

RESEARCH

Open Access



Nursing students' views on men in nursing: a gender diversity challenge in the healthcare workforce

Mirko Prosen^{1*} and Tamara Čekada²

Abstract

Background Nursing remains a female-dominated profession, with men often facing societal stereotypes and professional challenges that limit their representation. Gender-based misconceptions about caregiving roles and masculinity influence the perception of men in nursing, posing barriers to inclusivity. This study explores nursing students' perceptions of men in nursing, focusing on the prevalence of gender stereotypes, their potential impact on career decisions and the ethical implications of such misperceptions.

Methods A descriptive cross-sectional survey was conducted on a convenience sample of 184 nursing students in Slovenia. Data were collected through an online questionnaire using the GEMINI (Gender Misconceptions of Men in Nursing) Scale. Internal consistency of the adapted scale was confirmed with a Cronbach's alpha of 0.859.

Results Findings reveal that while some gender stereotypes persist, most students hold neutral or positive attitudes toward men in nursing. The overall median GEMINI score was 33.00, significantly lower than the theoretical median of 51 ($p < 0.001$), indicating generally low levels of gender-based misconceptions. Postgraduate students reported lower misconceptions (Me = 30.50) compared to undergraduates (Me = 33.50). Male students had a slightly higher median score (34.50) than female students (33.00), suggesting they may hold slightly more stereotypical views. Challenges included societal biases, limited mentorship, and struggles with professional identity, particularly in clinical settings and specialties perceived as traditionally female-dominated. Students with family members in nursing reported a median of 33.50, compared to 33.00 among those without, suggesting a modest exposure effect, although not statistically significant.

Conclusions Addressing gender-based misconceptions through education and public awareness is critical for fostering diversity and creating a more inclusive nursing workforce. Future efforts should focus on redefining nursing as a gender-neutral profession. Curricula should incorporate discussions about diversity, gender equity, and professional identity development, fostering inclusivity and reducing stereotypes early in students' careers. Targeted mentorship programs, increased male representation in nursing leadership, and reframing nursing as a profession that values both technical expertise and emotional intelligence are essential strategies for breaking down persistent stereotypes and improving gender diversity in the field.

*Correspondence:
Mirko Prosen
mirko.prosen@fvz.upr.si

Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Clinical trial number Not applicable.

Keywords Male representation, Workforce, Diversity, Education, Mentorship, Professional identity

Background

Nursing has historically been regarded as a female-dominated profession, with its roots in caregiving being associated with traditional notions of femininity. While men were historically present in the profession, their representation has been minimal in modern nursing, with current global estimates indicating that men represent approximately 10% of the nursing workforce in many high-income countries and as little as 2–3% in some low- and middle-income countries [1–3]. In Slovenia, the representation of men in nursing follows a similar trend of underrepresentation. Between 2010 and 2019, the proportion of male nurses with a bachelor's degree increased from 6.17 to 11.34%, while the average proportion of male registered nursing assistants (RNAs) in the same period was 13.77% [2]. More recent data from 2020 to 2023 confirms a continued but modest increase in the proportion of males. Among Bachelor's degree graduates, the proportion of men increased from 13.2% in 2020 to 15.0% in 2023, while the proportion of men among RNAs increased slightly from 17.9 to 18.7% over the same period [4].

The underrepresentation of men in nursing has been attributed to persistent gender stereotypes, societal norms, and cultural biases that paint nursing as a career unsuitable for men, often questioning their masculinity and caregiving abilities [5–7]. Despite incremental increases in the proportion of male nurses in recent decades, many continue to face significant barriers both during their education and professional careers [5, 8–11]. For example, male nursing students often report experiences of isolation, lack of mentorship, and gender-based stereotypes that undermine their confidence and professional identity. Educational institutions and clinical environments have been criticized for perpetuating these biases through language, curricula, and a lack of male representation in faculty and leadership roles [7, 12].

In professional practice, male nurses encounter additional challenges, including difficulties with emotional labour, particularly in specialties like paediatrics or in cases when delivering intimate care, where societal norms and cultural perceptions exacerbate their minority status. Such challenges not only discourage men from entering or remaining in nursing but also limit their career progression and satisfaction [1, 13]. Furthermore, studies indicate that male nurses often feel compelled to adhere to traditional masculine norms, such as prioritizing technical over emotional skills, which complicates their integration into the caregiving ethos of nursing [14, 15].

Efforts to recruit and retain male nurses have been met with mixed success. Campaigns aimed at “rebranding” nursing as a gender-inclusive profession have occasionally succeeded in increasing male enrolment but often fail to address deep-seated cultural and institutional barriers. As a result, the proportion of male nurses has remained stagnant in many regions worldwide, particularly in specialties perceived as heavily gendered, such as paediatrics or obstetrics [14, 16–19]. This underrepresentation and the persistence of gender-based misconceptions raise important ethical issues as they are in conflict with the core values of the nursing profession - justice, equality and respect for human dignity. Such prejudices can limit fair access to educational and professional opportunities and reinforce systemic inequalities in nursing practise [3, 5, 20].

