudes and reduce potential disparities in the care of transgender individuals.

Clinical trial number Not applicable.

Keywords Nursing students, Implicit attitudes, Explicit attitudes, Transgender individuals

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Background

The gender identity of transgender individuals is not aligned with their assigned sex at birth [1]. Trans men are defined as those assigned female at birth but who identify as male, while trans women are assigned male at birth but identify as female [2]. These definitions are crucial for understanding trans-specific healthcare needs but are insufficient. Transgender individuals face numerous challenges in healthcare settings that significantly impact their access to and quality of care [3, 4]. These challenges may stem from systemic barriers, provider biases, and a lack of understanding regarding transgender health needs [3]. Transgender individuals express their concerns regarding the lack of knowledge among healthcare professionals, the lengthy and complex gender reassignment process, and the high cost of hormone therapy. They also emphasized the importance of being able to use their preferred names in healthcare institutions prior to obtaining updated identification card [4]. These barriers not only hinder access to care but also contribute to the marginalization and unmet health needs of transgender people [3, 4]. Transgender individuals have unique health needs, and it is essential to determine the explicit and implicit attitudes of nursing students who are future nurses.

Nursing is a healthcare profession that has to provide a holistic approach to all patients. Nurses' attitudes towards transgender individuals are critical in shaping the quality of care provided in healthcare settings. These attitudes can be categorized into explicit and implicit attitudes, both of which significantly influence the interactions between nurses and transgender patients [5]. Explicit attitudes are consciously recognized and reported stereotypes, beliefs, and perceptions [6]. Also, attitudes can be implicit, operating under the unconscious self, often contradictory to explicitly held beliefs [7]. Implicit attitudes shape behavior and attitudes through the automatic, rapid integration of social patterns, allowing individuals to respond instinctively in unfamiliar or potentially threatening situations. However, these biases can also increase the risk of discrimination and unequal treatment [8]. Nurses' implicit attitudes can lead to having insufficient time with patients and inadequate care and treatment [9]. Little is known about nurses' implicit biases and subsequent effects on patient care in this population [6]. A study has shown that nurses have slight biases and explicit preference for cisgender individuals [10].

Understanding nursing students' attitudes is essential to identifying and addressing potential biases leading to discriminatory practices in clinical settings. There are a few studies addressing nursing students. A study addressing the implicit and explicit attitudes toward gay men and lesbian women among nursing and psychology students indicated that both groups had negative implicit attitudes toward sexual minorities. In contrast, nursing students reported more negative explicit attitudes than psychology students [11]. An integrative review investigation of the Nursing Students' Attitudes Toward Lesbian, Gay, Bisexual, and Transgender showed that less than 50% of the studies suggested positive learning attitudes of nursing students toward LGBT persons, whereas the others reported negative or neutral. The same review has indicated that there is a trend to positive leaning. However, studies before the 2000s reported that negative attitudes were predominant [12]. There is a study conducted in an educational setting indicates that nursing students who engage in educational interventions, such as virtual patient simulations, demonstrate improved attitudes toward transgender care, highlighting the importance of experiential learning in shaping perceptions [13, 14]. This suggests that nursing students can provide more compassionate and competent care by recognizing and addressing their own attitudes. However, addressing the problem of discrimination and defining the problem before the intervention must come first. Thus, coping with this bias during student time is necessary. Although there are studies investigating the attitudes of nursing students toward LGBT individuals [15–18] there is no study investigating implicit and explicit attitudes among student nurses focusing solely on transgender individuals in Türkiye. The study aimed to investigate the implicit and explicit attitudes of nursing students towards transgender individuals.

Method

Participants

Participants were undergraduate nursing students enrolled in a nursing program in İstanbul, Türkiye. Despite accessing the study link to 344 students, 146 did not complete the Implicit Association Test (IAT) due to technical issues (unable to launch the test page) or incomplete tests. The 344 students were analyzed in terms of the ATTI Scale and Sociodemographic forms, and those 198 were analyzed for IAT-Transgender version.

Instruments

Sociodemographic information form

This form included 16 items regarding participants' age, marital status, gender, sexual orientation, religion, religious commitment, country of birth, place of residence, household structure, parental education level, family income, the presence of a transgender friend or family member, and prior education on transgender health in their nursing curriculum.

Attitudes toward transgendered individuals scale (ATTI)

Originally developed by Walch et al. and adapted to Turkish by Akdemir and Gölge [19], this 20-item, 5-point

Likert scale assesses explicit attitudes toward transgender individuals. Scores range from 20 to 100, with higher scores indicating more positive attitudes. Reverse scoring is applied to items 1, 5, 8, 10, 12, 13, 14, 16, and 17. The Cronbach's alpha coefficient in the current study was 0.94.

