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Gender Inequality in Pain Management

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BACHELOR'S THESIS
October 2023

Degree Program in Nursing

ABSTRACT

Tampereen ammattikorkeakoulu
Tampere University of Applied Sciences
Name of the Degree Programme

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Gender Inequality in Pain Management

Bachelor's thesis 36 pages, 10 appendices pages
October 2023.

The purpose of this thesis was to conduct a literature review on how gender inequality plays a role in pain management in healthcare. The objective was to describe how inequality presents itself by identifying typical disparities in treatment of pain among male and female patients. Essentially, this study aims to bring awareness to existing controversy of gender bias when administering pain management.

This study was conducted as a qualitative literature review. The data was acquired from PubMed and CINAHL using different combinations of specific search terms. Finally, eleven articles were selected and analysed for this study using thematic analysis method.

The results of the analysis demonstrated that pain among female patients was more likely to be underestimated by healthcare providers and are more likely to be inadequately treated than male patients. The results also suggest that pain among female patients is more likely to be considered a mental health problem than in males. Results also highlighted the fact that gender bias in medical pain management is an issue that needs more research and recognition.

It is advisable to conduct further research and studies to provide updated and contemporary insights into gender bias in medical pain management. While the experiences of women in this context are current, the existing body of research has not kept pace with recent developments. This study specifically concentrates on examining gender bias in medical pain management within the geographical scope of the United States of America, European Union member countries, and Israel.

Keywords: Gender inequality, gender bias, pain management, healthcare setting

CONTENTS

1 INTRODUCTION

Pain treatment is one of the most common issues we face in healthcare settings. However, it seems that the treatment of pain between patients often differs according to several factors. In this thesis we specifically want to focus on medical treatment of pain and the different treatment of patients due to their biological sex and/or perceived gender. In order to keep a clear focus on our chosen topic, in this thesis we will only consider male and female sexes/genders and will not be examining the bias all the different types of genders may face in pain management. We aim to conduct this review impartially.

Gender equality is important in all aspects of life, especially when it is regarding treatment in hospitals, or other healthcare settings. Gender should never be a factor when considering how well someone tolerates pain and how seriously it is treated. For example, stereotypically women may be seen as emotional, dramatic, hysterical, weaker than men, or hormonal and men on the other hand may be seen as strong, not allowed to show emotion or pain and having higher pain tolerance than women. (Billock 2018; Williams 2021.) Then again, some people would argue that because women go through child labour and have intense period cramps, the pain that men experience is nothing compared to that. Neither of these stereotypical beliefs should be acceptable to have when working as a medical professional (or at least if it influences the quality of care). Unfortunately, the problem of gender inequalities is still an unrecognised problem in the field of healthcare. When a patient says they are in pain the medical provider should first believe the patient and then treat it accordingly. Every patient should be perceived as an expert of their own life and treated respectfully as an individual. In this thesis we illuminate the issue of gender bias in medical pain management in healthcare settings.

2 THEORETICAL STARTING POINTS

2.1 Gender Bias and Gender Inequality

Gender bias pertains to an individual experiencing disparate treatment due to their actual or perceived gender. (Wex definitions team 2020.) It is a form of unconscious or implicit bias. Some can unintentionally allocate certain stereotypes to the male or female sexes. Gender inequality is defined as any discrimination of someone based on sex/gender which causes one gender to be favoured over another. (Save the Children n.d.) Gender bias in healthcare is an evidence based clinically iniquitous occurrence of the diversity in treatment and diagnosis among male and female. (Łyszczarz 2017.) We have limited our research to the biological female and male sexes and not the many different gender identities, as it would cause too broad of a topic and dilute our results.

While they are slightly different terms, gender and sex are often used interchangeably as they do intersect and connect to one another. Gender is a social construct of what societies beliefs and expectations are for the male and female role and/or their characteristics while sex is the biological anatomy and genetics that constitute female/male. (National Institutes of Health. Sex & Gender n.d.) We use the term gender in our title and text because we are setting the tone that the patient themselves and the healthcare workers are both aware of the patient's biological sex and the gender bias occurring is based off of the patients' biological sex or perceived gender.

2.2 Pain Management and Pharmacological Pain management

Pain management is defined as the part of medicine in healthcare that relieves /manages pain at different levels and dimensions using pharmacological, non-pharmacological and other methods. (Gale encyclopaedia of medicine 2008.)