Despite the growing body of literature on gender issues in nursing, there is still a lack of empirical research that utilises validated measurement tools to systematically examine nursing students' perceptions and stereotypes of men in nursing. Addressing this gap is important to inform educational and institutional interventions to promote equity and inclusion. The aim of this study was to explore how male and female nursing students perceive men in nursing. Furthermore, to explore possible correlations between these perceptions, their attitudes and their socio-demographic characteristics in order to contribute to a deeper understanding of the context, barriers and opportunities faced by men in the nursing profession. The study addresses how gender stereotypes can lead to exclusion, marginalisation or inequality and highlights the ethical challenges related to justice, fairness and respect for professional identity in nursing practise.

Methods

Study design

A descriptive cross-sectional online survey design, following a pilot study, was used to collect data from nursing students in the spring of 2024. The STROBE reporting guidelines were used [21].

Sample and setting

The convenience sample included 184 full-time and part-time nursing students enrolled in undergraduate and postgraduate nursing programmes in Slovenia (Table 1). Using the G*Power software, a statistical power analysis was conducted for a linear bivariate regression analysis. Using the G*Power software, a statistical power analysis was conducted for a linear bivariate regression analysis. With an effect size of 0.15, a total sample size of 184

Table 1 Demographics

Variable	n	%
Gender		
Man	36	19.6
Woman	148	80.4
Non-binary	/	/
Prefer not to say	/	/
Other	/	/
Year of study		
1st year	49	26.6
2nd year	47	25.5
3rd year	50	27.2
Graduate year*	38	20.7
Type of study		
Full-time	84	45.7
Part-time	100	54.3
Level of study		
Undergraduate (1st cycle)	148	80.4
Postgraduate (2nd and 3rd cycle)	36	19.6
Do your immediate family members work in nursing?		
Yes	52	28.3
No	132	81.0
Was nursing your primary choice?		
Yes	149	81.0
No	35	19.0
Are/were you employed during your studies?		
No	45	24.5
Yes, I worked in a paid role in the nursing field	113	61.4
Yes, I worked outside the nursing field	26	14.1

Note. n – frequency; % – percentage; * status granted to students who have completed all required coursework for their degree but have not yet completed their thesis

participants, an alpha error probability of 0.05, and a beta error probability of 0.153, the statistical power ($1 - \beta$ error probability) was determined to be 0.847. These parameters confirm that the sample size used in the study was sufficient to detect the expected effect with a high degree of confidence while maintaining acceptable levels of type I and type II error probabilities.

Data collection

All data were collected through an online survey using the 1KA.si platform. Participants accessed the survey via a web link or QR code between March and April 2024. The questionnaire was distributed and promoted through social media platforms and directly by contacting nursing faculties and student organizations.

The “Gender Misconceptions of Men in Nursing (GEMINI) Scale” was originally developed in English by Montayre et al. [22]. The GEMINI Scale is a robust, valid, reliable, and easy-to-administer tool designed to assess misconceptions about men in nursing, which may potentially influence academic performance and retention. The original GEMINI demonstrated excellent reliability,

validity, and accuracy, with a Cronbach’s alpha of 0.892 [22]. The scale was translated into Slovenian following the methodology recommended by de Castro Araújo Neto, Tavares [23]. This process involved forward and backward translation to ensure both linguistic and cultural equivalence.

The questionnaire consisted of 17 items, with responses captured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Scores on the GEMINI scale ranges from 17 to 85, with lower scores (closer to 17) indicating fewer misconceptions and stereotypes about men in nursing, while higher scores (closer to 85) reflect more pronounced misconceptions and stereotypes. The theoretical median value of the scale is 51 and provides a reference point for interpreting the attitudes and perceptions of the respondents.

The survey began with a detailed explanation of the informed consent process to ensure ethical compliance, followed by an option for participants to either confirm or decline their consent. In the second section, participants were asked to provide sociodemographic data, including their age, gender, details about their decision to study nursing, and information about their study programme.

Prior to conducting the main study, a pilot study was conducted to assess the clarity, comprehensibility and internal consistency of the scale. The convenience sample in pilot study comprised 17 nursing students, including 5 male students (29.4%) and 12 female students (70.6%). Of these, 12 students (70.6%) were enrolled in a full-time programme, while 5 students (29.4%) were enrolled in a part-time programme. In terms of study programme, 9 students (52.9%) were enrolled in an undergraduate programme and 8 (47.1%) in a postgraduate programme. The pilot study revealed no particular problems with the clarity or comprehensibility of the GEMINI scale. Furthermore, the results were encouraging, with a high reliability score confirmed by a Cronbach’s alpha coefficient of 0.859, indicating strong internal consistency [24].