Implicit association test (IAT) – transgender version

The IAT, developed by Greenwald et al. [20] and adapted for transgender topics, is a web-based task measuring implicit biases. Participants categorize images of transgender and cisgender individuals alongside positive and negative words (Fig. 1 shows the sample page). The D-score obtained reflects implicit preferences. Positive D-scores indicate a bias toward cisgender individuals; negative scores indicate a bias toward transgender individuals. Interpretation of D-scores: $D \leq -0.65$: strong preference for non-conforming pairings / $-0.65 < D \leq -0.35$: moderate preference/ $-0.35 < D \leq -0.15$: slight preference /$-0.15 \leq D \leq 0.15$: no preference / $0.15 < D \leq 0.35$: slight preference for conforming pairings/ $0.35 < D \leq 0.65$: moderate preference/ $D \geq 0.65$: strong preference.

Procedure

Students were recruited through convenience sampling and invited to participate via an online survey link. The decision to employ online recruitment was made to enhance accessibility for students across different universities, facilitate participation, and safeguard anonymity and confidentiality. Conducting the study online also helped to minimize potential social desirability bias by enabling participants to respond in a private setting. Furthermore, participants were required to download the Inquisit web application to their mobile phones in order to complete the IAT, which further highlighted the appropriateness of conducting data collection in an online format. Participation involved two stages:

(1) Completion of the Sociodemographic Information Form and the ATTI Scale via an online form.
(2) Downloading the Inquisit Web application through Google Play or App Store to complete the Transgender IAT.

After receiving instructions, students first completed the survey, then were directed to the IAT via the app.



Fig. 1 The picture was created leveraging ChatGPT due to copyright of IAT Test

Ethical consideration

The study was conducted using the ethical principles outlined in the Declaration of Helsinki. Before data collection, ethical approval was obtained from the Koç University Committee on Human Research (Approval No: 2024.417.IRB3.179). Informed consent was obtained from all students. In order to impede selection bias, several measures were taken to ensure voluntary participation. Although some participants were recruited from the same university where the researchers are affiliated, participation was entirely anonymous, no identifying information was collected, and students were informed that their decision to participate would have no impact on their academic standing or relationship with faculty members.

Statistical analysis

All analyses were conducted using IBM SPSS Statistics (Version 28.0). Descriptive statistics (mean, standard deviation, frequencies, and percentages) were used to summarize the participants' sociodemographic characteristics and scale scores. Group comparisons were performed using independent samples t-tests or one-way ANOVA for normally distributed variables, and Mann–Whitney U or Kruskal–Wallis tests for non-normally distributed variables. Post hoc analyses were conducted using Tukey's HSD test where appropriate. Correlations between ATTI scores, D-scores, and religious commitment were analysed using Pearson correlation analysis. To identify significant predictors of attitudes toward transgender individuals (ATTI scores), a multivariate stepwise linear regression analysis was conducted. Model fit and explained variance were assessed using adjusted R^2 and p-values. A significance level of $p < .05$ was considered statistically significant.

Results

The study sample consisted of 344 participants ($n = 344$), with 198 completing all instruments and 146 unable to complete the IAT due to technical issues or incomplete tests. The mean age was 20.65 ± 0.13 years, with 85.5%

female and 14.5% male. Female participants had a significantly higher mean ATTI score (61.47 ± 14.79) compared to males (54.64 ± 18.46) ($p = .01$). In terms of sexual orientation, the majority (93.9%) identified as heterosexual, with no significant differences in ATTI scores ($p = .17$). Regarding income, 26.7% reported income less than expenses, 61.3% equal, and 11.9% more; no significant differences in ATTI scores were found ($p = .263$).

Geographically, 73% of participants were born in Türkiye, with those born in Türkiye having significantly higher ATTI scores ($p = .007$). Regionally, participants living in metropolises had significantly higher ATTI scores than those in other areas ($p < .001$). Family structure also influenced ATTI scores, with those in nuclear families scoring significantly higher ($p < .001$). There were no significant differences in ATTI scores based on maternal ($p = .119$) or paternal education levels ($p = .23$).

Regarding personal connections, 16.9% of participants had a transgender friend, and 4.4% had received training on trans-specific health. Those who were partly trained and had transgender friends had significantly higher ATTI scores ($p = .004$). Grade level also showed significant differences in ATTI scores, with first-year students having the lowest scores ($p < .001$). There were no significant differences found in variables regarding D-scores ($p > .05$) (Table 1).

As shown in Table 2, while ATTI scores of participants ($n = 344$) were found to be 60.48 (SD = 15.53), indicating moderately positive explicit attitudes, D-scores ($n = 198$) were found to be 0.19, indicating slightly negative implicit attitudes toward transgender individuals.

A significant moderate negative association was found between ATTI scores and religious commitment ($p < .001$). There was no significant association between D-scores and religious commitment (Table 3).

As shown in Table 4, stepwise regression analysis was used to determine the predictability of the ATTI score using variables found to be statistically significant in the univariate analysis. Independent variables were coded as dummy variables. All models were found to be significant ($p < .05$). Having a transgender friend predicted 13.9% (B = 0.252) of the variance in the first model. Being born in Türkiye added a 7.7% contribution (B = 0.224); religious commitment added a further 5.4% (B = –0.256); being a woman contributed 2.6% (B = 0.165); and living in a metropolis added 1.1% (B = 0.108) to the final model. The overall model explained 30.6% of the variance (R^2 = 0.306).

