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What is gender awareness in health? A scoping review of the concept, its operationalization, and its relation to health outcomes

Authors: Rita Morais[1,2], Sónia F. Bernardes[1,2] & Petra Verdonk[3]

[1] Instituto Universitário de Lisboa (ISCTE-IUL), Lisbon, Portugal

[2] Centro de Investigação e Intervenção Social (CIS-IUL), Lisbon, Portugal

[3]Amsterdam UMC-VUmc, Vrije Universiteit Amsterdam, department Ethics, Law & Humanities, APH research institute, De Boelelaan 1117, Amsterdam, Netherlands

Corresponding author: Rita Morais, ISCTE-IUL/CIS-IUL, ritamjmorais@gmail.com
Avenida das Forças Armadas, 1649-026 Lisbon, Portugal
Tm.:00351 918 136 758

Orcid ID Rita Morais: orcid.org/0000-0003-0043-8785; Orcid ID Sónia Bernardes: orcid.org/0000-0002-6664-4859; Orcid ID Petra Verdonk: orcid.org/0000-0003-0464-8210

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ABSTRACT

Gender awareness emerged in the 1990s and aimed to provide awareness and sympathy towards the needs of women, measuring health care providers' attitudes towards them and understand if providers possessed the knowledge for appropriate care. According to Miller et al.'s seminal model, gender awareness incorporates three sub-dimensions: *gender sensitivity*, *gender ideology* and *knowledge*. Gender awareness has the potential to minimize gender bias in health care improving ecological validity of research. This *scoping* review provides an analysis of how gender awareness has been conceptualized, operationalized and investigated in its relationship with health-related outcomes.

A search was conducted on PubMed, PsycINFO and ERIC. The relevance of 2.589 articles was assessed and 14 empirical studies were selected and included.

Difficulties conceptualizing gender awareness were found and gender awareness and gender sensitivity were often presented as interchangeable. Most papers aimed to measure and compare levels of gender awareness among health professionals and the relationship between gender awareness and relevant health-related outcomes was not studied.

Drawing upon a critical analysis of our findings, a proposal for a revised gender awareness conceptualization and operationalization is put forth as to inform novel research on its association with gender bias in health and health care.

Keywords: gender awareness; gender sensitivity; scoping review; gender bias.

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Introduction

Sex and gender are determinants of individuals' health (e.g. Crolla and Bamforth 2011; Dielissen, Bottema, Verdonk, and Lagro-Jassen 2011; Gahagan, Gray, and Whynacht 2015; Gochfeld 2010; Verdonk, Benschop, de Haes, and Lagro-Janssen 2009). Sex is a descriptive concept used to categorize human beings based on their biological characteristics such as genes (chromosomes), genitalia, and gonads (hormones) (Deaux 1985; Unger 1979; Unger and Crawford 1993). Although a binary conceptualization of sex (males vs. females) has been dominant in most societies, it has recently been challenged as to better encompass the diversity of human sexual characteristics (e.g., including a third category referring to the intersexes; Karkazis 2008). Gender is a more fluid construct referring to socially constructed and widely shared representations of what it means to be and act as a member of a certain sex category, *i.e.*, masculinity(ies) and femininity(ies) (Deaux 1985; Unger 1979; Unger and Crawford 1993; Verdonk et al. 2009; Tannenbaum, Greaves, and Graham 2016).

One of the most well-known and alarming examples of the dangers of ignoring the role of sex and gender as disease determinants is the case of coronary heart disease (CHD). Ignoring the role of sex and gender in the development of CHD often results from serious gender biases in etiology attributions and symptom interpretations (e.g., precordial pain is more often misattributed to anxiety when presented by women than men) (Appelman, Rijn, Haaf, Boersma, and Peters 2015; Mosca et al. 2007; Maas et al. 2011; Regitz-Zagrosek et al. 2016). This often leads to underdiagnosing and undertreating women's CHD, ultimately accounting for their higher mortality and morbidity rates after (un)recognized myocardial infarctions (Abbey and Stewart 2000; Bello and Mosca 2004; Biddle, Fallavollita, Homish, and Orom 2019; Jacobs and Eckel 2005; Westerman, and Wenger 2016).

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It has been argued that increasing healthcare professionals' gender awareness may be a main strategy to minimize gender biases in health and their deleterious consequences for individuals' health (e.g. Verdonk, et al. 2009). Increasing healthcare professionals' gender awareness would imply promoting positive attitudes towards considering the role of sex and gender in health and illness and having the knowledge and skills necessary to incorporate them into clinical practice, as to promote more equitable healthcare (e.g., Verdonk et al. 2009). However, this is easier said than done. Despite the huge amount of evidence on gender biases in health (e.g. Appelman et al. 2015; Mosca et al. 2007; Maas et al. 2011; Regitz-Zagrosek et al. 2016; Verdonk et al. 2009) and the surmounting body of knowledge on the role of sex and gender in health and illness, research on implementing and validating the importance healthcare professionals' gender awareness seems to be lagging behind (e.g. Celik, Lagro-Janssen, Widdershoven, and Abma 2011; Lindsay, Rezai, Koine, and Osten 2019). Given the strategic importance of this concept for promoting gender equity in health care, this review generally aims to investigate how researchers have conceptually and empirically approached gender awareness in health-related contexts over the past 20 years, since it was first conceptualized by Miller, King, Wolfe, and King (1999).

Gender Awareness: conceptualization, relevance, and implications

Miller et al. (1999) defined a *Model of Gender Awareness in Veterans Administration Health Care* in the United States of America, where the health needs of veteran women, a growing population in this context, were severely overlooked. In that era, it was relevant to conceptualize gender differences from the perspective of healthcare professionals and to develop a conceptual model about gender awareness in the health services to guide research and intervention. Miller et al.'s gender awareness

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model offered a broad concept that included three dimensions: *gender sensitivity*, i.e., the degree to which a healthcare worker was aware of and sympathetic towards the needs and requirements of female patients; *gender ideology*, representing healthcare workers' stereotypical attitudes towards female patients and; *knowledge,* i.e. the degree to which healthcare workers possessed accurate information about female patients and their needs. The authors conceived of these dimensions as interrelated, e.g., *gender sensitivity* and *gender ideology* towards female veterans could influence the way in which health-care professionals seek and retain information/*knowledge* about these women and their health-related needs. The three-dimensional model could be applied to healthcare professionals (physicians, nurses, etc.) as well as clerical personnel (administrators and managers, physical plant workers, technicians, etc.). In sum, this was the first and unique model proposing a three-dimensional conceptualization of gender awareness in health care as an intra-individual attribute, which could be measured and applied to different healthcare professionals.