Data analysis

Data were transferred from 1KA.si into SPSS Statistics (v. 29; IBM Corp., Armonk, New York, USA) for data cleaning and potential recategorization before analysis. The initial dataset, consisting of 205 responses, was reduced to 184 complete responses after the cleaning process. To assess the internal consistency of the Slovenian version of the GEMINI scale, the Cronbach’s alpha coefficient was calculated. Additionally, various statistical analyses were performed, including descriptive statistics (frequency distributions, minimum and maximum values, mean, standard deviation, median, and interquartile range). Bootstrap analyses with 1000 iterations were performed to estimate bias-corrected and accelerated confidence

Table 2 GEMINI scale descriptive statistics

Item	Min	Max	Me	M	SD
Men nurses often experience communication difficulties with other healthcare professionals.	1	4	2.00	1.86	0.818
Men should choose other professions that pay more than nursing.	1	5	2.00	1.73	0.863
Nursing is often a “dead-end” job for men.	1	5	2.00	1.71	0.850
Being caring does not come naturally for men in nursing.	1	5	2.00	1.93	0.935
Nursing erodes the masculine identity of men.	1	5	2.00	1.70	0.772
As a minority group, it is difficult for men to be successful in nursing.	1	5	2.00	1.82	0.846
Compared to other health professionals (e.g. physiotherapist, dietitian, podiatrist), nursing is a low status job for men.	1	5	2.00	2.02	1.035
Men in nursing are often just used as “muscles” by their female nurses.	1	5	3.00	2.97	1.175
Men are less suited to nursing as a career than women.	1	4	1.50	1.65	0.761
Men who are nurses are not taken seriously by other health professionals.	1	4	2.00	1.70	0.812
I would not encourage a male family member (e.g. brother, son or cousin) to choose nursing as a career.	1	5	2.00	2.00	1.169
Men who choose nursing as a career are mostly gay.	1	4	1.00	1.32	0.542
Nursing is not an appropriate profession for men from certain cultural and religious groups.	1	5	2.00	1.74	0.879
Men nurses are often ostracised (isolated) by female nurses in the clinical settings.	1	5	2.00	1.76	0.830
Men have less opportunities for advancement in nursing than women.	1	5	1.50	1.67	0.812
Patients are generally reluctant to be nursed by men nurses.	1	5	2.00	2.23	1.004
The mass media (e.g. television and movies) puts most men off nursing.	1	5	2.00	2.39	1.130

Note. Me – Median; M – Mean; SD – Standard deviation

intervals for medians, due to violations of normality assumptions as confirmed by the Kolmogorov-Smirnov test ($p < 0.05$). Bootstrapping was chosen to ensure robust estimation of central tendency and sampling variability in the presence of non-normal data distributions. Linear regression models, along with the Mann-Whitney U and Kruskal-Wallis tests, were used due to the non-normal distribution of data, confirmed by the Kolmogorov-Smirnov test ($p < 0.05$). A significance level of 0.05 was applied throughout the analysis.

Table 3 Wilcoxon signed-rank test results comparing observed median to hypothetical median on the GEMINI scale

Total n	Test statistic	Standard error	Standardized test statistic	p
167	36.000	717.376	-11.684	<0,001

Note. n – sample; p – p-value (statistical significance)

Results

Demographic and contextual characteristics

The majority of respondents identified as women (80.4%), while men represented 19.6% of the sample. Regarding the year of study, the distribution was relatively balanced, with the largest proportion of respondents in their 3rd year (27.2%), followed by 1st-year students (26.6%), 2nd-year students (25.5%), and those in the graduate year (20.7%). In terms of study type, more respondents were enrolled in part-time study programs (54.3%) compared to full-time programs (45.7%). For the level of study, the majority were enrolled in undergraduate programs (1st cycle) (80.4%), while fewer respondents were in postgraduate programs (19.6%) (Table 1). A notable proportion of participants reported having close family members working in nursing (28.3%), indicating potential influences on their career choice. The majority of respondents confirmed that the nursing study programme was their first choice (81.0%), reflecting a strong initial interest in the field. Regarding employment during their studies, most participants worked in paid roles within nursing (61.4%), while a smaller percentage worked outside the nursing field or were not employed at all.

Descriptive statistics

The results indicate that there is a tendency among nursing students to reject stereotypical perceptions of men in the nursing profession (Table 2). The item “Men in nursing are often just used as ‘muscles’ by their female nurses” had the highest mean score (2.97 ± 1.175), indicating relatively stronger agreement compared to other items. Conversely, the item “Men who choose nursing as a career are mostly gay” had the lowest mean score (1.32 ± 0.542), suggesting the least agreement among respondents. Several items reflected moderate variability, such as “Patients are generally reluctant to be nursed by men nurses” (2.23 ± 1.004) and “The mass media (e.g., television and movies) puts most men off nursing” (2.39 ± 1.130). Overall, most items showed relatively low mean scores, indicating that respondents generally disagreed with the stereotypes and misconceptions outlined in the scale.