Discussion

This study examined nursing students' explicit and implicit attitudes towards transgender individuals. It drew attention to the important roles they will assume in the future as healthcare professionals. The results of the study shed light on various factors affecting nursing students' attitudes toward transgender individuals.

According to the results of the present study, the attitudes of first-year nursing students toward transgender individuals were found to be more negative than those of students in other grades. The results of a study examining implicit and explicit attitudes towards gay men and lesbian women among undergraduate and graduate students in nursing and psychology departments reported that among nursing students, undergraduate students had more negative explicit attitudes towards gay men and lesbian women than graduate students [11]. This study result is aligned with our study. Another study [21] examining the knowledge and willingness of undergraduate, graduate, and RN-BSN nursing students to provide care and comfort to transgender patients reported that a higher level of education positively associated with willingness to provide such care, such as shown in our results. In contrast, a study comparing transphobia in students and health professionals reported that education level was not a significant variable [22]. This difference can be explained by the fact that the participants in the sample group are in different age ranges and have received education in different occupational groups. It has been stated that transgender individuals face disproportionate difficulties in accessing health services and are often subjected to poor medical treatment and that one of the main reasons for this situation is the insufficient level of knowledge and awareness of healthcare providers [23]. Based on the results of this study, it can be stated that the negative attitudes of nursing students towards transgender individuals can be decreased with the getting trans-spesific knowledge. With the progress of trans-specific knowledge, students' awareness of ethical principles and patient rights will increase, positively affecting their attitudes.

Our study results showed that female students had more positive attitudes towards transgender individuals compared to male students. The study result is consistent with the literature. Female healthcare professionals were less transphobic than male counterparts [24]. Similarly, in another study conducted among health professionals, including nursing students, it was determined that men had more negative attitudes towards transgender individuals compared to women [22]. A study conducted in Türkiye with 449 nurses showed that male nurses had higher levels of homophobia [25]. Another study measuring the attitudes of nursing students toward LGBT individuals in Türkiye, it was stated that male students had more negative attitudes toward LGBT individuals than female students [26]. Similarly, a study conducted with 824 nurses in Italy found that female nurses had more positive attitudes than male nurses [27]. In light of these findings, it can be said that gender is an important determinant of

Table 1 Distribution of the ATTI and D-scores of participants

Variables					
		N	**Mean (± SD)**	***N***	**Mean (± SD)**
Age		344	20, 65 (0,13)	198	20,71 (0,17)
Religious commitment		344	6,68 (0,12)	198	6,55 (0,15)
Gender		**N (%)**	**ATTI Mean (SD)**	**N (%)**	**D-scores Mean (SD)**
	Woman	294 (85,5)	61,47 (14,79)	171 (86,4)	0,18 (,45)
	Man	50 (14,5)	54,64 (18,46)	27 (13,6)	0.22(,35)
	Test value	T = 2,486		T=-,409	
	p	**0,01****		0,160	
Sexual orientation	Heterosexual[a]	323 (93,9)	59,86 (14,86)	178 (89,9)	0,20 (0,43)
	Lesbian [ab]	3 (0,9)	77,00 (37,26)	7 (3,5)	0,00 (0,36)
	Gay [abc]	4 (1,2)	80,75 (23,79)	3 (1,5)	0,27 (0,30)
	Bisexual [bcd]	5 (1,5)	80,40 (15,77)	3 (1,5)	0,40 (0,26)
	Asexual [abcd]	9 (2,6)	57,22 (14,05)	3 (1,5)	0,10 (0,39)
	Do not want to specify	-		4 (2,0)	-0,30 (0,73)
	Test value	H = 12,11		F = 0,178	
	p	**0,17**		1,54	
Income level	Income less than expenses	92 (26,7)	62,75 (18,61)	52 (26,3)	0,11 (0,45)
	Income equal to expenses	211 (61,3)	59,63 (13,95)	123 (62,1)	0,21 (0,43)
	Income more than expenses	41 (11,9)	59,75 (15,61)	23 (11,6)	0,26 (0,39)
	Test value	F = 1,341		F = 1,353	
	p	,263		0,261	
County of birth	Türkiye	251 (73)	63,71 (15,77)	153 (77,3)	0,19 (0,39)
	Other	93 (27)	51,75 (10,88)	45 (22,7)	0,18 (0.55)
	Test value		T = 7,950	T = 0,19	
	p		**0.007**	0,16	
Living area	Metropol[a]	86 (25)	66,15 (16,06)	59 (29,8)	0,24 (0,41)
	Province[ab]	114 (33,1)	61,47 (16,03)	63 (31,8)	0,17 (0,42)
	Town[bc]	108 (31,4)	57,78 (14,18)	60 (30,3)	0,17 (0,45)
	Village[c]	36 (10,5)	51,88 (10,64)	16 (8,1)	0.11 (0.51)
	Test value	F = 9,360		F = 0,54	
	p	**<,001**		0,65	
Type of family	Nuclear[a]	251 (73)	62,33 (15,42)	148 (74,7)	0,22 (0,39)
	Extended[b]	74 (21,5)	54,06 (13,55)	39 (19,7)	0,10(0,51)
	Broken[ab]	19 (5,5)	60,94 (18,26)	11 (5,6)	0,09 (0,61)
	Test value	F = 8,456		F = 1,505	
	p	**<,001**		0,53	
Education level of mother	Non-literacy	19 (5,5)	58,42 (13,99)	12 (6,1)	-0,01 (0,63)
	Primary school	100 (29,1)	62,93 (15,05)	59 (29,8)	,19 (0,38)
	Secondary school	55 (16)	62,93 (14,55)	35 (17,7)	,15 (0,36)
	High school	116 (33,7)	58,70 (16,22)	65 (32,8)	,24 (0,45)
	Graduate /postgraduate	54 (15,7)	57,88 (15, 90)	27 (13,6)	,20 (0,48)
	Test value	F = 1,848		F = 0,993	
	p	,119		0,41	
Education level of father	Non-literacy	5 (1,5)	59,00 (7,10)	2 (1)	-,47 (1,16)
	Primary school	77 (22,4)	63,84 (15,61)	46 (23,2)	,20 (0,36)
	Secondary school	58 (16,9)	59,39 (12,26)	37 (18,7)	,19 (0,38)
	High school	136 (39,5)	60,27 (16.12)	73 (36,9)	,18 (0,48)
	Graduate /postgraduate	68 (19,8)	58,13 (16.89)	40 (20,2)	,21 (0,42)
	Test value	F = 1,384		F = 1,205	
	p	,23		0,31	

