Evaluating gender awareness, gender-related health knowledge and patient pain legitimation among nursing students: A quasi-experimental study

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A B S T R A C T

The aim of the study was to measure the associations between and the evolution of gender awareness, gender-related health knowledge and patient pain legitimation among nursing students.
Background: Evidence indicates that gender equity skills are still lacking among nurses. Indeed, several studies report gender-biased patient assessment and care, arguing that greater attention should be paid to the gender perspective at university, in order to train nurses who are sensitive to this issue. Recently, certain gender perspective measurement scales have been adapted to the nursing population, offering new opportunities for the educational field.
Design: A quasi-experimental study was used for this study.
Methods: This study was conducted in the second semester of the first year of the Nursing Degree run by the University of the Basque Country. A sample of 103 students enrolled in the Anthropology, Ethics and Legislation module completed the Nijmegen Gender Awareness in Medicine Scale, the Pain Legitimation Scale and the Gender Perspective Health Knowledge Scale before and after the second semester, during which part of the syllabus focused on developing gender equity skills. Data were collected between January - April 2022.
Results: We found positive correlations between gender-related health knowledge and pain legitimation at post-test, and between said knowledge and gender sensitivity at both pre- and post-test ($p < 0.05$). The repeated measures indicated that traditional expositive teaching did not increase overall scores for gender awareness, gender-related health knowledge or pain legitimation.
Conclusions: The results suggest that gender-related health knowledge may be a key modifiable factor that leads to enhanced gender awareness in dealings with patients. However, traditional expositive lectures were not enough to produce a robust increase in gender awareness, pain legitimation or gender-related health knowledge levels. The effectiveness of active teaching methodologies should be tested, in order to help nursing students strengthen their resistance to clinical gender stereotypes and become active assets in the move from inequality to equity.

1. Introduction

The World Health Organisation (World Health Organization, 2018) defines gender as roles, characteristics, and opportunities that are considered appropriate for men, women, boys, girls, and individuals with non-binary identities. Gender is also the product of interpersonal relationships and may reflect the power distribution between people. It is not a static concept, but rather changes with time and place (World Health Organization, 2018). Developing this definition even further, the

WHO also states that when people or groups fail to comply with the rules (including concepts of masculinity and femininity), roles, responsibilities and relationships associated with gender, they often become the object of stigmatisation, social exclusion and discrimination, all of which may negatively affect health (World Health Organization, 2018).

Gender bias in health emerges when there is discrimination between men and women in terms of the treatment or healthcare they receive, providing this difference in treatment is not justified by the patients'

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medical condition or sex-related physiological differences (Risberg et al., 2008; Ruiz-Cantero, 2009). This bias is reflected in the advice given to patients by healthcare professionals, as well as in the diagnosis, treatment, standardised care and adherence to established protocols and clinical guidelines. Its consequences include poorer health outcomes, more frequent and more serious complications, greater morbidity and a higher mortality rate (Risberg et al., 2009). It is worth noting that, in Spain, both access to healthcare services and health status perceptions are lower among women than among men (Spanish Ministry of Equality. Women's Institute, 2021a, 2021b).

Some studies argue that gender may, to a certain extent, modulate the way in which the healthcare professionals in charge of a service respond to an individual, with differences being observed in patient prioritisation, care, diagnosis and treatment. This response may in turn determine (among other things) the use of analgesics and invasive therapeutic strategies, and pain assessment at triage (Kuhn et al., 2017; Mauvais-Jarvis et al., 2020). Late detection of health problems increases associated morbidity and mortality (Ruiz-Cantero, 2009).

Some authors draw attention to the fact that, despite the incorporation of certain gender policies into health research, many professionals have yet to assimilate existing evidence of sex-based differences and the influence of sex and gender in general, which is why this perspective is still not reflected in clinical practice (Mauvais-Jarvis et al., 2020). In light of this, some studies recommend including gender awareness in the university training provided to healthcare professionals, as a means of fostering a health system populated by people sensitive to the issue of gender equity (Ruiz-Cantero et al., 2019; Valls-Llobet, C.,2020).

As a profession at the frontline of primary healthcare, nursing cannot afford to turn a blind eye to gender inequality. In 2021, there were 330,745 registered nurses in Spain, and nursing was the largest of the health professions, with a ratio of seven nurses for every one thousand inhabitants (National Institute of Statistics, 2022).