The Wilcoxon signed-rank test for a one-sample design revealed that the median scores (Me = 33) on the GEMINI scale were significantly lower than the hypothetical median of 51 ($p < 0.001$) (Table 3). This indicates a generally low prevalence of negative beliefs about men in nursing among the 184 respondents. The observed

median score fell within the first quartile, which suggests that most respondents held neutral or positive attitudes toward men in the nursing profession. The range of scores (17 to 59) and a mean of 32.2 further confirm this trend, with most responses falling below the hypothetical median. The standard deviation of 8.58 reflects some variability in responses, but the low overall scores indicate that negative attitudes or stereotypes about men in nursing are not common in this sample. The test results are reported as both the sum of signed ranks ($W = 36.000$) and the standardized test statistic ($Z = -11.684$), in accordance with standard reporting practices for non-parametric analyses (Table 3).

Association between demographic and contextual factors and perceptions of men in nursing

The data revealed that family members working in nursing did not significantly influence respondents' perceptions of men in the field. Both groups, those with and without family members in nursing, reported similar median scores, with bootstrap analysis confirming these results. For respondents with family members in nursing care, the median GEMINI score was 33.50 (95% CI: 30.00–37.00), while for respondents without family members it was 33.00 (95% CI: 31.00–34.00) with a p -value of 0.354, indicating no statistical significance. There were also no significant differences in perception when choosing nursing as the first study option. Both groups had an identical median score of 33.00, which was confirmed by bootstrap analysis (95% CI for first choice: 31.00–34.00; 95% CI for non-first choice: 28.01–35.50). The overlapping confidence intervals indicate no statistically significant differences in either case ($p = 0.973$). However, the Mann-Whitney U -test indicated a statistically significant difference in perceptions based on gender. Male respondents scored slightly higher ($Me = 34.50$) compared to female respondents ($Me = 33.00$), with a p -value of 0.030. The standardized effect size was small ($r = 0.16$), suggesting that although statistically significant, the difference in perceptions is modest. This finding indicates that male respondents hold slightly more stereotypical views regarding men in nursing compared to their female counterparts.

The bootstrap analysis also provided robust confidence intervals for the median GEMINI scale scores by study level. Bachelor's students had a median score of 33.50 (95% CI: 32.00–35.00), while master's students had a lower median score of 30.50 (95% CI: 27.00–33.00). The overlapping confidence intervals confirm no statistically significant difference between the two groups ($p = 0.290$). The median GEMINI score for the younger group was 33.00 (95% CI: 31.00–34.00), while the older group had a slightly higher median of 34.00 (95% CI: 30.00–36.00). Although the mean scores suggest a small difference

(89.78 for 19–25 years vs. 96.37 for 26–52 years), the overlapping confidence intervals and non-significant p -value indicate that age group does not have a significant impact on perceptions of men in nursing as measured by the GEMINI scale ($p = 0.408$). Employment during the study was analysed in three categories: no employment, employment within nursing and employment outside nursing. Although the median values varied slightly (33.00, 32.00 and 36.00 respectively), the differences were not statistically significant ($p = 0.125$). A 1000-iteration bootstrap analysis confirmed these findings, with the median GEMINI score being 33.00 (95% CI: 32.50–36.00) for respondents who were not employed while studying, 32.00 (95% CI: 30.00–34.00) for those who were employed within nursing, and 36.00 (95% CI: 30.00–38.00) for those who were employed outside nursing. The overlapping confidence intervals suggest that the type of employment during the programme does not have a significant impact on perceptions of men in nursing ($p = 0.125$), although the slightly higher median score for those employed outside nursing may warrant further investigation (Table 4).

Discussion

This study aimed to examine the perceptions of male and female nursing students' perceptions of men in nursing, focusing on how stereotypes and socio-demographic factors influence their views. The findings are consistent with the existing literature, which points to ongoing challenges and emerging opportunities for greater male representation in the nursing profession. Despite gradual progress, men continue to be significantly underrepresented. They are hindered by societal norms and stereotypes that portray nursing as a predominantly female profession. These barriers not only discourage men from entering the nursing profession, but also hinder their integration and career advancement [1, 2, 16].

The idea that nursing is a “female” profession is still a major obstacle for male nurses. Studies have consistently shown that men are criticised for their masculinity and nursing skills, with stereotypes portraying them as less empathetic or caring than their female counterparts [1, 2, 25]. These stereotypes are particularly pronounced in specialities such as paediatrics, where male nurses are not perceived to be as caring as female nurses traditionally are [16]. The persistence of such stereotypes not only undermines the professional identity of nurses, but also perpetuates society's perception of nursing as a gendered profession. As Martsof et al. [26] highlight, the misconception that nursing roles require predominantly “feminine” skills discourages men from entering the profession. Reframing nursing as a technical and leadership-oriented field could help address these stereotypes. To further address these prejudices, targeted education and