Table 1 (continued)

Transgender family member	Yes	9 (2,6)	66,11 (10,37)	5 (2,5)	-,029 (0,46)
	No	335 (97,4)	60,33 (15,63)	193 (97,5)	,19 (0,43)
	Test value	T = 1,623		T=-1,153	
	p	0,3		0,78	
Transgender friend	Yes	58 (16,9)	73,32 (15,22)	36 (18,2)	0,15 (0,39)
	No	286 (83,1)	57,87 (14,27)	162 (81,8)	0,20 (0,44)
	Test value	T = 7,119		T=-68	
	p	**<,001**		0,5	
Training transgender health	Yes[ab]	15 (4,4)	64,20 (14,77)	9 (4,5)	0,17 (0,50)
	No[b]	286 (83,1)	59,26 (15,39)	169 (85,4)	0,18 (0,44)
	Partly[a]	43 (12,5)	67,30 (15,11)	20 (10,1)	0,28 (0,35)
	Test value	F = 5,598		F = 0,47	
	p	**,004**		0,62	
Grade	1[a]	178 (51,8)	54,91 (13,02)	104 (52,5)	,19
	2[b]	79 (23)	65,00 (16,24)	40 (20,2)	,21
	3[b]	32 (9,3)	65,25 (16,50)	24 (12,1)	,08
	4[b]	55 (16)	69,23 (14,71)	30 (15,2)	,24
	Test value	F = 19,33		F = 0,69	
	p	**<,001**		0,55	

Tukey a-d: There is no difference between the variables with same letters. Anova and T-test were performed for those that were normally distributed, and Kruskal Wallis and Mann Withney u tests were performed for those that were not. Tukey test was used as a post hoc analysis for significant variables

Table 2 Mean scores of the ATTI scales and D-scores

Scales	*N*	Mean (SD)	Min/Max
ATTI	344	60,48 (15,53)	24 /100
D-scores	198	0,19 (0,43)	-1,29/ 1,46

Table 3 Correlation between the ATTI, D-scores and religious commitment

Variables	Religious commitment	
ATTI (*N* = 344)	*r*	-,370
	p	**< 0.001**
D-scores (*N* = 198)	*r*	,00
	p	1

attitudes towards transgender individuals, and women generally exhibit more inclusive and positive attitudes than men.

On the other hand, the implicit attitudes of nursing students did not differ based on the demographics. This finding suggests that broader cultural and social norms may shape implicit attitudes more than individual demographic characteristics. The absence of demographic effects may also reflect the relative homogeneity of the sample, as participants were all nursing students who shared similar educational and institutional contexts. Moreover, the high attrition rate in the IAT may have limited statistical power to detect subtle differences. Taken together, these findings suggest that implicit attitudes toward transgender individuals may be less sensitive to individual-level demographic characteristics and instead reflect pervasive societal stereotypes.

The present study found a moderate negative relationship between ATTI scores and religious commitment. This finding is in line with other studies showing that religion can be one predictor of the attitudes of students and health professionals toward LGBT individuals [25, 28, 29]. Nursing students who expressed themselves as atheists showed more positive attitudes towards transgenders [29]. It has been shown that commitment to any religion, regardless of religion, is associated with negative attitudes towards LGBT. These findings suggest that religion may have an effect on individuals' attitudes towards LGBT individuals and that this effect is an important factor that should be addressed to develop more inclusive and positive attitudes.

It was determined that students who have transgender friends showed more positive attitudes than students without transgender friends in the current study. In the literature, it has been found that people who know a transgender person exhibit more positive attitudes than those who do not [22, 24, 30]. It can be interpreted that people who know transgender individuals tend to demonstrate more empathy towards transgender people, which leads to more positive attitudes. A study in the literature shows that individuals have less negative attitudes towards trans individuals they find close to them [22].