Despite the above, however, the majority of studies on the gender perspective in healthcare have focused on the medical profession, and nursing has been largely overlooked, even though there is sufficient evidence to indicate the need for studies with nurses also. For example, in Jordanian rehabilitation centres, Daibes et al. (2017) found that nursing staff were less tolerant of female drug addicts than of male ones, and a multi-centre study in Australia reported that nurses prioritised men with acute coronary syndrome over women with the same condition, and waited longer to send them for an electrocardiogram (Kuhn et al., 2017). In terms of pain management, other authors have found that, in identical cases involving people of both sexes, nurses deem women's pain to be less intense and are more reticent to administer opiates for the purposes of pain relief (Wandner et al., 2014). Another study found that higher sexism and gender stereotype levels correlated with less pain legitimation in relation to female patients, although not in relation to male ones (Prego-Jimenez et al., 2022). Recently, some gender awareness measurement instruments, such as the Nijmegen Gender Awareness in Medicine Scale (NGAMS) (Aliri et al., 2022), the Pain Legitimation Scale (Bernardes and Lima, 2011) and the Gender Perspective Health Knowledge Scale (Prego-Jimenez et al., under review), have been adapted to the nursing population, thereby enabling the accurate assessment of this parameter in this profession.

In the Spanish Nursing Degree syllabus that was adapted to conform to the requirements of the European Higher Education Area, gender equality is dealt with in the module entitled 'Anthropology, Ethics and Legislation' (National Agency for Quality Assessment and Accreditation, 2004).

It is important to measure the impact of this module on the gender awareness of future nurses. The aim of the present study was therefore to measure the association between and the evolution of gender awareness, pain legitimation and gender-related health knowledge among nursing students during the second semester of the first year of their degree.

2. Methods

2.1. Research site and subjects

The study was conducted in the Faculty of Medicine and Nursing of the University of the Basque Country (UPV/EHU), located in San Sebastian (Basque Country, Spain). Implementation of the study took place during the 2021–2022 academic year. Inclusion criteria were: first-year nursing degree students at the UPV/EHU, enrolled in the Anthropology, Ethics and Legislation module. A total of 103 students agreed to participate. Of these, 5 refused further participation during the eleven-week follow-up phase, meaning that the final sample comprised 98 participants.

2.2. Research design and process

The study followed a quasi-experimental design and was conducted in three stages: 1) completion of the baseline questionnaire (pre-test; January 2022); 2) delivery of conventional teaching (January-April 2022); and 3) completion of the eleven-week follow-up questionnaire (post-test; April 2022).

Prior to the pre-test, the PI (principal investigator) or Co-PI explained the purpose of the study and outlined participants' rights and obligations. At baseline, a link was sent to those students who had agreed to participate in the study, enabling access to the online questionnaire (pre-test). Respondents completed a sociodemographic questionnaire and answered questions linked to gender-related health knowledge, gender awareness and pain legitimation based on a clinical case. Subsequently, conventional teaching was carried out between weeks 2 and 10 of the semester, and a post-test questionnaire was completed in week 11.

2.3. The conventional teaching method

Students attended theoretical lectures and performed group activities within the Anthropology, Ethics and Legislation module, a 6-ECTS course taught during the second semester of the first year of the nursing degree. The main topics included in this module were as follows: 1) anthropology applied to health, 2) principles of professional ethics, and 3) legal framework for healthcare. The first topic (anthropology applied to health), which was the one most closely related to the variables included in the present study (namely gender-related health knowledge and gender awareness), was developed during fourteen hours of lectures and six hours of group activities. The competency this topic sought to develop was the ability to analyse the influence of culture on health in order to prevent and detect situations of inequality and gender violence among children and older adults.

2.4. Instruments

The instruments used were 1) the Gender Perspective Health Knowledge Scale, 2) the Spanish version of the Nijmegen Gender Awareness in Medicine Scale (S-NGAMS) and 3) Pain Legitimation Scale based on a clinical case. The baseline information questionnaire also encompassed several demographic variables, including age, gender, country of birth, experience in the healthcare field, and qualifications in the healthcare field.