To the best of our knowledge, so far two literature reviews about gender awareness in health-related contexts have been published. Celik et al. (2011) carried out a systematic review aiming at identifying the opportunities and barriers for the implementation of gender sensitive healthcare. According to these authors, healthcare professionals' gender sensitivity meant to have the ability to incorporate gender differences in their actions in medical practice. Their review included 11 studies from a total of 752 articles identified and assessed in CINAHL, PsycINFO, Medline, EBSCO and Cochrane (1998-2008). The results showed that gender sensitivity implementation depended on several opportunities and barriers at (Celik et al. 2011): (1) professional level (*i.e*. including gender issues in medical curricula, training professionals); (2) organizational level (*i.e*. culture, infrastructures, protocols and guidelines of medical

institutions), and; (3) political level (*i.e.* national policies, decentralization of the policies). A successful implementation of gender sensitivity in healthcare would be intimately related to professionals, structures and systems. Also, in a recent mixed-methods systematic review, Lindsay et al. (2019) aimed to understand which gender sensitivity training programmes or interventions for healthcare professionals were undertaken to evaluate outcomes and to document areas for further research. Lindsay et al. (2019) defined gender sensitivity as a key component of patient-centered care, referring to healthcare professionals having knowledge of sex and gender differences in health and the skills to incorporate it into their practice. In their review, 29 studies were included from a total of 2,320 articles identified in seven databases: EMbase, JSTOR, PsycINFO, Medline, Healthstar, CINAHL and Scopus (1998-2018). The results showed that 14 studies focused on gender sensitivity related to reducing gender bias and 15 studies focused on addressing the needs of Lesbian, Gay, Bisexual and Transgender (LGBT) patients. Of all these studies, 37% showed significant improvements in gender-related attitudes, knowledge and practices after gender sensitivity training. Multiple training methods were used to teach gender-sensitive care and the content of training included learning about sex-related and gender-related terminology, understanding gender inequalities in health, stigma and discrimination and also communication skills. Although the authors concluded that gender sensitivity training for healthcare professionals is increasing, they also pointed out that there is insufficient evidence to determine its efficacy.

There are several issues in these two reviews that laid the ground for the present study. First, in both reviews the authors have conceptualized and used the term of gender sensitivity instead of gender awareness (Celik et al. 2011; Lindsay et al. 2019). This points towards a possible conceptual confusion around these two concepts that

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may potentially undermine gender awareness research and intervention. Indeed, a potential conceptual confusion between these two concepts may bear deleterious implications for gender awareness measurement strategies and, ultimately, implementation. Such confusion regarding gender awareness conceptualization and operationalization may hamper the process of obtaining systematic knowledge about the relationship between gender awareness and health-related outcomes in several health and disease processes, namely, in reducing gender bias. Indeed, none of these reviews shows the impact of gender awareness on health-related outcomes, such as diagnoses, prescriptions of exams or treatments. In sum, although recent research suggests that implementing interventions on gender awareness is important, the lack of clarity on how to achieve such implementation may also be the result of an unprecise and unclear understanding and use of the concept of gender awareness, its operationalization and therefore, its potential to reduce gender bias.

Our main goal is to conduct a *scoping review* to specifically provide answers to the following questions: Since the Miller et al.'s model was first published in 1999 (1) how has gender awareness been defined and conceptualized?; (2) how has gender awareness been operationalized?, and; (3) what evidence supports the relationship between gender awareness and health-related outcomes?

Method

Drawing upon the guidelines for conducting scoping reviews (Arksey and O'Malley 2005; Garrard 2011; Grant and Booth 2009; Mays, Roberts, and Popay 2011; Peters, Godfrey, Khalil, McInerney, Parker and Soares 2015), this literature review study was carried out in four steps: 1) identification of records; 2) abstract screening; 3) eligibility

assessment and inclusion of articles (see Figure 1), and; 4) data extraction and synthesis (see Table 1).

Record Identification

Articles were identified through searches conducted in three electronic databases - PubMed, PsycINFO, and ERIC - for papers published between 1999 (year of Miller's seminal paper) and May 2019. The search was conducted based on two distinct strategies: 1) searching for the following key-words "gender awareness", "gender sensitivity", "gender responsiveness" "gender reflexivity", "gender reflectivity" and "gender consciousness" in the three mentioned databases and; 2) in order to extend the results, the key-words "gender" and "awareness" or one of the related concepts as "sensitivity" or "responsiveness" or "reflexivity" or "reflectivity" or "consciousness" were individually introduced in PubMed and PsycINFO (databases that provided a greater number of relevant papers based on the search strategy described above). The keyword "health" was also added as subject classification term in this search strategy. In total, 2.589 articles were found with duplicates; 181 duplicates were identified and removed (see Figure 1). Also, one article was found by serendipity.

Abstract screening

After the removal of the duplicates (n=181), 2.406 abstracts remained to be screened. Based on the reading of title and abstract, all records written in a language known by at least one of the team members (*i.e.*, English, Portuguese, Spanish, Dutch or French) and focusing on health and gender awareness-related concepts were screened. All non-empirical papers that were not directly relevant to our research questions were excluded, as well as those that fulfilled the following exclusion criteria: 1) articles without primary data; 2) books, reports, dissertations and other types of non-peer-reviewed publications; 3) articles that did not consider gender awareness or gender awareness-

related concepts as an intra-individual attribute, and; 4) not health-related. The reference lists of the included articles were analysed, but no further relevant articles were found. The abstract screening was conducted by the first author of the present paper (RM). One thousand eight hundred and sixty-four papers were removed after abstract screening (see Figure 1).

Eligibility and Inclusion

Nineteen full-text papers were read entirely and assessed for eligibility by the first author (RM) and rechecked by the coauthors (SB or PV). The same inclusion and exclusion criteria were also applied in this step. Five papers were excluded because they were not relevant for our research questions and/or fulfilled the exclusion criteria (see Figure 1). Based on this selection process, 14 articles were included. PUBMED produced the highest number of relevant articles (8) followed by PsycINFO (4) and ERIC (1). Paper 7 (Hammarström, Wiklund, Stålnacke, Lehti, Haukenes, and Fjellman-Wiklund 2016) was identified by serendipity discovery (see Figure 1).

Data synthesis

All articles were examined using the matrix method for literature reviews (Garrard, 2011). This method consists in elaborating a table (see Table 1) that includes the important parameters to be compared. In this review, these parameters were: study setting, main aims, conceptualization of gender awareness, participants, methodology, operationalization of gender awareness, main findings of the study. With the information on these parameters, we aimed to provide answers to our main research questions.

Insert Figure 1 here

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Results

How has gender awareness been conceptualized?