Table 4 Comparative results among demographic and contextual variables

Variable		n	Me	IQR	Test	Z	df	p
Family members working in nursing	Yes	52	33.50	14	(U) 3125.0	-0.945	–	0.354
	No	132	33.00	11				
Nursing as a first choice of study	Yes	149	33.00	12	(U) 2598.0	-0.034	–	0.973
	No	35	33.00	12				
Gender	Male	36	34.50	14	(U) 2042.5	-2.171	–	0.030
	Female	148	33.00	12				
Level of study	Undergraduate	148	33.50	12	(U) 2361.0	-1.058	–	0.290
	Master's programme	36	30.50	10				
Age group	19–25 years	108	33.00	13	(U) 3819.0	-0.827	–	0.408
	26–52 years	76	34.00	11				
Employment during study	None	45	33.00	9	(H) 4.152	–	2	0.125
	Job in nursing	113	32.00	13				
	Non-nursing job	26	36.00	13				

Note. n – frequency; Me – Median; IQR – Interquartile Range; U-test – Mann-Whitney U Test; H-test – Kruskal-Wallis Test; Z – standardized test statistic; df – Degrees of freedom; p – p-value (statistical significance)

public health measures are needed to change societal attitudes towards the nursing profession [25].

From a sociological perspective, nursing's status as a feminized profession reflects broader patterns of occupational segregation and societal gender norms. Historically, caregiving roles have been undervalued and seen as extensions of women's reproductive roles, leading to the exclusion of men from these professions [1]. This dynamic creates a cycle where societal expectations discourage men from pursuing nursing, perpetuating gender imbalances. Additionally, cultural constructs of masculinity, which prioritize autonomy and technical expertise over emotional labour, exacerbate role conflicts for male nurses. Grant et al. [10] emphasize that systemic barriers such as implicit bias and insufficient mentorship for men in nursing amplify these challenges, particularly for minority male nurses. These challenges are compounded in cultures and regions with rigid gender norms further constrain male participation in caregiving roles [5, 13].

Systemic issues further compound the challenges faced by men in nursing. Institutional biases, such as the feminization of nursing roles and the lack of male mentors, hinder the recruitment and retention of men in the profession [18]. The phenomenon of the “glass escalator,” where men in nursing are perceived to ascend to leadership roles more quickly, creates a paradox; while offering career advantages, it can alienate men from clinical caregiving roles, reinforcing stereotypes of technical competency over emotional labour [7]. In this context, Sumpter et al. [27] also point out the importance of diversity in nursing education and leadership, calling for intentional efforts to recruit and support men in nursing programs to address these systemic gaps.

Moreover, workplace discrimination and harassment persist as significant issues. Male nurses often report feelings of exclusion and difficulties establishing collegial relationships in predominantly female environments [7].

These experiences, coupled with higher rates of sexual harassment than their female peers, highlight the need for targeted interventions to foster inclusive and equitable workplaces [5]. Expanding mentorship networks and focusing on equity-driven initiatives could help mitigate these challenges and build a more inclusive nursing workforce [26]. Therefore, institutions must go beyond individual-level solutions and adopt comprehensive organisational measures aimed at promoting psychological safety, inclusive communication practises and transparent grievance procedures. Leadership accountability and routine monitoring of workplace culture should be an integral part of these efforts to ensure that inclusive values are not only stated, but actively practised.

The findings emphasize the urgent need for systemic reform to remove entrenched gender bias and support male nurses in their profession. Recruitment campaigns must prioritize changing societal perceptions of nursing as a gender-neutral profession and use tools such as the GEMINI scale to measure and mitigate gender misconceptions among nursing students [22]. These campaigns should also emphasize the diverse roles and opportunities of nursing and counter stereotypes that portray the profession as exclusively female or nursing-focused [28].

Institutions play a crucial role in promoting a favourable environment for male nurses. Key initiatives include introducing structured mentoring programmes to reduce feelings of isolation and creating opportunities for male nurses to take on visible leadership roles [5, 29]. It is equally important to address unconscious bias in the hiring and promotion of nurses, as research shows that such bias can marginalize male nurses and contribute to higher turnover rates [8, 29].

In addition, targeted strategies should aim to normalize the presence of male nurses in specialties such as paediatrics and obstetrics, where they are often underrepresented due to societal and institutional stereotypes

[5, 30]. These efforts must also extend to combating discrimination and harassment in the workplace, which disproportionately affect male nurses and discourage them from continuing to work [5]. Furthermore, the nursing curriculum should include discussions of gender diversity to refute stereotypes early in students' careers. Such strategies could include the integration of modules on gender roles and inclusion into basic nursing courses, the organisation of mentoring programmes with male role models and the promotion of inclusive clinical placements that challenge traditional gender expectations. This approach is supported by the use of validated instruments such as the GEMINI scale, which provides a robust framework for identifying and dispelling misconceptions [12, 22]. Together, these measures can help to break down harmful stereotypes and promote a more inclusive and equitable care workforce.