2.4.1. The gender perspective health knowledge scale

The Gender Perspective Health Knowledge Scale (Prego-Jimenez et al., under review) is a 10-question measure created using the nominal group technique, in which each question has four possible answers, of which only one is correct, and another is 'I do not know'. The scale explores respondents' knowledge of gender-related health issues, starting with basic level questions (e.g., It refers to people's biological characteristics, in terms of reproductive organs and functions based on physiology, chromosomes and hormones. What concept are we referring

to? a) Sex; b) Gender; c) Sex and gender mean the same thing; or d) I do not know), and progressing on to more difficult ones (e.g., Please choose the correct option in relation to lipoedema: a) Its incidence is less than 1% in both men and women; b) It has no clinical repercussions, it is an aesthetic problem related to obesity; c) The World Health Organization recognised it as a disease in 2018; or d) I do not know). Since the Gender Perspective Health Knowledge Scale is a set of questions containing a battery of multiple-choice questions that are intentionally multifaceted, internal consistency reliability estimates are not applicable (Salgado et al., 2002). Regarding criterion validity, the correlation between Gender Perspective Health Knowledge Scale and gender sensitivity was statistically significant and of moderate magnitude both at pre-test ($p < 0.001$; R = 0.433) and post-test ($p < 0.001$; R = 0.348).

2.4.2. The Spanish version of the Nijmegen gender awareness in medicine scale (S-NGAMS)

The S-NGAMS (Verdonk et al., 2008) is a self-report questionnaire that assesses gender awareness in healthcare. Although the original scale includes three dimensions assessing gender sensitivity, gender-role ideology towards patients and gender-role ideology towards doctors, in this study, we used only the first two. The scale therefore included 25 items, all rated on a 5-point Likert-type scale (1 = totally disagree to 5 = totally agree). The gender sensitivity subscale comprises 14 items focused on healthcare professionals' attitudes toward gender issues in healthcare. The gender-role ideology towards patients subscale comprises 11 items intended to measure gender-stereotypical thinking about patients. Higher scores on the gender sensitivity subscale suggest more gender sensitivity, and higher scores on the gender-role ideology towards patients subscale indicate more agreement with gender stereotypes. Both factors showed an adequate internal reliability at pre-test (gender sensitivity α = 0.77 and gender-role ideology towards patients α = 0.88) and post-test (gender sensitivity α = 0.81 and gender-role ideology towards patients α = 0.89). Further psychometric features of the S-NGAMS, such as the criterion validity, can be found in Aliri et al. (2022).

2.4.3. Pain legitimation based on a clinical case

A virtual clinical case involving a patient with chronic low back pain was created for the baseline assessment (pre-test), based on the study by Prego-Jimenez et al. (2022). Another clinical case involving a patient with chronic headache was created for the final assessment (see supplementary file 1). A different and equivalent case was proposed for the final assessment, since it was intended to be a new case for students, in order to avoid bias in the results obtained. Two different versions were created for each case (low back pain and headache), one featuring a man and the other featuring a woman. Each participant answered one of the two cases at random during the baseline assessment: *case 1*: Woman with chronic low back pain; *case 2*: Man with chronic low back pain. Then, in the final assessment, those who had answered the woman's case questions in the baseline assessment answered the woman's case questions again (*case 3*: Woman with chronic headache), and those who had answered the man's case questions during the baseline assessment answered the man's case questions again at post-test (case 4: Man with chronic headache). After reading the clinical case, students were asked to respond to 16 items using a Likert-type scale ranging from 1 (nothing) to 7 (exaggerated). The items corresponded to the following subscales: 1) psychological non-attribution to the pain, 2) disability, 3) willingness to offer support, and 4) credibility of the pain. Pain Legitimation Scale showed an adequate internal reliability at pre-test (α = 0.72) and post-test (α = 0.79). Further psychometric features can be found in Bernardes et al., (2011) and Prego-Jimenez et al. (2022).

2.5. Ethical considerations

Identities were kept strictly confidential and all questionnaires were analysed anonymously. All participants gave their consent. The study was approved by the Ethics Committee for research with human beings of the University of the Basque Country, UPV/EHU (CEISH UPV/EHU; M10_2019_139).