Most studies included in this review provided a definition and conceptualization of gender awareness (see Table 1; # 1, 3, 6, 9, 11, 13, and 14) and/or Gender Sensitivity (#2). Of the seven studies explicitly conceptualizing gender awareness, three (#1, 6 and 11) stated that it included two attitudinal components: (1) *gender sensitivity*, *i.e*., the ability to perceive existing gender differences, issues and inequalities and incorporate these into strategies and actions, and; (2) *gender-role ideology*, *i.e*., health care workers' attitudes towards male and female patients and doctors. These definitions were based on Miller's theoretical model (Miller et al. 1999) but also on literature about gender biases in healthcare and the Stereotype Content Model (World Health Organization 1998; Fiske, Cuddy, Glick, and Xu 2002; Verdonk, Benschop, De Haes, and Lagro-Janssen 2008). In three other studies (#9, 13 and 14), an explicit dimension of *knowledge was* also included and defined as accurate information about the needs, trends and policies regarding female patients, also including the knowledge about the services available for them inside the Veterans Health Administration (based on Miller et al. 1999; Salgado, Vogt, King, and King 2002). It should be noted that in the latter three studies (#9, 13 and 14) the definition of gender awareness was exclusively focused on the very specific context of women's health in U.S.A. Veterans Health Administration. In study #3 gender awareness was defined as a sub-dimension of gender sensitivity, referred to "(…) *the recognition and understanding of gender questions by professionals*" (pp. 1221), hence, reflecting a broader definition of gender awareness compared to those mentioned before.

Six studies did not explicitly define gender awareness (#4, 5, 7, 8, 10 and 12), despite focusing on aspects of the construct as identified in other articles included in

this scoping review. These articles focused on: (1) the implementation of intervention programs aiming at evaluating a developed training program about gender issues integrated in a medicine curriculum (#4); (2) testing the long-term efficacy of a gender medicine program directed to general practitioners (#5); (3) developing tools to increase awareness of gendered and intersectional processes in clinical assessment of patients based on pain rehabilitation case (#7); (4) analyzing whether (and how) gender in different medical relationships varies with physician sex and specialty and exploring how this might be related to working climate and segregation of women and men in various medical specialties(#8); (5) focusing on teaching gender medicine on daily medical practice during clerkships (#10), and finally; (6) focusing on gender integration in medical education (#12).

Study 2 defined gender sensitivity instead of gender awareness. Indeed, and mirroring the conceptual confusion between "sex" and "gender" (e.g., Oakley 1972; Unger 1979), gender awareness and gender sensitivity seem to be sometimes presented as interchangeable constructs. There are at least three types of misunderstandings surrounding gender awareness and gender sensitivity. First, the definition of gender sensitivity in a broader way without clarifying what gender sensitivity entails, such as in study 2, which defines gender sensitivity as sensitivity to gender issues in clinical decision-making processes, but without elaborating on the nature of "gender issues". Study 2 evaluated the development and implementation of an education program on gender and health in three types of conditions: angina pectoris, depression and urinary incontinence. Recommendations for change about these three conditions incorporated increasing gender sensitivity but also gender-role ideologies (e.g. "*a recommendation to integrate gender considerations for depression was based on "women report more symptoms consisted with anxiety than men"*) as well as specific knowledge about the

three conditions (e.g. *" general practitioners should consider sexual issues in the management of incontinence, since it is a risk factor for sexual dysfunction on both women and men"*). The authors only conceptualize gender sensitivity, but its operationalization involves the operationalization of other possible dimensions of gender awareness as initially conceptualized by Millers' seminal paper. Second, the two concepts - gender awareness and gender sensitivity - are used interchangeably. For instance, one of these studies (#3) defined gender awareness as the acknowledgement and understanding of gender questions by health professionals. Here, it seems that gender sensitivity was the main construct that included gender awareness as a sub-dimension. Miller et al. (1999) conceptualized gender awareness and gender sensitivity exactly in opposite way; gender awareness was the main construct and gender sensitivity as a sub-dimension. Third, some papers did not explicitly define gender awareness but used related concepts which caused further confusion. For example, studies refer to "gender-sensitive care" (#4), "gender sensitive doctor-patient communication", "gender sensitive consultation" (#4, 5) without clarifying the concepts and their operationalizations.

In sum, despite these conceptual misunderstandings and although some studies did not define gender awareness or have only mentioned one of its dimensions (i.e. gender sensitivity), a significant part of these studies used the three-fold concept of gender awareness as proposed by Miller et al.'s (1999) theoretical model.

How has gender awareness been operationalized?

In several studies, gender awareness was measured by the *Gender Awareness Inventory – Veterans Administration* (GAI-VA, Salgado et al. 2002) (#9, 13, 14) or the *Nijmegen Gender Awareness in Medicine Scale* (N-GAMS, Verdonk et al. 2008) (#1, 5,

6, 11). Other quantitative operationalizations of gender awareness were used in four studies (#2, 4, 7, 8), and in studies 3, 10, and 12 qualitative methodologies were used.

The GAI-VA, is a self-report instrument developed within the USA Veterans Health Administration that operationalized gender awareness in three dimensions: *gender sensitivity* (29 items; e.g. *women veterans at this hospital should have access to care by experts in women's health*), *gender-role ideology* (29 items; e.g. *compared to men, women's physical complaints are more likely to be caused by mental problems*) and *knowledge* (20 items; e.g. *which of these services is routinely available to female VA patients? (a) abortions; (b) infertility services; (c) menopause management; (d) b and c.).* The attitudinal scales were measured with a 5-point Likert scale ranging from 1= *strongly disagree* to 5=*strongly agree.* The knowledge component was measured by a standard multiple-choice format. The GAI-VA was validated with a sample of 619 health care workers from two large Veteran Health Administration medical centers. The instrument showed a three-factor solution including *sensitivity*, i*deology* and *knowledge* and good internal reliability (αs> .75; Salgado, et al. 2002). GAI-VA levels of gender awareness correlated positively with scores on the Sex-Role Egalitarianism Scale (except for levels of sensitivity in women) and with scores on Attitudes Toward Women Scale, providing support for its convergent validity. Discriminant validity was supported by the absence of correlations between gender awareness and social desirability and negative affectivity. Also, criteria-related validity was preliminary supported, suggesting that scores on GAI-VA may predict judgements related to care offered to veteran women . This instrument is a tool to administrators and policy makers to compare levels of gender awareness over time. Also, GAI-VA has the purpose to understand the kind of care given to these women, understanding their remaining needs, and providing initiatives to better healthcare.