When compared with international studies using the GEMINI scale, the results from the present Slovenian sample indicate a relatively lower prevalence of stereotypical beliefs toward men in nursing. For example, Ramjan et al. [31] found a higher overall mean GEMINI score of 38.9 among Australian nursing students, while Xu et al. [12] reported moderate misconceptions among Chinese students, particularly in the "Emotionality" and "Masculinity" domains. In contrast, the Slovenian students in this study showed overall lower median GEMINI scores ($Me = 33$), suggesting weaker endorsement of gendered stereotypes. These results may indicate regional differences in gender perceptions or reflect the influence of recent educational policy discussions in Slovenia on diversity and inclusion. While no direct causal relationship can be established in the context of this study, the relatively lower agreement with gender stereotypes observed in the Slovenian sample suggests that shifts in societal discourse or curricular attention to gender equity in nursing education may be contributing factors. Further research would be required to confirm these influences and to investigate their extent and consistency between institutions. However, these findings also highlight that gender misconceptions are not absent, particularly among male students, who scored slightly higher on the GEMINI scale.

From an ethical perspective, these findings emphasise the moral obligation of nursing education and practise to actively combat gender stereotypes and discrimination. The persistence of misconceptions about male nurses not only undermines professional identity, but also violates the principles of justice, fairness and respect for the person that underpin ethical nursing practise [3, 32]. Addressing these stereotypes is therefore not just a social issue, but an ethical imperative that directly relates to quality of care, patient trust and equal access to professional opportunities. As Sumpter et al. [27] argue,

educational strategies must consciously incorporate principles of diversity, equity, inclusion and anti-racism to support the broader goal of health equity. Specific ethical strategies could include mandatory ethics training that addresses implicit bias and gender equality, formal policy statements from schools of nursing that affirm a commitment to gender inclusion, and mechanisms for reporting and addressing gender discrimination or harassment in both educational and clinical settings. In this context, reframing nursing as a gender-equitable profession contributes to an ethical care environment in which all professionals can fully engage without prejudice or marginalisation [27].

Limitations

This study has several limitations that need to be considered. Firstly, due to the cross-sectional design, it is only possible to draw limited causal conclusions about the observed relationships between the variables. As the data were collected at a single point in time, the directionality of these relationships remains somewhat uncertain. Secondly, the convenience sampling method may limit the generalizability of the results. Participants were drawn exclusively from undergraduate nursing programs in Slovenia, which may not reflect the perspectives of nursing students in other cultural, educational, or institutional contexts. As such, the study's findings should be interpreted with caution, particularly in relation to broader populations [33]. Thirdly, the use of self-report data harbours the possibility of response bias. Participants may have given responses that were influenced by social desirability and may have deviated from their true beliefs or attitudes. This type of bias is a known limitation in survey-based research and can influence the reliability of findings [34]. Although the GEMINI scale was previously validated and adapted to the Slovenian context, cultural nuances may have influenced participants' interpretation of certain items, potentially affecting the reliability of the results. This demonstrates the importance of considering cultural variability in survey research to ensure the validity of adapted measurement tools.

Finally, the non-randomized sampling and the under-representation of male nursing students in the sample may have influenced the results, especially given the study's focus on gender perceptions. This imbalance may limit the applicability of the conclusions to broader or more diverse populations, highlighting the need for more inclusive sampling in future studies. Future research should also consider longitudinal or experimental designs and include a more representative group of participants. Such approaches would address these limitations and provide deeper insights into gender dynamics and related factors in nursing education. Employing multi-method or mixed-method designs could also enhance

the robustness of findings and help clarify the causal relationships between variables [35].

Conclusions

Although progress has been made in increasing the proportion of men in nursing, significant barriers remain. Overcoming these challenges requires a multifaceted approach that goes beyond superficial recruitment campaigns. Systemic reforms in education, workplace policy and public perception are essential to break down deep-seated gender stereotypes and promote inclusivity. Educational institutions should incorporate discussions of gender diversity into curricula, relying on tools such as the GEMINI scale to disprove misconceptions early in students' careers.

In addition, healthcare organizations need to promote an equal work environment by addressing implicit bias, ensuring mentoring opportunities and combating discrimination. By normalizing the presence of men in all specialties of nursing and emphasizing the technical and leadership dimensions of the profession, nursing can position itself as a truly gender-neutral field. These efforts are important not only for equity, but also to ensure that the nursing workforce reflects and serves the diverse populations it serves. Future research and policy efforts must prioritize sustainable strategies to address these barriers to ultimately improve the profession's ability to meet evolving healthcare needs worldwide.

Acknowledgements

We would like to express our sincere gratitude to all the students who participated in this study and generously shared their perspectives. Your contributions have been invaluable in advancing our understanding of gender dynamics in nursing. A special thank you is extended to Dr. Sabina Ličen, Associate Professor, for her insightful peer review and consultations during the analytical phase of this study. Her expertise and guidance were instrumental in preparing this manuscript.