2.6. Data analysis

The normal distribution of the data was tested using the Kolmogorov-Smirnov test, and variables with a non-normal distribution were square-root-transformed. Categorical variables are presented here in frequency and percentage terms, and continuous variables are presented as means and standard deviations. Comparisons between demographic characteristics at baseline (pre-test) were performed using an unpaired t test for continuous data and the χ^2 test for categorical data. The Pearson's correlation analysis was used to test the degree of association between scores on the Gender Perspective Health Knowledge Scale and S-NGAMS and overall and subscale scores for Pain Legitimation Scale based on a clinical case at baseline (pre-test) and during the final assessment (post-test). Threshold values for effect size statistics were 0.1, 0.3, and 0.5 for small, moderate, and large effect sizes, respectively (Cohen, 1988). Repeated measures analyses of variance (ANOVAs) were used to determine the effectiveness of the conventional teaching method in increasing participants' gender-related health knowledge, gender awareness and pain legitimation. Partial η^2 values were calculated to estimate effect size, with η^2 values of ≤ 0.02, ≤ 0.13, and ≥ 0.26 being considered small, medium, and large, respectively (Bakeman, 2005). Between-group differences in the effectiveness of the conventional teaching method were assessed using 2-way repeated measures ANOVAs [2 time points (baseline and final assessment) and 2 groups (woman's or man's case)]. All analyses were performed with a significance level of $p < 0.05$. All data analyses were carried out using the SPSS software, version 28.0 (IBM Corporation, Armonk, NY, USA).

3. Results

3.1. Sample characteristics

Participants were aged between 18 and 48 years, with the mean age being 20.6 (SD = 6.1). Most were female (84.5%) Spanish nationals (96.1%) who had no work experience (84.5%) or qualifications in the healthcare field (77.7%) (Table 1). No statistically significant differences were found in terms of age, gender, country of birth, work experience and previous qualifications in the healthcare field ($p > 0.05$) (data not shown in this article).

3.2. Correlations between gender-related health knowledge, gender awareness, and pain legitimation

The Gender Perspective Health Knowledge Scale correlated positively with the gender sensitivity subscale of the S-NGAMS at baseline ($p < 0.001$; R = moderate) (Table 2) and after the intervention ($p < 0.001$; R = moderate) (Table 3).

When the patient featured in the clinical case was a woman, the Gender Perspective Health Knowledge Scale correlated positively at baseline with the disability subscale ($p < 0.05$; R = moderate) (Table 2). After the intervention, the Gender Perspective Health Knowledge Scale correlated positively with both the disability ($p < 0.01$; R = moderate) and the willingness to offer support subscales ($p < 0.05$; R = moderate), as well as with the overall Pain Legitimation Scale score ($p < 0.01$; R = moderate) (Table 3).

When the patient was a man, the Gender Perspective Health Knowledge Scale did not correlate at baseline with any of the subscales or with the overall Pain Legitimation Scale score ($p > 0.05$) (Table 2). After the intervention, the Gender Perspective Health Knowledge Scale correlated positively with the disability subscale ($p < 0.05$; R = small) and the overall Pain Legitimation Scale score ($p < 0.05$; R = small) (Table 3).

Table 1

Descriptive characteristics of participants.

	Mean (SD)	N (%)	Range
Age (years)	20.6 (6.1)		18–48
18–32		96 (93.2)	
33–48		7 (6.8)	
Gender			
Female		87 (84.5)	
Male		16 (15.5)	
Country of birth			
Spain		99 (96.1)	
Nicaragua		2 (1.9)	
China		1 (1.0)	
Paquistán		1 (1.0)	
Do you have work experience in the healthcare field?			
No		87 (84.5)	
Yes		16 (15.5)	
Prior to enrolling in this career, do you have any qualifications in the healthcare field?			
No		80 (77.7)	
Yes		23 (22.3)	

Table 2

Correlations between subscales and total score of Pain Legitimation Scale, S-NGAMS and Gender Perspective Health Knowledge Scale at baseline.