The findings of this study underscore the pivotal role of both personal and educational experiences in shaping attitudes toward transgender individuals. Participants who reported having a transgender friend or receiving at least partial training in trans-specific health demonstrated statistically more favorable attitudes, as evidenced by higher ATTI scores. This result is consistent with previous research indicating that interpersonal contact and targeted educational interventions effectively

Table 4 Multivariate stepwise analysis of predictors for ATTI score

	Model	Unstandardized coefficients		Standardized coefficients	t	Sig*	Adjusted R^2	*R* Square Change
		B	Std. error	Beta				
1	(Constant)	57,878	,854		67,780	<,001	,139	,139
	Having friend	15,450	2,080	,373	7,429	<,001		
	(Constant)	51,040	1,435		35,567	<,001		
2	Having friend	13,262	2,023	,320	6,557	<,001		
	Born in Türkiye	9,877	1,705	,283	5,793	<,001	,216	,077
	(Constant)	63,572	2,866		22,180	<,001		
3	Having friend	10,622	2,025	,256	5,245	<,001		
	Born in Türkiye	8,513	1,671	,244	5,096	<,001		
	Religious commintment	-1,660	,332	-,245	-4,997	<,001	,270	,054
	(Constant)	58,007	3,228		17,967	<,001		
	Having friend	10,622	1,992	,256	5,332	<,001		
4	Born in Türkiye	8,955	1,648	,256	5,434	<,001		
	Religious commitment	-1,730	,327	-,255	-5,283	<,001		
	Woman gender	6,816	1,928	,162	3,536	<,001	,296	,026
	(Constant)	57,810	3,210		18,009	<,001		
	Having friend	10,426	1,982	,252	5,261	<,001		
5	Born in Türkiye	7,835	1,711	,224	4,580	<,001		
	Religious commitment	-1,733	,325	-,256	-5,326	<,001	,306	,011
	Woman gender	6,936	1,917	,165	3,619	<,001		
	Live in metropol	3,874	1,708	,108	2,268	,024		

Dependent Variable: ATTI / Significant at the $p < .05$

reduce stigma and foster inclusivity in healthcare environments [12, 25, 26]. Consequently, integrating structured educational modules on transgender health into nursing curricula, along with opportunities for meaningful engagement with transgender communities, may enhance nursing students' cultural competence and contribute to greater health equity and improved care quality for transgender individuals.

It is important to determine the explicit and implicit attitudes of nursing students, who will have critical importance among health professionals, towards transgender individuals in order for patients to receive equal care. Nurses' attitudes may cause them to spend less time with patients and decrease the quality of care [9]. A comparative analysis was conducted using data from Project Implicit to evaluate healthcare professionals' results on the Implicit Association Test (IAT) for Sexuality [31]. This particular IAT assesses participants' attitudes toward heterosexuals in comparison to lesbian and gay individuals. The study examined various groups, including physicians, other diagnostic and treatment providers, nurses, mental health professionals, and non-healthcare providers. Among the four healthcare provider groups, nurses demonstrated the strongest implicit bias favoring heterosexuals over lesbian and gay individuals. When the results of studies on the attitudes of nurses and healthcare professionals towards LGBTQ individuals are examined, both positive and negative perspectives were found [3, 11, 22, 32]. Relatively few of these studies have focused specifically on nursing students, and most have focused on explicit rather than implicit attitudes [5, 6, 11, 12]. There may be reasons individuals are not aware of their explicit attitudes. Therefore, the literature emphasizes the associations between explicit and implicit attitudes [11, 33, 34]. However, our results revealed that while nursing students reported positive explicit attitudes toward transgender individuals, their implicit attitudes were negative, favoring cisgender individuals.There might be several reasons for this outcome. First, the disassociation can be interpreted as an indication of social desirability bias, whereby students consciously express favorable views toward transgender people in explicit measures while their underlying implicit associations remain biased in favor of cisgender individuals. The fact that the implicit association test setting, which enables students to use nicknames while participating in the study, might impede the pressure of social desirability, which caused the unbiased outcomes. On the other hand, explicit attitudes were measured by a self-report instrument, which is particularly vulnerable to social desirability bias, as participants may consciously report more favorable attitudes toward transgender individuals, especially considering the sensitivity of issues related to gender identity. The disassociation between explicit and implicit attitudes observed in this study is consistent with theoretical frameworks and prior research highlighting the dual nature of human attitudes. According to the Dual Attitude Model [35] and the MODE model [36], individuals may simultaneously hold

consciously controlled explicit attitudes and automatic implicit associations that do not align. This divergence tends to be particularly pronounced in socially sensitive domains, such as gender identity, where participants may feel pressure to report favorable views while their implicit measures continue to reveal underlying biases. Second, it can be interpreted by the class and average age of the students included in our study sample. More than half of the students participating in the study were first-year students. There may not have been a difference between implicit and explicit attitudes because students have not yet had the process of giving care and forming prejudices in clinical practice. On the other hand, instruments such as the Implicit Association Test (IAT) used to measure implicit attitudes may yield different results depending on the participants' context or attention level. A weak and negative correlation between implicit and explicit attitudes of undergraduate nursing students has been reported in the literature [11]. In another study, it was reported that the implicit attitudes of nurses were more negative [5].