Author contributions

M.P.: Conceptualization, Methodology, Data Analysis, Writing – Original Draft Preparation. T.Č.: Data Curation, Investigation, Writing – Reviewing and Editing.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Data availability

The datasets used in this study are not available due to ethical restrictions on sharing raw data. However, they can be obtained from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Commission of the University of Primorska for Ethics in Human Subjects Research (Approval No: 4264-16-3/2022). All participants were informed about the purpose and procedures of the study prior to data collection. Participation was voluntary, and informed consent was obtained from all participants.

Consent for publication

The consent process included permission to use anonymized data for research purposes and for publication in scientific journals. No identifying information about participants is included in the manuscript.

Competing interests

The authors declare no competing interests.

Author details

¹Faculty of Health Sciences, University of Primorska, Polje 42, Izola 6310, Slovenia

²University Medical Centre Ljubljana, Zaloška cesta 2, Ljubljana 1000, Slovenia

Received: 9 May 2025 / Accepted: 30 June 2025

Published online: 02 July 2025

References

- Martínez-Morato S, Feijoo-Cid M, Galbany-Estragués P, Fernández-Cano MI, Arrecedo Marañoñ A. Emotion management and stereotypes about emotions among male nurses: a qualitative study. *BMC Nurs.* 2021;20(1):1–10. <https://doi.org/10.1186/s12912-021-00641-z>.
- Prosen M. Nursing students' perception of gender-defined roles in nursing: a qualitative descriptive study. *BMC Nurs.* 2022;21(1):104. <https://doi.org/10.1186/s12912-022-00876-4>.
- Smith BW, Rojo J, Everett B, Montayre J, Sierra J, Salamonson Y. Professional success of men in the nursing workforce: an integrative review. *J Nurs Manag.* 2021;29(8):2470–88. <https://doi.org/10.1111/jonm.13445>.
- National Institute of Public Health. Data portal – Health Care Resources 2025. [Internet] <https://podatki.nijz.si/pxweb/sl/NIJZ%20podatkovni%20por>
- Chang HE, Jeong S. Male nurses' experiences of workplace gender discrimination and sexual harassment in South Korea: a qualitative study. *Asian Nurs Res (Korean Soc Nurs Sci).* 2021;15(5):303–9. <https://doi.org/10.1016/j.anr.2021.09.002>.
- Meadus RJ, Twomey JC. Men student nurses: the nursing education experience. *Nurs Forum.* 2011;46(4):269–79. <https://doi.org/10.1111/j.1744-6198.2011.00239.x>.
- Smith CM, Lane SH, Brackney DE, Horne CE. Role expectations and workplace relations experienced by men in nursing: a qualitative study through an interpretive description lens. *J Adv Nurs.* 2020;76(5):1211–20. <https://doi.org/10.1111/jan.14330>.
- Ashkenazi L, Livshitz-Riven I, Romem P, Grinstein-Cohen O. Male nurses in Israel: barriers, motivation, and how they are perceived by nursing students. *J Prof Nurs.* 2017;33(2):162–9. <https://doi.org/10.1016/j.profnurs.2016.08.001>.
- Bordelon CJ, Mott J, McArthur E, MacWilliams B. Men in female-dominated nursing specialties. *Nurs Clin North Am.* 2023;58(4):617–25. <https://doi.org/10.1016/j.cnur.2023.06.005>.
- Grant E, Cary MP, Jones M, Glymph D, Akintade BF. State of black men in nursing: an oral history of the challenges and the benefits of five black male nurse leaders. *Nurs Outlook.* 2025;73(1):102316. <https://doi.org/10.1016/j.outlook.2024.102316>.
- Popper-Giveon A, Keshet Y, Liberman I. Increasing gender and ethnic diversity in the health care workforce: the case of Arab male nurses in Israel. *Nurs Outlook.* 2015;63(6):680–90. <https://doi.org/10.1016/j.outlook.2015.08.001>.
- Xu H, Liang C, Kong J, Chen Q, Zhao Y, Zhang F. Reliability and validity evaluation of the Chinese version of the gender misconceptions of men in nursing (GEMINI) scale among nursing students. *BMC Nurs.* 2024;23(1):266. <https://doi.org/10.1186/s12912-024-01939-4>.
- Lyu X-C, Sun X-Y, Lee L-H, Yang C-I. To do or not to do: male nurses' experiences of providing intimate care to female patients in China: a constructivist grounded theory study. *BMC Nurs.* 2024;23(1):227. <https://doi.org/10.1186/s12912-024-01896-y>.
- Deng J, Wang P, Tian X, Li K, Yang L, Ding S. Turnover intention and its influencing factors among male nurses in China: a national-scale descriptive study. *BMC Nurs.* 2024;23(1):833. <https://doi.org/10.1186/s12912-024-02501-y>.
- Sevilla MP, Rangel VS. Males in nurse technician programs: a social cognitive analysis of gender differences in career development. *Int J Educ Vocat Guid.* 2024. <https://doi.org/10.1007/s10775-024-09679-2>.