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Compared with the GAI-VA, the N-GAMS operationalized gender sensitivity and gender-role ideologies differently. In the GAI-VA, the operationalization is directed towards women of the United States' veteran population that is traditionally marked by men. The N-GAMS operationalized both attitudinal components to measure whether medical students were sensitive and sympathetic towards the impact of gender in medical practice. Also, the measurement of gender-role ideologies was extended by assessing stereotypes towards male patients and physicians. However, the N-GAMS did not include a measure of knowledge as an integral part of their validation process. N-GAMS operationalized gender awareness into just two attitudinal components: *gender sensitivity* (14 items; e.g. *in non-sex-specific health disorders the sex/gender of the patient is irrelevant*) and *gender role ideology* towards patients (11 items; e.g. *female patients compared to male patients have unreasonable expectations of physicians*) as well as towards doctors (8 items; e.g. *male physicians put too much emphasis on technical aspects of medicine compared to female physicians*). All scales were measured in a 5-point Likert scale raging from 1= *strongly disagree* to 5=*strongly*. Despite the scale's focus on both attitudinal components of gender awareness, nine items were developed in order to measure *knowledge* (e.g., *read the statement. Is it true or false? In women, a depression is more often masked by alcohol abuse than in men.*) but they were not part of the process of N-GAMS development and validation. The N-GAMS psychometric properties were investigated with a sample of 393 Dutch students from health sciences and medicine courses. A principal component analysis showed a three-factor solution and final Cronbach's alphas were equal or above .80 for all subscales. Findings supported good constructs and criteria-related validity of the scale: (1) gender sensitivity and gender-role ideologies were negatively correlated; (2) male students held stronger gender-role ideologies than female students, and; (3) gender awareness was

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related to patient centeredness. N-GAMS may be used to evaluate graduate or postgraduate courses and specialist trainings and it may offer a baseline for assessment and reassessment to all who are implementing a gender perspective in medical education (Verdonk et al. 2008). In sum, both instruments – the GAI-VA and the N-GAMS – despite needing further validation studies, have shown reasonable psychometric properties and have support for research and intervention application purposes.

The four studies using other quantitative measures to operationalize gender awareness used: (1) a score of gender sensitivity to evaluate the results of a training program (#2); (2) study 4 used several single items to evaluate a gender intervention program (#4); (2) a tool composed of questions on gender issues (#7), and; (3) several items with a 100mm visual analogue scale about the importance of gender (#8). None of these studies explored the psychometric characteristics of these measures. In study 2, gender sensitivity was operationalized through a set of gender sensitive recommendations for three diseases (angina pectoris, depression and urinary incontinence; *e.g., GPs should consider sexual issues in the management of patients with incontinence, since incontinence is a risk factor for sexual dysfunction in men and women*, general gender recommendation for men and women with urinary incontinence), during a training program in order to increase GP's gender sensitivity. GPs were trained to put these gender recommendations in practice and coded their adherence to the gender recommendations as gender sensitive (=1) or not (=0). In study 4, several theoretical tutorials about gender issues (*e.g.*, gender and cardiovascular diseases/urinary incontinence), were developed by GPs with expertise and committed to gender issues and implemented in a 3-year training programme for GPs and evaluated by them. After the implementation of the program, the GPs were asked to evaluate it

with five to seven statements expressing their opinion about the learning itself but also about the teaching methods, rated on a scale from 1-5. Answers were dichotomized so a response of 1, 2, or 3 suggested a negative evaluation of the program and a response of a 4 and 5 express an acceptance of the program. In study 7, 15 questions of which 10 directly related to gender issues were developed to assess and stimulate and increase physicians' awareness of gender and intersectional processes in clinical assessment of pain patients. For instance, the questions *Do we consider pain among men as more severe than among women?* operationalized sensitivity but also beliefs and stereotypes towards men and women. Finally, in study 8, the extent to which healthcare professionals agreed with five statements about the importance of gender (e.g. *The patient's gender is of importance in consultation)* was assessed on a 100mm visual analogue scale ranging from (1) "I do not agree at all"=1 to "(5) I agree completely".

Finally, as for the studies that assessed gender awareness or its related concepts with qualitative methodologies, on study 3, the data was analyzed by a deductive content analysis using theory-based methods, performed to generate facilitators and barriers to gender sensitivity. In study 10, the data were analyzed according to the principles of constant comparative analysis and three main explanatory themes regarding gender awareness were identified: insufficient knowledge, unawareness, and minor impact. Finally, in study 12, a discourse analysis and a thematic analysis were carried out to analyze the obstacles for gender mainstreaming in medical education.

In sum, most studies have used one of two instruments to measure gender awareness: the GAI-VA and the N-GAMS. However, other types of measures like checklists, questions and items, were also specifically developed to measure gender awareness or related concepts.

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How does gender awareness relate to health outcomes?

None of the studies included in this review provided an answer to this question. Studies were different with respect to their goals, methods, and findings but the relationship between gender awareness and various health indicators was not tested. Instead, some studies (#2, 4, 5, 6, 14) focused on the implementation of interventions or training/teaching programs to establish or increase gender awareness (or gender sensitivity; # 2, 4). In these studies, the main goal was to understand how programs or interventions increased gender awareness or gender sensitivity (#2, 4, 5, 6, 14), to compare programs/interventions (# 5, 6), or to assess a possible increase of gender awareness over time (#5, 6, 14). Results showed that gender sensitivity could be increased among healthcare professionals (#2), and that they recognize their sensitivity to the importance of gender issues (#4). Programs' efficacy in increasing gender sensitivity (#6, 14) and knowledge (# 5, 14) was assessed and ensured, but these effects did not necessarily last over time (#6). However, none of the studies revealed evidence about the potential influence of gender awareness on patients' health-related outcomes or quality and equity of provided health care (*e.g.*, diagnoses, treatments).

Discussion

This study aimed to understand how gender awareness has been conceptualized, operationalized and whether support has been found for its relationship with health-related outcomes. A discussion and critical analysis of the main trends and gaps for each one of these three topics is presented in first three subsections below. Drawing upon this critical analysis, the last subsection, besides discussing the limitation of this study, we propose a revised gender awareness conceptualization and operationalization as to inform novel research on its association with gender bias in health and health care.

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What does it mean to be gender aware after all?

Regarding the conceptualization of gender awareness, only 6 out of the 14 included studies drew upon Miller et al.'s (1999) model to conceptualize gender awareness in two or three interrelated dimensions - *sensitivity, ideologies* (*#1, 6 and 11*) and *knowledge (#9, 13 and 14*). This shows the lack of theoretical depth that has been given to the concept. Specifically, what these studies show is that there is no established 'identity' of gender awareness within psychological models, which jeopardizes its research and, consequently, intervention development efforts. Moreover, only about a quarter of the studies addressed *knowledge* as a relevant dimension that should be conceptualized as an integral part of gender awareness. Gender awareness is a complex construct involving attitudinal components such as *sensitivity* and *ideologies* and a factual component of *knowledge* (Miller et al. 1999; Verdonk et al. 2008). The results found in this *scoping review* regarding the conceptualization of gender awareness, may be related to the inherent difficulty to incorporate such different components in just one construct.

Reflecting the weak theorizing of the concept, study 2 vaguely defined gender sensitivity, study 3 vaguely defined gender awareness as a subdimension of gender sensitivity and other six studies did not explicitly define gender awareness (#4, 5, 7, 8, 10 and 12). Although most studies included in this review did provide a definition of gender awareness, inconsistencies were found in the conceptualization of the construct. Accuracy and uniformization would be helpful in the conceptualization of gender awareness and its theoretical roots. Indeed, related to the conceptualization of gender awareness one main issue should be pointed out, namely, the confusion between gender awareness and gender sensitivity.