As future nurses, students should adopt ethical and professional principles to provide inclusive care for all patients with dignity and respect. One of these is justice. Justice in nursing is important in providing healthcare to patients fairly and observing individual rights [37–39]. Among the ethical principles in the Code of Ethics of the American Nurses Association, the statement that "the nurse is obliged to act with compassion and respect the dignity and autonomy of each patient" draws attention [40]. Another important concept is patient advocacy. Advocacy roles undertaken by nurses are of great importance in protecting patients as well as enabling safe practices in healthcare settings [41, 42]. However, for nurses to apply these critical concepts in patient care, they must be able to provide care without discrimination (without prejudices) between patients, as stated in the nursing oath (Nightingale Pledge). In addition to revealing the explicit and implicit attitudes of nursing students towards transgender individuals, this study is also important for nursing students to recognize their prejudices. When nurses and nursing students recognize their prejudices and increase their knowledge about transgender people, they can be inclusive for all patients [43]. Recognizing our prejudices is the first step to ensuring inclusive care with human dignity.

This study revealed the explicit and implicit attitudes of nursing students, who are future health professionals, towards transgender individuals from the perspective of influencing factors. It has been stated that negative attitudes of health professionals can negatively affect the treatment and care of LGBT individuals [12]. However, it is reported in the literature that LGBT individuals face difficulties in health institutions, do not receive the services they deserve, and are subject to neglect and discrimination [3]. In addition, health professionals and students state that they do not have sufficient information about LGBT individuals [26, 29, 44, 45]. The fact that caregivers have sufficient knowledge and skills to meet the needs of LGBT individuals forms the basis of inclusive care. It is also emphasized that issues regarding the health needs of LGBT individuals should be included in the curricula of nursing programs and in-service training programs in health institutions [12, 25, 26]. It is emphasized that incorporating training related to LGBT individuals into the nursing curriculum, organizing panels and conferences to promote student interaction with these individuals, and including courses on professional ethics can enhance nursing students' awareness and competencies regarding LGBT-related care [44]. In this context, adopting a comprehensive approach to the healthcare needs of LGBT individuals in nursing education will form the foundation for providing more equitable and inclusive healthcare services. Especially trans individuals need more comprehensive care due to gender affirming surgery and knowledge is essential fort his area to provide a holistic care. It is thought that the results of the study will be guiding for both nursing curriculum organizers and policymakers.

Limitations

This study has several limitations. Firstly, the overrepresentation of first-year students may limit the generalizability of findings. Secondly, a 42.4% attrition rate in the app-based Implicit Association Test (IAT), primarily due to technical difficulties rather than participant refusal, resulted in incomplete data. This non-random attrition may have introduced bias and affected the internal validity of the implicit attitude results. In addition, the IAT outcomes may have been influenced by contextual factors such as attention or device-related distractions. Third, the cross-sectional design limits the ability to draw causal conclusions or assess changes over time.

Conclusion

This study highlights the explicit and implicit attitudes of nursing students towards transgender individuals, emphasizing the critical role they will play as future healthcare professionals. The findings reveal that factors such as education level, gender, religious commitment, and personal relationships with transgender individuals significantly influence students' attitudes. Negative implicit and explicit attitudes towards transgender people are a barrier to the successful implementation of adequate trans-inclusive care within healthcare settings, particularly concerning nurses. Appropriate education for nurses about transgender healthcare issues should

include attempts to address the conflation of sex and gender and persistent attitudinal barriers.

Abbreviations

ATTI Attitudes Toward Transgendered Individuals
IAT Implicit Association Test

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Assist. Prof. Seda Karakaya Çataldaş (SKÇ), PhD, Tuğba Şahin Tokatlıoğlu (TŞT), and PhD Candidate Ayşe Eminoğlu (AE) contributed equally to the research design, the drafting, and revision of the manuscript. Data analysis and interpretation were done by SKÇ with supervision of a biostatistician. Assist. Prof. Seda Karakaya Çataldaş was primarily responsible for conducting and interpreting the data analyses.

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Data availability
The data supporting the findings of this study were collected using "Qualtrics" and "InquisitWeb" and are stored securely on the platforms. Access to the data can be provided upon reasonable request, subject to institutional data-sharing policies and participant privacy agreements.

Declarations

Ethics approval and consent to participate
Ethical approval was obtained from the Koç University Committee on Human Research (2024.417.IRB3.179), and written informed consent was obtained from all participants. I confirm that all methods were performed in accordance with the relevant guidelines. All procedures were performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Consent to publish
Not applicable.

Competing interests
The authors declare no competing interests.