16. Deuz N. Public perceptions of males working as nurses in pediatrics. *Pediatr Nurs*. 2023;49(3):118–24. <https://doi.org/10.62116/pnj.2023.49.3.118>.
17. Gigli KH, Dierkes A, Dill J, Martsolf G. Opportunities to diversify the pediatric nursing workforce: a focus on male nurses. *J Pediatr Health Care*. 2024;38(2):260–9. <https://doi.org/10.1016/j.pedhc.2023.11.010>.
18. Qureshi I, Ali N, Randhawa G. British South Asian male nurses' views on the barriers and enablers to entering and progressing in nursing careers. *J Nurs Manag*. 2020;28(4):892–902. <https://doi.org/10.1111/jonm.13017>.
19. Saleh MYN, Al-Amer R, Al Ashram SR, Dawani H, Randall S. Exploring the lived experience of Jordanian male nurses: a phenomenological study. *Nurs Outlook*. 2020;68(3):313–23. <https://doi.org/10.1016/j.outlook.2019.10.007>.
20. Nerges JA, Hofmann L, Garrett L, Morton PG. Male nurses' perceptions of the facilitators and barriers to recruitment, retention, and job satisfaction. *Nurse Lead*. 2022;20(1):31–6. <https://doi.org/10.1016/j.mnl.2021.08.011>.
21. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol*. 2008;61(4):344–9. <https://doi.org/10.1016/j.jclinepi.2007.11.008>.
22. Montayre J, Alananzeh I, Bail K, Barnewall K, Beament T, Campbell S, et al. Development and psychometric testing of the gender misconceptions of men in nursing (GEMINI) scale among nursing students. *Contemp Nurse*. 2022;58(4):253–63. <https://doi.org/10.1080/10376178.2022.2107041>.
23. de Castro Araújo Neto F, Tavares TMA, de Menezes Santos D, da Fonseca FL, de Araújo DCSA, Mesquita AR, et al. Cross-cultural adaptation and psychometric evaluation of the modification of hall's professionalism scale for use with pharmacists. *BMC Med Educ*. 2023;23(1):871. <https://doi.org/10.1186/s12909-023-04815-y>.
24. Field A. *Discovering statistics using IBM SPSS statistics*. 5th ed. London: SAGE; 2018.
25. Teresa-Morales C, Rodríguez-Pérez M, Araujo-Hernández M, Feria-Ramírez C. Current stereotypes associated with nursing and nursing professionals: an integrative review. *Int J Environ Res Public Health*. 2022;19(13):7640.
26. Martsolf GR, Gigli K, Case B, Dill J, Dierkes A. Describing the male registered nursing workforce toward increasing male representation in professional nursing. *Nurs Outlook*. 2023;71(6). <https://doi.org/10.1016/j.outlook.2023.102081>.
27. Sumpter D, Blodgett N, Beard K, Howard V. Transforming nursing education in response to the future of nursing 2020–2030 report. *Nurs Outlook*. 2022;70(6 Suppl):S20–31. <https://doi.org/10.1016/j.outlook.2022.02.007>.
28. Forrest B. Men in nursing: smoke and mirrors. *Br J Nurs*. 2023;32(5):234. <https://doi.org/10.12968/bjon.2023.32.5.234>.
29. Smith CM, Horne CE. Educational and professional experiences of men in nursing: an interpretive description study to guide change and foster inclusive environments for men in nursing. *J Prof Nurs*. 2024;53:123–30. <https://doi.org/10.1016/j.profnurs.2024.05.008>.
30. Baker MJ, Fisher MJ, Pryor J. Male nurse practice in inpatient rehabilitation: finding a safe way: a grounded theory. *Int J Nurs Stud*. 2023;143:104506. <https://doi.org/10.1016/j.ijnurstu.2023.104506>.
31. Ramjan LM, Maneze D, Salamonson Y, Zugai J, Bail K, Liu X-L, et al. Undergraduate nursing students challenge misconceptions towards men in nursing: a mixed-method study. *J Adv Nurs*. 2024;80(4):1638–51. <https://doi.org/10.1111/jan.15914>.
32. Juliff D, Russell K, Bulsara C. Male or nurse what comes first? Challenges men face on their journey to nurse registration. *Aust J Adv Nurs*. 2017;34(2):45–52. <https://doi.org/10.37464/2017.342.1518>.
33. Clark T, Foster L, Sloan L, Bryman A. *Bryman's social research methods*. 6th ed. Oxford: Oxford Univ; 2021.
34. Wang X, Cheng Z. Cross-sectional studies: strengths, weaknesses, and recommendations. *Chest*. 2020;158(1 Suppl):S65–71. <https://doi.org/10.1016/j.chest.2020.03.012>.
35. Maier C, Thatcher JB, Grover V, Dwivedi YK. Cross-sectional research: a critical perspective, use cases, and recommendations for IS research. *Int J Inf Manag*. 2023;70:102625. <https://doi.org/10.1016/j.ijinfomgt.2023.102625>.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.