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As previously described, there are three different types of misunderstandings in the conceptualization of gender awareness and gender sensitivity. First, providing a vague definition of gender awareness or gender sensitivity without clarifying what the concepts entail. Second, the two concepts - gender awareness and gender sensitivity - are used interchangeably. Third, the absence of an explicit definition of gender awareness but the use of related concepts which caused further confusion (*e.g.*, "gender sensitive care" or "gender- sensitive doctor-patient communication"). Gender awareness as a psychological and hypothetical construct derives its scientific value from the shared meaning it represents, and whether the construct is clearly articulated in the literature. Moreover, a clearly defined gender awareness concept may become a useful tool that facilitates the understanding of gender issues in health research and in medical education. However, the existence of conceptual confusions between the concept of gender awareness and gender sensitivity may currently be hampering the heuristic value of these concepts. Regarding these misunderstandings between gender awareness and gender sensitivity, our vision is in line with the one proposed by Miller et al. (1999) that argues that being sensitive to gender issues is just one dimension of being gender aware

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Gender awareness measurement: Do we really *know* what we're measuring?

In turn, the operationalization of gender awareness reflects a variability of procedures, from developed and validated self-report instruments (GAI-VA, #9, 13, 14 or N-GAMS, #1, 5, 6, 11) to less studied measures (#2, 4, 7, 8) and includes the use of qualitative methodologies (#3, 10 and 12). Just half of the studies included in this review assessed the construct by using instruments specially developed and validated to measure gender awareness (GAI-VA and N-GAMS). If we consider that the GAI-VA is

a highly specific tool (focused on the health of VHA females), we conclude that the N-GAMS is the only instrument developed so far to address gender awareness as an intra-individual attribute of healthcare professionals. The other half of the studies developed specific measures tailored to their study goals. The diversity of such operationalization strategies in part reflects the inherent difficulties in the conceptualization of gender awareness. Moreover, being such a broad concept including attitudinal, knowledge and behavioral components, its proper operationalization could only be accomplished through the triangulation of several measures. Indeed, only the triangulation of measures may allow assessing the dimension of competence of the gender awareness concept in full. Partly, this competence is conceptualized through *gender sensitivity* (Verdonk et al. 2008), which refers to being sympathetic to sex and gender issues and being capable of addressing them in clinical practice. However, the developed instruments so far (GAI-VA and N-GAMS) can only tap into (some) attitudinal and stereotypical dimensions of the concept. So, as to assess the complexities of gender awareness as a competence, besides the existing self-report measures, tests could be used to assess knowledge and, e.g., observational systems could be used to assess clinical skills.

It should also be noticed that assessing the *knowledge* components also has its challenges. *Knowledge* may be a difficult component to operationalize because it means specific and accurate information about gender issues on a disease (Miller et al. 1999). In the studies included in the present review *knowledge* was defined as accurate information about the needs, trends and policies regarding female patients and services available for them inside the Veterans Health Administration (based on Miller et al. 1999; Salgado et al. 2002). This definition illustrates very well the specificity that *knowledge* must achieve. One of the issues that may account for the fact that most

studies did not explicitly assess knowledge is precisely this specificity. Indeed, most studies included in this *scoping review* focused on the incorporation of gender issues in health and illness in general, instead of being focused on one specific health condition or disease. Nonetheless, *knowledge* as an explicit component should be considered in the operationalization of gender awareness as a competence, as it is intimately interrelated with the other aspects of gender awareness. For instance, Miller et al. (1999) pointed out that *doctors' gender* sensitivity and/or gender role ideologies may influence how doctors seek and evaluate factual information to consider a diagnose, or to provide adequate treatment or services. This suggests that the three components *gender sensitivity*, *gender ideology*, and *knowledge* are interrelated. Healthcare professionals need *knowledge* to be gender aware, but they also need to be gender aware enough to find knowledge acceptable to their practice. Conversely, the search for this specific *knowledge* will only be undertaken if they are aware that gender issues really matter to clinical practice.

Finally, there were some studies that did not seem to measure gender awareness. For example, study 4 conducted an evaluation of a gender program composed by five tutorials about gender issues (*e.g.*, gender and CHD) but it did not include a measure of gender awareness to test the effectiveness of the program. Moreover, in some of these studies there was a complete lack of information on the psychometric characteristics of the measures used.

Is gender awareness associated to health-related outcomes?

Regarding our third question, we did not find studies that provided evidence for the relationship between gender awareness and health-related outcomes – indeed, that relationship does not seem to be studied. Despite an extensive literature suggesting that

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gender awareness might have a potential effect on targeting gender biases in healthcare (e.g., Verdonk et al. 2008; Verdonk et al. 2009, Verdonk, Benschop, de Haes, Mans, and Lagro-Janssen 2009), this contention does not seem to be directly supported by empirical evidence. The previously highlighted conceptualization and operationalization problems may be a potential barrier for gathering evidence on the relation between gender awareness and health outcomes. Moreover, sex and gender are neither simple nor single issues (Hankivsky 2012; Karkazis 2019) - multiple other social identities affect people's lived experiences and these social identities 'color' each other (e.g., socioeconomic status (SES), race; Verdonk, Muntinga, Leyerzapf, and Abma 2019). Doctors' high levels of gender awareness can still be insufficient to target bias, when they do not consider other aspects of diversity (Hankivsky 2012), e.g., beingan older woman is associated with different health experiences than being a younger woman, a woman of color, a woman with a migrant background. These experiences are grounded in structural and historical yet unique biosocial locations with distinct privileges and disadvantages that have consequences for health and health care (Verdonk et al. 2019). Hence, the larger competence of 'gender awareness' incorporates *how* health providers understand sex and gender (as fixed or fluid categories), *what* knowledge is true (e.g. in decision making processes), *when and where* (e.g. at the consultation, urgency, etc.), and under *which conditions* (e.g. men and women's other social identities, their contexts), as well as *how* health providers' social identities affect the provision of health care (e.g. reflexivity towards personal assumptions, beliefs, or stereotypes about the presentation of complaints at consultation room by women or men across their diverse backgrounds – age, 'race', migration background, etc.).

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Limitations and Contributions for Future Research

Some limitations may be pointed out to this review. In a *scoping review*, the included papers are not subject of quality assessment, which holds a potential for bias. Moreover, the problems previously highlighted in conceptualizing gender awareness may have in themselves hampered the methodological search strategy used in this *scoping review*. Although we have conducted a review with two search strategies as to identify most relevant papers, our findings show that several similar concepts are used in the literature including "gender-sensitive care", "gender sensitive doctor-patient communication", "gender sensitive consultation" that are very often confused with gender awareness.