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References

1. Rosendale N, Goldman S, Ortiz G, Haber L. Acute clinical care for transgender patients. JAMA Intern Med. 2018;178(11):1535. https://doi.org/10.1001/jamainternmed.2018.4179.
2. Cicero EC, Reisner SL, Silva SG, Merwin E, Humphreys J. Health care experiences of transgender adults. Adv Nurs Sci. 2019;42(2):123–38. https://doi.org/10.1097/ans.0000000000000256.
3. Karakaya S, Kutlu FY. LGBT individuals' opinions about their health care experiences: A qualitative research study. J Nurs Manag. 2021;29(1):24–31. https://doi.org/10.1111/jonm.13199.
4. Soner G, Aydin Avci İ. LGBTI + Persons' Experiences, Expectations, and suggestions for improving LGBTI + Healthcare services in turkey: A qualitative study. Issues Ment Health Nurs. 2023;44(9):834–43. https://doi.org/10.1080/01612840.2023.2245903.
5. Derbyshire DW, Keay T. Nurses' implicit and explicit attitudes towards transgender people and the need for trans-affirming care. Heliyon. 2023;9(11):e20762. https://doi.org/10.1016/j.heliyon.2023.e20762.
6. Manns-James L. Finding what is hidden: A method to measure implicit attitudes for nursing and health-related behaviours. J Adv Nurs. 2015;71(5):1005–26. https://doi.org/10.1111/jan.12626.
7. Chapman EN, Kaatz A, Carnes M. Physicians and implicit bias: how Doctors May unwittingly perpetuate health care disparities. J Gen Intern Med. 2013;28(11):1504–10. https://doi.org/10.1007/s11606-013-2441-1.
8. Edgoose JYC, Quiogue M, Sidhar K. How to identify, understand, and unlearn implicit bias in patient care. Fam Pract Manag. 2019;26(4):29–33. https://pubmed.ncbi.nlm.nih.gov/31287266/.
9. Narayan MC. Addressing implicit bias in nursing: A review. Am J Nurs. 2019;119(7):36–43. https://doi.org/10.1097/01.NAJ.0000569340.27659.5a.
10. Howard CM, Wofford LG, Phillippi RD. Nurses' implicit attitudes regarding sexual and gender minorities. OJIN Online J Issues Nurs. 2024;29(1):NPAG.
11. Hamtzani O, Mama Y, Blau A, Kushnir T. Implicit and explicit attitudes toward gay men and lesbian women among heterosexual undergraduate and graduate psychology and nursing students. Front Psychol. 2022;13:921313. https://doi.org/10.3389/fpsyg.2022.921313.
12. Lim FA, Hsu R. Nursing students' attitudes toward lesbian, gay, bisexual, and transgender persons: an integrative review. Nurse Educ Perspect. 2016;37(3):144–52. https://doi.org/10.1097/01.nep.0000000000000004.
13. Díaz DA, Maruca A, Gonzalez L, Stockmann C, Hoyt E. Using simulation to address care of the transgender patient in nursing curricula. BMJ Simul Technol Enhanc Learn. 2017;3(2):65–9. https://doi.org/10.1136/bmjstel-2016-000147.
14. Altmiller G, Wilson C, Jimenez FA, Perron T. Impact of a virtual patient simulation on nursing students' attitudes of transgender care. Nurse Educ. 2023;48(3):131–6. https://doi.org/10.1097/NNE.0000000000001331.
15. Carvalhais M, et al. Estudantes de enfermagem e Comunidade LGBT. Rev Investig Inov Saúde. 2020;3(2):61–73. https://doi.org/10.37914/riis.v3i2.95.
16. Özkan F, Uslu SN. The relationship between nursing students' attitudes towards gender roles and their attitudes towards lesbian and gay individuals. Health Acad Kastamonu. 2021;6(3):182–94. https://doi.org/10.25279/sak.766997.
17. Torrente-Jimenez R, Gasch-Gallén A, Graells Sans A, Fernàndez Lamelas E, Feijoo-Cid M. Nursing students' care of and attitudes towards lesbian, gay, bisexual, trans, and intersex people in times of COVID-19 in spain: A cross-sectional study. J Nurs Manag. 2022;30(7):2633–41. https://doi.org/10.1111/jonm.13821.
18. Wang YC, Miao NF, You MH. Attitudes toward, knowledge of, and beliefs regarding providing care to LGBT patients among student nurses, nurses, and nursing educators: A cross-sectional survey. Nurse Educ Today. 2022;116:105472. https://doi.org/10.1016/j.nedt.2022.105472.
19. Gölge ZB, Akdemir S. Turkish validity and reliability study of the attitudes toward transgendered individuals scale. Curr Approaches Psychiatry. 2019;11(Suppl 1):261–75. https://doi.org/10.18863/pgy.621350.
20. Greenwald AG, McGhee DE, Schwartz JL. Measuring individual differences in implicit cognition: the implicit association test. J Pers Soc Psychol. 1998;74(6):1464–80. https://doi.org/10.1037/0022-3514.74.6.1464.
21. Cornelius JB, Carrick J. A survey of nursing students' knowledge of and attitudes toward LGBT health care concerns. Nurse Educ Perspect. 2015;36(3):176–8. https://doi.org/10.5480/13-1223.
22. García-Acosta J, et al. Measuring explicit prejudice and transphobia in nursing students and professionals. Nurs Rep. 2020;10(2):48–55. https://doi.org/10.3390/nursrep10020008.
23. Safer JD, Tangpricha V. Care of the transgender patient. Ann Intern Med. 2019;171(1):ITC1–16. https://doi.org/10.7326/AITC201907020.
24. Fisher AD, Castellini G, Fanni E, Casale H, Tagliagambe M, Benni L. Levels of transphobia and homophobia in individuals with gender dysphoria, the general population, and healthcare providers. J Sex Med. 2016;13(Suppl 2):S124. https://doi.org/10.1016/j.jsxm.2016.03.118.
25. Çakır H, Harmancı Seren AK. Are nurses homophobic? A survey study in public hospitals in Turkey. J Nurs Scholarsh. 2020;52(6):613–22. https://doi.org/10.1111/jnu.12596.
26. Özdemir RC, Erenoğlu R. Attitudes of nursing students towards LGBT individuals and the affecting factors. Perspect Psychiatr Care. 2022;58(1):239–47. https://doi.org/10.1111/ppc.12941.
27. Della Pelle C, Cerratti F, Di Giovanni P, Cipollone F, Cicolini G. Attitudes towards and knowledge about lesbian, gay, bisexual, and transgender patients among Italian nurses: an observational study. J Nurs Scholarsh. 2018;50(4):367–74. https://doi.org/10.1111/jnu.12388.
28. Rowniak SR. Factors related to homophobia among nursing students. J Homosex. 2015;62(9):1228–45. https://doi.org/10.1080/00918369.2015.1037135.
29. Fradelos EC, et al. Translation and validation of nursing students' knowledge and attitudes of Lesbian, Gay, Bisexual, transgender health concerns survey in