	Gender Perspective Health Knowledge Scale
Gender sensitivity subscale (S-NGAMS)	0.433 ***
Gender-role ideology towards patient's subscale (S-NGAMS)	0.029
Total score Pain Legitimation Scale (Female)	0.147
Psychological non-attribution to the pain subscale (Female)	0.013
Disability subscale (Female)	0.313 *
Willingness to offer support subscale (Female)	-0.036
Credibility of the pain subscale (Female)	0.103
Total score Pain Legitimation Scale (Male)	0.168
Psychological non-attribution to the pain subscale (Male)	0.235
Disability subscale (Male)	0.025
Willingness to offer support subscale (Male)	0.062
Credibility of the pain subscale (Male)	0.125

Note. SD, standard deviation; S-NGAMS, Spanish version of Nijmegen Gender Awareness in Medicine Scale.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

3.3. Effectiveness of the conventional teaching method

The scores obtained in the subscales of the S-NGAMS did not change significantly over the course of the second semester ($p > 0.05$) (Table 4).

In the clinical case, a significant group × time interaction was observed between the gender of the patient and psychological non-attribution of pain ($p < 0.05$). Specifically, among those who were given the woman's case, scores on the psychological non-attribution of pain subscale decreased significantly after the intervention ($p < 0.001$; $\eta^2 = large$), whereas no change was observed among those who were given the man's case ($p > 0.05$).

No significant group x time interaction was observed between the rest of the subscales and the overall pain legitimation score ($p > 0.05$). However, when differences were measured within groups, we observed

Table 3

Correlations between subscales and total score of Pain Legitimation Scale, S-NGAMS and Gender Perspective Health Knowledge Scale at POST.

	Gender Perspective Health Knowledge Scale
Gender sensitivity subscale (S-NGAMS)	0.348 ***
Gender-role ideology towards patient's subscale (S-NGAMS)	-0.073
Total score Pain Legitimation Scale (Female)	0.377 **
Psychological non-attribution to the pain subscale (Female)	0.138
Disability subscale (Female)	0.388 **
Willingness to offer support subscale (Female)	0.324 *
Credibility of the pain subscale (Female)	0.127
Total score Pain Legitimation Scale (Male)	0.296 *
Psychological non-attribution to the pain subscale (Male)	0.054
Disability subscale (Male)	0.288 *
Willingness to offer support subscale (Male)	0.170
Credibility of the pain subscale (Male)	0.253

Note. SD, standard deviation; S-NGAMS, Spanish version of Nijmegen Gender Awareness in Medicine Scale.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4

Effects of the traditional teaching method on S-NGAMS, Gender Perspective Health Knowledge Scale and Pain Legitimation Scale.

	Beginning of semester, mean (SD)	End of semester, mean (SD)	p	Partial η^2
Gender sensitivity subscale (S-NGAMS)	48.7 (8.7)	47.5 (9.8)	0.087	0.030
Gender-role ideology towards patient's subscale (S-NGAMS)	21.3 (7.6)	21.6 (8.0)	0.632	0.002
Gender Perspective Health Knowledge Scale	4.0 (1.8)	3.9 (2.1)	0.352	0.009
Total score Pain Legitimation Scale (Female)	82.0 (7.7)	81.6 (8.6)	0.720	0.003
Psychological non-attribution to the pain subscale (Female)	17.0 (2.6)	15.0 (2.8)#	< 0.001 ***	0.268
Disability subscale (Female)	21.9 (2.9)	22.3 (3.2)	0.460	0.012
Willingness to offer support subscale (Female)	21.9 (2.7)	21.8 (3.6)	0.781	0.002
Credibility of the pain subscale (Female)	21.2 (3.5)	22.4 (3.4)	0.006 **	0.156
Total score Pain Legitimation Scale (Male)	77.1 (7.3)	78.5 (9.6)	0.257	0.026
Psychological non-attribution to the pain subscale (Male)	15.1 (2.7)	14.8 (2.9)#	0.482	0.010
Disability subscale (Male)	21.0 (3.0)	21.6 (3.6)	0.354	0.017
Willingness to offer support subscale (Male)	20.7 (3.0)	20.1 (3.9)	0.286	0.023
Credibility of the pain subscale (Male)	20.3 (3.1)	22.0 (3.6)	< 0.001 ***	0.245

Note. SD, standard deviation; S-NGAMS, Spanish version of Nijmegen Gender Awareness in Medicine Scale.

significant group × time interaction.