This *scoping* review has provided an overview on how gender awareness has been conceptualized, operationalized, and investigated in its association with health-related outcomes. Given the previously described patterns of trends and gaps in the literature, we suggest some recommendations for future studies to improve gender awareness research and intervention. In line with Miller et al.' (1999), our first recommendation regarding the conceptualization of gender awareness is that it should include its three components: *gender sensitivity, gender ideologies* and *knowledge* (Miller et al. 1999; Verdonk et al. 2008). However, we think that gender awareness must evolve into a broader concept that includes knowing, considering and integrating in clinical practice knowledge on sex and gender differences with respect to men, women, intersex as well as an understanding of gender diversity encompassing cisgender, transgender and nonbinary individuals, patients and doctors, across other aspects of diversity such as class, 'race', or age (Verdonk et al. 2019). The concept should therefore be adapted to the specificities of health contexts from an intersectional perspective (Hankivsky 2012) and include relevant stereotypes and knowledge. It

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should be noted that *gender sensitivity* encompasses two distinct attitudinal components: 1) considering sex and gender issues when relevant (being sensitive to consider gender issues) and; 2) addressing them into their clinical practice (being sensitive to address gender issues). Second, it is important that further studies produce more specific *knowledge* about the influence of sex and gender regarding some diseases. This could be helpful to legitimate knowledge as a relevant component of gender awareness but also for its appropriate operationalization. Therefore, *knowledge* must be properly introduced and evaluated into medical curricula and in gender awareness assessment and intervention programs (Verdonk et al. 2009; Zelek, Phillips, and Lefebvre 1997; Ludwig et al. 2015). It is our contention that these could be important steps towards a broader understanding and implementation of gender awareness in health care. In addition, adequate operationalization of gender awareness can only be achieved through triangulation of measures. Hence, it is necessary to develop tools and instruments to assess, or observe, *how* healthcare professionals are sensitive to address and integrate gender issues into their clinical practice. Also, as sex and gender do not play the same role in all the contexts and all cultures, further validation of the GAI-VA and N-GAMS for other cultures is one way to improve these measures and consequently, the operationalization of gender awareness. Finally, future studies should focus on healthcare professionals' gender awareness in relation to health outcomes, for instance by relating gender awareness to a specific illness or health issue and by incorporating an intersectional approach (e.g. Hankivsky 2012; Hankivsky, Doyal, Einstein, Kelly, Shim, Weber, and Repta 2017).

In sum, the results of this *scoping review* allowed to clarify the theoretical underpinnings of gender awareness conceptualization, operationalization and their relation with health-related outcomes. This scoping review should not be seen as an end

in itself but as a starting point for future studies and research, being relevant to researchers but also to provide guidance to physicians, directors, policy makers, and other healthcare professionals interested and concerned about gender awareness in health. The main contribution of this *scoping review* was to provide (a) a clear picture of how this construct has been studied, and (b) clues for future research and intervention purposes. Sex/gender should no longer be underestimated as a health determinant and evidence is needed to support the positive implications of gender aware healthcare professionals and practices.

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Figure 1. Flowchart diagram based on PRISMA Statement 2009

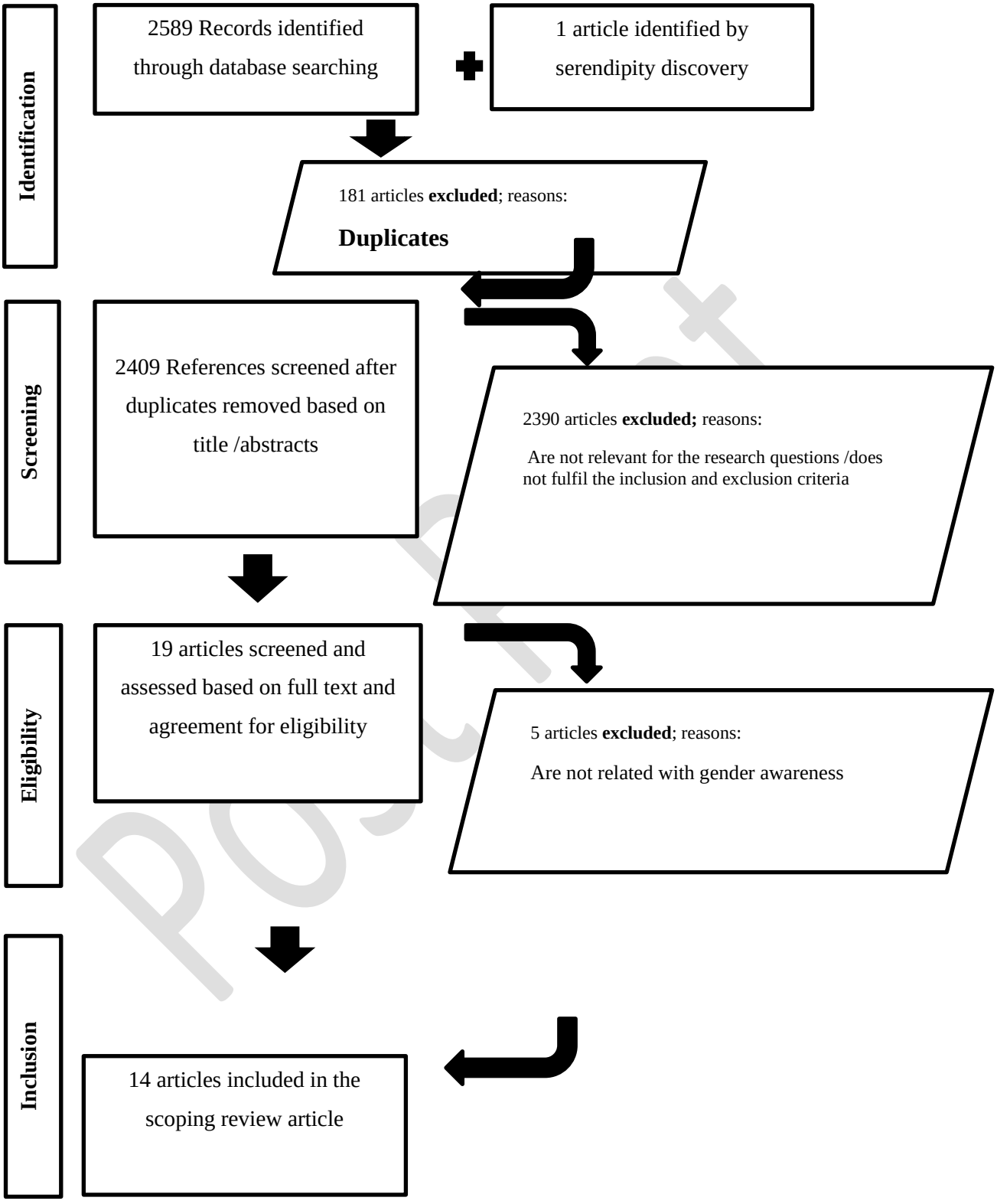

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Table 1. *Matrix* of Reviewed Studies