the Greek Language. Healthc (Basel). 2022;10(12):2547. https://doi.org/10.3390/healthcare10122547.
30. Brandelli CA, et al. Web-based intervention to change practitioners' attitudes toward LGBT. J Health Psychol. 2016;21(3):356–68. https://doi.org/10.1177/1359105316628748.
31. Sabin JA, Riskind RG, Nosek BA. Health care providers' implicit and explicit attitudes toward lesbian women and gay men. Am J Public Health. 2015;105(9):1831–41. https://doi.org/10.2105/AJPH.2015.302631.
32. Uysal Toraman A, Ağartıoğlu Kundakçı G, Ulusoy Şahin C. Attitudes of nurses toward lesbian, gay, bisexual, and transgender (LGBT) individuals in Turkey. Int J Caring Sci. 2020;13(3):1914–22.
33. Ajzen I, Fishbein M, Lohmann S, Albarracín D. The influence of attitudes on behavior. In: Albarracín D, Johnson BT, editors. The handbook of attitudes. 2nd ed. New York: Routledge; 2018. pp. 197–255.
34. Eagly AH, Chaiken S. The advantages of an inclusive definition of attitude. Soc Cogn. 2007;25(5):582–602. https://doi.org/10.1521/soco.2007.25.5.582.
35. Wilson TD, Lindsey S, Schooler TY. A model of dual attitudes. Psychol Rev. 2000;107(1):101–26. https://doi.org/10.1037/0033-295x.107.1.101.
36. Fazio RH. Multiple processes by which attitudes guide behavior: the mode model as an integrative framework. Adv Exp Soc Psychol. 1989;23:75–109. https://doi.org/10.1016/S0065-2601(08)60318-4.
37. Feinsod F, Wagner C. The ethical principle of justice: The purveyor of equality. Ann Longterm Care [Internet]. 2008 [cited 2025 Aug 5]. Available from: https://www.managedhealthcareconnect.com/article/8210
38. Zuzelo PR. Improving nursing care for lesbian, bisexual, and transgender women. J Obstet Gynecol Neonatal Nurs. 2014;43(4):520–30. https://doi.org/10.1111/1552-6909.12477.
39. Berman A, Snyder SJ, Frandsen G. Fundamentals of nursing: Concepts, process, and practice. 10th ed. New York: Pearson; 2016.
40. American Nurses Association. Code of ethics for nurses with interpretive statements [Internet]. Washington (DC): American Nurses Association; [cited 2025 Aug 5]. Available from: https://www.nursingworld.org/practice-policy/nursing-excellence/ethics/code-of-ethics-for-nurses/
41. Davoodvand S, Abbaszadeh A, Ahmadi F. Patient advocacy from the clinical nurses' viewpoint: A qualitative study. J Med Ethics Hist Med. 2016;9:1–8.
42. Tia MB, Aziato L, Dzansi G. Exploring Ghanaian nurses' knowledge and application of bio-ethical principles in postoperative pain management. PLoS ONE. 2022;17(10):e0276422. https://doi.org/10.1371/journal.pone.0276422.
43. Velasco RAF. Stigma among transgender and gender-diverse people accessing healthcare: A concept analysis. J Adv Nurs. 2022;78(3):698–708. https://doi.org/10.1111/jan.15040.
44. Ekitli Beycan G, Çam MO. A review of our handicapped area of care process for LGBTI. J Psychiatr Nurs. 2017;8(3):179–87.
45. McCann E, Brown M. The needs of LGBTI people within student nurse education programs: A new conceptualization. Nurse Educ Pract. 2020;47:102828. https://doi.org/10.1016/j.nepr.2020.102828.

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