** $p < 0.01$, significant change from pre-test to post-test.

*** $p < 0.001$, significant change from pre-test to post-test.

that, after the eleven-week period of conventional teaching, scores on the credibility of pain subscale increased significantly among both those who were given the woman's case ($p < 0.01$; $\eta^2 = medium$) and those

who were given the man's case ($p < 0.001$; $\eta^2 = medium$). No significant differences were observed in the remaining subscales or in the overall Pain Legitimation Scale score ($p > 0.05$) (Table 4).

4. Discussion

In 2006, the WHO (2006) established a curriculum designed to provide academic institutions with adequate preparation concerning the gender perspective, since health professionals who do not receive such training may perpetuate gender bias in the healthcare field (Ruiz-Cantero et al., 2019). In this context, Aliri et al. (2022) adapted the NGAMS to the nursing population (which had previously been overlooked in health-related gender awareness research) and proposed its use by nurse educators to ensure appropriate gender perspective development among nursing students. We applied this scale for the first time as a tool for measuring the effect of expositive gender-related equity teaching on the evolution of gender awareness levels among nursing students, as well as to explore its association with the pain legitimation and gender-related health knowledge constructs.

Our results highlight the potential of declarative gender-related knowledge as a modifiable key factor for increasing gender awareness among nursing students, since it was found to be associated with gender sensitivity scores at both pre- and post-test. Although, to the best of our knowledge, no previous studies have measured the impact of gender-related knowledge on equity attitudes in the same target population, some authors have observed that the acquisition of knowledge was accompanied by a strengthening of patient-centred ethical attitudes, including a greater awareness of the existence of living wills among health professionals (Fernández-Rodríguez et al., 2021; Ramjan et al., 2022). Moreover, the correlations observed between the Gender Perspective Health Knowledge Scale and Pain Legitimation Scale at the beginning of the semester were different from those observed at the end. Whereas at pre-test, the only correlation observed was between gender-related knowledge and the disability subscale in the clinical case involving the female patient, at post-test, knowledge was associated with overall Pain Legitimation Scale scores and disability subscale scores in both clinical cases (man and woman). The fact that we found more associations between these constructs at the end of the semester may indicate that students were applying their conceptual knowledge to their assessments of patient situations. Interestingly, at post-test, students with a higher score on the Gender Perspective Health Knowledge Scale also demonstrated a greater willingness to offer support when the patient in question was female. This correlation suggests that willingness to offer support to female patients may benefit more from the acquisition of gender-related health knowledge than willingness to offer support to male patients. Indeed, in a sample of nursing students, Hampton et al. (2018) found that observers' estimates of their willingness to help were higher in relation to male patients than in relation to female ones.

We also observed certain significant effects of the expositive teaching approach in the repeated measures tests. Specifically, in relation to both female and male patients, credibility of pain increased from the beginning to the end of the semester, suggesting that this period may be crucial for nursing students to gain an awareness of the legitimacy of the most common clinical symptoms (World Health Organization [WHO], 2020). However, this process may be a double-edged sword, since developing attitudes towards patients' pain may also involve the assimilation of certain gender stereotypes. Indeed, students' non-attribution of the female patient's pain to psychological factors decreased from pre-test to post-test in our sample, with this decrease being significant in comparison with the clinical case involving a man. Similarly, in a cross-sectional study carried out with nurses, Bernardes and Lima (2011) found that a woman's pain was significantly more often attributed to psychological causes than a man's. These data may be indicative of gender bias, since the psychological attribution of pain has been associated with the under-diagnosis and under-treatment of

symptoms, and the somatisation of pain is closely associated with women in both the collective and clinical imaginary (Keogh, 2021).