ID	Author(s) and year of publication	Setting	Main Aims	Gender awareness Conceptualization	Participants	Methodology	Gender awareness operationalization	Main Findings
1	Andersson, Verdonk, Johansson, Lagro-Janssen and Hamberg. 2012.	The Netherlands-Radboud University Nijmegen Medical Centre /Sweden - Umeå University	Compare attitudes towards gender and gender stereotyping between Dutch and Swedish male and female medical students.	Gender awareness means that physicians have the knowledge and competence to recognize and include gender as an important determinant of health and illness into their daily practice. It is also being aware and reframing stereotyped assumptions and beliefs about men's and women's behaviors, skills, and needs.	480 Swedish first-year medical students (54% females) and 616 Dutch first-year medical students (68% females)	Quantitative Cross-sectional – Self-report measures (*Nijmegen* Gender Awareness in Medicine Scale (N-GAMS) and socio-demographic characteristics)	N-GAMS with three sub-scales: *gender sensitivity* (14 items), *gender role ideology* towards patients (11 items) and towards doctors (7 items). The 32 items were answered in a five-point Likert scale.	Swedish and Dutch students differed in *gender sensitivity* (Dutch were more gender sensitive) *gender role ideology* (Swedish stereotyped less). Male students in both countries agreed more with stereotypical statements than female students.
2	Celik, Klinge, van der Weijden, Widdershoven and Lagro-Janssen. 2008.	The Netherlands - Radboud University	Analyze whether GPs' gender sensitivity can be increased by a training programme	Gender sensitivity was defined instead of gender awareness. Gender sensitivity means sensitivity to gender issues on the clinical decision processes.	9 experienced GPs (8 men and 1 woman) and 9 GPs in their third year of training (2 men and 7 women. One experienced GP was paired with GP in training.	Quantitative - A training program with gender sensitive recommendations for angina pectoris, depression and urinary incontinence was developed and implemented. GPs filled in registration forms for 100 patients.	A score of Gender Sensitivity in all registration forms were coded to measure the effects of the program.	Gender sensitivity can be stimulated among trained professionals. On average, GPs applied two out of three recommendations to all patients. More registration forms were completed for female than for male patients for the three conditions.

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3	Celik, Lagro-Janssen, Klinge, van der Weijden and Widdershoven.2009.	The Netherlands - Radboud University Nijmegen and Maastricht University Medical Centre	Identify the facilitators and barriers perceived by GPs to maintain a gender approach in family practice.	Gender awareness is the acknowledgement and understanding of gender questions by professionals.	9 pairs of GPs (11 male and 7 female)	Qualitative - Nine semi-structured interviews were used to collect the data The data was analyzed by a deductive content analysis using theory-based methods.	Does not apply.	Gender awareness, repetition and reminders, motivation triggers and professional guidelines were found to facilitate gender sensitivity. Lacking skills and routines, skepticism, heavy workload and the timing of implementation were found to be barriers to gender sensitivity.
4	Dielissen, Bottema, Verdonk and Lagro-Janssen. 2009.	The Netherlands	Describes the development and a pilot evaluation of a teaching program in gender specific medicine for GPs training.	Not reported	The training programme was developed by four expert GPs. The evaluation of the programme by 286 female and 145 male GPs Registrars (plus 11 that did not report their sex).	Quantitative – The training programme was composed by five tutorials about gender issues (e.g. gender and cardiovascular diseases/urinary incontinence) and the evaluation of each (including the learning methods) of them was made through agreement with five to seven statements.	Five to seven statements (Likert scales of five points) to evaluate the program.	GP registrars evaluated the course positively. No significant sex differences were found in programme evaluation but tendentiously female registrars valued the programme higher. In their formulation of own learning points, registrars affirm their understanding of gender in health.
5	Dielissen, Verdonk, Wieringa-de Waard, Bottema and Lagro-Janssen. 2014.	The Netherlands	Compare the change in GPs trainees'	Not reported	Three groups of trainees: 75 in a modular cohort, 72 in a mainstream	Quantitative - Two gender medicine	N-GAMS and a 16-item gender *knowledge* questionnaire	Significant Difference along time in gender *knowledge* scores between the

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			gender awareness following a modular gender medicine program vs. a mainstream gender medicine program.		cohort and 60 in a control cohort (139 female and 65 male GPs Trainees) at two different times, T1 (2007) and T2 (2010-2011).	teaching methods were compared: a modular approach (n = 75; five tutorials with specific gender issues by a biopsychological perspective) versus a mainstream approach (n = 72; traditional courses included gender issues based on a biomedical perspective). Both teaching methods were compared with a control cohort (n = 60). N-GAMS was used to assess Gender Awareness and a 16 questions to assess Knowledge		modular cohort (highest score), compared with the mainstream and control cohorts respectively. No significant differences between cohorts on *gender sensitivity* and *gender-role ideology*. Females revealed significantly higher gender awareness than males, but the latter were not unaware.
6	Eisenberg, Dahlstrom, Neeman, Carnovale and Ellwood. 2013.	Australia - Australian University	Assess the effect of Women's Health (WH) rotation (intervention	Gender awareness is the collective term for *gender sensitivity* (competence to recognize and adapt gender differences	30 students undertaking the 8 week WH rotation' and 33 students undertaking the senior medicine	Quantitative - Pretest-posttest with completion of N-GAMS . The N-GAMS were introduced	N-GAMS	Students receiving a WH teaching program had a higher level of *gender sensitivity* when compared to those who do not receive this

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			about female reproduction, clinical practices of obstetrics, gynecology, etc.) on final year students' level of Gender Awareness.	without resorting to negative stereotypes) and *gender-role ideology* (perceptions and acceptance of stablished stereotypes).	and surgery (SMS) rotation	at two times (one week before and 8 weeks after the beginning WH rotation and 2 weeks after the beginning of SMS rotation). The only socio-demographic characteristics considered in this study were sex and rural stream involvement.		program. However, seven weeks later there were no significant differences between the groups when sex differences were taken into account. There were no differences between groups in *gender role ideology* in either of the two times.
7	Hammarström, Wiklund, Stålnacke, Lehti, Haukenes and Fjellman-Wiklund. 2016.	Sweden – Pain Rehabilitation Clinic at Umeå University Hospital	Develop a tool for increase awareness of gendered and intersectional processes in clinical assessment of patients, based pain rehabilitation case.	Not reported	595 women and 266 men in quantitative analysis and 10 patients, 7 healthcare professionals in pain rehabilitation and 8 GPs and their trainees working at one primary health care center in Umeå for qualitative analysis	Mixed – Self-administered questionnaires in quantitative analysis and individual semi-structured interviews and focus group for qualitative analysis	A tool composed by 15 questions (10 of these 15 questions are directly related to gender issues, i.e., gender sensitivity, stereotypes and specific knowledge about pain problems in men and women)	A tool composed of 15 questions was developed to assess and select patients for pain rehabilitation. Men were more often referred to physiotherapy and x-ray than women, regardless sel-reported pain intensity, pain activity and pain localization. Higher pain scores were not related to selection to multimodal rehabilitation. The higher scores of pain, the less likely women were referred to rehabilitation.

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8	Risberg, Hamberg and Johansson. 2003.	Sweden - Swedish University	Analyze whether (and how) gender in different medical relationships varies with physician sex and specialty and explore how might this be related to working climate and segregation of women and men in various medical specialties.	Not reported	468 specialists in clinical departments of the university hospital and in family medicine. 333 male and 135 female physicians	Quantitative – cross-sectional, Self-report measures (items about importance of gender and socio-demographic measures)	Five items about the importance of gender consisting of statements to agree or not agree with on a 100mm visual analogue scale. Open-ended questions below each statement were done.	There were differences in the importance given to gender between all specialty groups mainly due to disparities among men. The probability for a male family physician to assess gender as important in professional relationships were three times higher, and for a male non-surgical doctor two times higher when compared to a male surgical doctor. Female teachers assessed gender as important to a higher degree than male teachers. Among women there were no significant differences between specialty groups.
9	Salgado, Vogt, King and King. 2002.	USA -Veterans Health Administration	Developing a reliable and valid method to measure Gender Awareness focused on female's veterans	Gender awareness is composed of the three interrelated components of *gender-role ideology* (stereotypes), *gender sensitivity* (sympathy towards female health care needs) and *knowledge* (accurate	Health-care workers (an average of 60% female health-care workers in all the steps of instrument development)	Quantitative, Cross-sectional, self-report measures	Gender Awareness Inventory-VA (GAI-VA) is composed by scales to assess *ideology*, sensitivity and *knowledge*).	GAI-VA is composed by three subscales, 29-item sensitivity measure; a 20-item ideology measure and a 20-item knowledge measure. In a series of psychometric inquiries, evidence for reliability and validity

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				information regarding female patients).				was generally established. The internal reliability for 29-item sensitivity was .83, for ideology was .87 and for knowledge was .67. Convergent and discriminant validity was stablished correlating GAI-VA with general measures of gender-role ideology and social desirability. Also, criterion validity was assessed through vignettes assessing health-care judgements related to female patients.
10	van Leerdam, Rietveld, Teunissen, and Lagro-Janssen. 2014.	The Netherlands - Radboud University	Analyze whether gender medicine has been taught in daily practice during clerkship	Not reported	29 students who finished medical/surgical clerkship (15 females and 14 males)	Qualitative – Focus groups were carried out in order to understand how gender issues were present in daily practice during clerkships The analysis were analyzed according the principles of constant comparative analysis.	Does not apply.	Gender differences were barely discussed during the clerkships. Three main explanatory themes: insufficient knowledge; unawareness; and minor impact of gender issues. Students feel that they have not sufficient competencies to become gender-sensitive doctors.

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11	Verdonk, Benschop, De Haes and Lagro-Janssen. 2008.	The Netherlands - Radboud University Nijmegen Medical Centre	Developing a reliable and valid method to measure Gender Awareness	Gender awareness includess two attitudinal components: *gender sensitivity* (ability to perceive existing gender differences, issues and inequalities and incorporate these into strategies and actions) and *gender role ideology* (health care worker's attitude towards male and female patients and doctors)	280 women and 133 men Medicine students	Quantitative – N-GAMS with several change steps	N-GAMS	N-GAMS is composed of three subscales, gender sensitivity (14 items, gender role ideology towards patients composed by 11 items and gender role ideology toward doctors composed by 7 items. Reliability and validity were recognized. The internal reliability for 14-item measure was .80, for 11-item measure .85 and for 7-item measure .80. Content validity was supported by the three components and construct validity was assessed and partially stablished testing three specific hypotheses in study.
12	Verdonk, Benschop, de Haes, Mans and Lagro-Janssen. 2009.	The Netherlands	Discuss and compare answers of Education directors and change agents related to the gender mainstreaming in medical education	Not reported	7 women and 11 men Education directors (in their faculties) and change agents (i.e. change agents worked in the educational institute or chaired a curriculum committee and had a coordinated	Qualitative - Eighteen semi-structured interviews. A discourse analysis and a thematic analysis were carried out order to analyze the gender mainstreaming in	Does not apply.	Obstacles for gender mainstreaming in medical education were implicit in four themes: (1) biomedical knowledge was perceived to be gender neutral; (2) the importance of gender was downplayed, particularly in comparison with

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					project within the faculty)	medical education		culture/ethnicity; (3) social accountability was hardly mentioned and gender inequalities in health was framed as feminist political issues and not medical issues; and (4) the communication with staff, students and other relevant people must be careful to increase acceptance and avoid overt resistance.
13	Vogt, Stone, Salgado, King, King and Savarese. 2001.	USA – Veterans Health Administration	Assess Gender Awareness of Veterans Health Administration employees and analyse how demographic characteristics are associated with the levels of Gender Awareness	Gender awareness is composed of the three interrelated components of *gender-role ideology* (stereotypes), *gender sensitivity* (sympathy towards female health care needs) and *knowledge* (accurate information regarding female patients).	622 VHA employees across New England Region 64% female participants with direct patient contact (e.g. physicians, nurses, technicians, and other professional and nonprofessional groups who deliver health care) and ancillary patient contact (e.g. clinic receptionists and clerks)	Quantitative, cross-sectional, self-report measures	GAI-VA	High levels of Gender Awareness overall. Generally, 83% of VHA workers held positive stereotypes towards female patients, 86% are aware and sympathetic towards the unique needs and requirements of female patients and related to knowledge, VHA workers are more varied. For instance, 84% knows the women's health-care guidelines but just 37% knows about women's VHA care utilization. Female VHA workers scored significantly

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								higher than VHA male workers on ideology ($t(605)= 5.07$; $p<.001$) and sensitivity ($t(605)= 2.60$; $p<.001$). Related to demographic variables, only education was significantly and positively related with the three components of Gender Awareness.
14	Vogt, Barry, and King. 2008.	USA - Veterans Affairs health-care setting	Improve health care workers' Gender Awareness through the application of a brief computerized educational intervention	Gender awareness is composed of the three interrelated components of *gender-role ideology* (stereotypes), *sensitivity* (sympathy towards female health care needs) and *knowledge* (accurate information regarding female patients).	231 participants at T1 (questionnaire assessing Gender Awareness and other characteristics), 167 participants at T2 (Gender Awareness program) and 107 participants at T3 (Gender Awareness reassessment). Of the 169 participants that completed at least two time points 158 (89 women and 69 men) has at least sufficient data to compute gender awareness scores. Participants with direct patient contact (e.g.	Quantitative - Pretest-posttest equivalent control group design with GAI-VA	GAI-VA	Significant improvements in *gender sensitivity* and *knowledge* for participants in the treatment condition compared to the control condition. With several exceptions, the intervention was similarly effective across employee groups.

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	physicians, nurses) and ancillary patient contact (e.g. lab technicians, receptionists).