In spite of the above, the repeated measures revealed no differences in the overall scores for gender sensitivity, gender-role ideology towards patients, Pain Legitimation Scale or Gender Perspective Health Knowledge Scale, indicating that traditional expositive lectures are not enough to effectively enhance participants' clinical gender perspective. Similarly, Dielissen et al. (2014) failed to find any improvement in the gender sensitivity and gender-role ideology towards patients subscales of the NGAMS after applying a traditional expositive lesson-based teaching approach with general practitioner trainees. However, they did observe higher gender sensitivity and Gender Knowledge scores after applying a modular-approach teaching strategy that comprised, in addition to the mainstream approach, notions, skills and attitudinal principles, as well as activities designed to encourage reflection. Also in the same vein, a recent study with first-year Master's students demonstrated the effectiveness of a set of reflexivity exercises based on clinical cases and trigger questions for improving awareness of gender bias during medical teaching (Geiser et al., 2022). It therefore seems that active teaching methodologies that include reflexivity may be more effective in enhancing gender awareness among health science students. In this sense, Guided University Debate and Case Method teaching strategies have shown their potential for increasing reflexivity and deep acquisition of complex competences among nursing students (Arrue and Caballero, 2015; Cariñanos-Ayala et al., 2021). This kind of teaching strategy may result in more divergent critical thinking among nursing students, as it focuses on more varied clinical aspects and this contact with diversity may account for the more positive attitudes observed in relation to gender issues in nursing practice, as well as for lower adherence to a binary view of patients.

It is worth mentioning that the young participants in our study had slightly higher gender sensitivity and Pain Legitimation Scale scores than those reported by previous studies carried out with older health professionals in the Basque Country. Specifically, at post-test, our first-year nursing students (mean age= 20.6 years) obtained a mean score of 47.5 on the gender sensitivity subscale, compared to the mean score of 45.0 reported by Aliri et al. (2022) in a more experienced sample (81.1% nurses, 18.9% physicians and 19.4% nursing students in at least their third year; mean age= 30.6). Moreover, our novice students had mean overall scores of 81.6 and 78.5 on the Pain Legitimation Scale for female- and male-patient cases, respectively, as opposed to the scores of 76.9 and 75.5 reported by (Prego-Jimenez et al., 2022), also in relation to an older sample from the Basque Country (66.3% nurses, 16.3% physicians, and 17.4% nursing students; mean age= 31.1). There are several possible reasons for this difference. First, it is possible that younger generations may be more aware of gender equity, since higher sexism levels were found previously among older generations in the same target population as the one defined for the present study (Garaigordobil, 2015), and sexism is negatively associated with gender awareness (Aliri et al., 2022). Second, it may be that novice nurses and physicians' gender awareness tends to decrease as they become more exposed to traditional clinical culture. Indeed, some reviews argue that implicit gender bias is common and well-established, although largely unrecognised, in clinical settings, and highlight the need for gender awareness training in order to change this reality (Pritlove et al., 2019; Tricco et al., 2021).

One of the strengths of the present study is the fact that it is the first to use validated scales measuring gender-related attitudes to patients in the field of nursing education, thereby shedding light on students' learning and concept-networking processes. Furthermore, our results suggest that conceptual knowledge may have the potential to increase gender sensitivity, and that the psychological attribution of pain in women may constitute a particularly challenging gender stereotype that nurse educators should seek to break down.

One of the study's limitations is that the data obtained correspond to a fairly homogeneous population, most of whom were Spanish and all of

whom were studying at a single university. The results cannot therefore be directly applied to all nursing students. Moreover, most participants in our sample were women, although this is consistent with the current context of the profession. Future research may wish to analyse the same variables in a broader sample, taking participants' gender into account also.

5. Conclusion

We found that greater gender-related health knowledge correlated positively with higher levels of gender sensitivity and pain legitimation, suggesting that this type of knowledge may be a key modifiable factor that leads to enhanced patient-related gender awareness. The results obtained in this study indicate that traditional expositive teaching is not enough to bring about a robust increase in gender awareness, pain legitimation and knowledge levels. However, it did change some of the dimensions of the pain legitimation construct, with the credibility awarded to patients' pain increasing significantly, although the non-attribution of pain to psychological factors decreased in relation to female patients (although not male ones). The effectiveness of active teaching methodologies, such as Guided University Debate and the Case Method, should be tested in order to help nursing students gain greater resistance to clinical gender stereotypes and become active assets in the move from inequality to equity.

CRediT authorship contribution statement

Ainitze Labaka: Conceptualization, Methodology, Writing – original draft. **Asier Zamakola**: Software, Investigation, Writing – original draft. **Marta Arrue**: Writing – review & editing, Project administration, Funding acquisition. **Haritz Arrieta**: Methodology, Formal analysis, Writing – original draft.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.nepr.2023.103790.

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