Medical pain management or pharmacological pain management is the treatment of pain at different levels and dimensions using drugs and does not include alternative methods in pain management e.g., holistic approaches, psychological, mind and body, or therapies. (Altair Health n.d.) For the purposes of our discussion and research focus, we have narrowed our scope exclusively to medical or pharmacological pain management. This decision was prompted by the broad and diverse landscape of pain management approaches available, which, if all-encompassing, could dilute our research findings and lead to an overly extensive exploration of the topic. It is essential to note that not all differences in pain management are attributable to bias; some distinctions may arise from natural factors such as patient weight, age, or other individual characteristics.

2.3 Healthcare Settings

Healthcare setting is considered to be a wide range of facilities where healthcare is carried out such as hospitals, rehabilitation centres, urgent care centres, specialized outpatient facilities and nursing homes. (Christensen & Fagan 2018.) In this paper we will be dealing with only hospitals and urgent healthcare centres. We have chosen these facilities due to the staffing being comprised of doctors and nurses and the availability of a wider range and capability of using medical/pharmacological means of managing pain.

3 PURPOSE, TASKS, AND OBJECTIVES

The purpose of the thesis is to conduct a qualitative literature review about gender bias in medical pain management in health care settings. The objective of this thesis is to bring awareness to possible gender inequalities and underlying gender biases in pain management not only to healthcare workers but to patients themselves.

We intend to bring awareness to gender bias in pain management in healthcare settings and how it has not been researched enough recently by means of our thesis question. As previously mentioned, primarily, this thesis is directed to health care professionals, especially nurses, but it may be as well beneficial to the patient or their relatives. We hope to educate others about this issue of gender bias within the healthcare setting.

The research question we are going to answer is: How does gender bias in medical pain management present itself in the healthcare setting?

4 METHODOLOGICAL STARTING POINTS

This thesis has been conducted as qualitative descriptive literature review which is a systematic data collection process to acquire experience of a certain group of people. The idea of a literature review is to advance the knowledge on a specific topic by gathering and reviewing data from already existing literature. By reviewing the existing literature, it is possible to test out hypotheses, develop new theories and assess validity and quality of completed studies in order to reveal inconsistencies and gaps in knowledge in the subject matter. (Xiao & Watson 2019.)

The form of literature review used was descriptive. In descriptive reviews, each chosen study is seen as a unit of analysis and the existing body of literature provides a database from which the authors seek to identify patterns by focusing on certain characteristics in each study. Thereby, authors are able to draw conclusions about the findings of the selected studies. (Paré, Trudel, Jaana & Kitsiou 2015.)

In this literature review data has been collected from reliable databases, evaluated by their importance and value of benefit for our research, and finally reported in this thesis. (Xiao & Watson 2019.)

4.1 Data search process

The first phase of the data search process was to form a research question, that this thesis aims to provide an answer for. Our research question is phrased as follows: “How does gender bias in medical pain management present itself in the healthcare setting?”

In the literature search we used the PICO search strategy. PICO strategy, which stands for Patient/Problem, Intervention, Comparison, Outcome, helps to create a good clinical research question that support evidence-based findings. (Jensen 2018.) The literature search for the final articles was performed in February of

2023. We began our search by using various combinations of the following search terms some of which were from our original key concepts: “gender bias”, “healthcare”, “pain”, “pain management”, “patients”, “gender inequality”, “gender equality”, “gender disparity”, “analgesics”, “pain treatment”, “pain relief”, “managing pain”, “pain reduction”, “pain control”. While forming different combinations of the afore mentioned search terms, we additionally used the connectors “AND” and “OR” (see Table 1).

TABLE 1. Search terms.

Database	Search phrase	Limitations
CINAHL Pubmed	((gender equality) OR (gender inequality) OR (gender bias) OR (gender disparity)) AND (pain OR (pain management) OR managing pain) OR analgesics OR (pain treatment) OR (pain relief) OR (pain reduction) OR (pain control)) AND (healthcare OR patients)	Peer Reviewed Year: 2002-2022 Language: English

4.2 Inclusion and exclusion

We used a 20-year time frame instead of the suggested 10-year time frame due to the lack of sources that exist on our topic. We managed to limit our results to 273. After eliminating duplicates from each thesis author, we were able to cut the results in half. Manually, we went through the remaining results. By screening the titles, we could eliminate many articles for irrelevance to the topic and language used. We only included articles in our search with the following criteria: English language, geographically located in the U.S, Europe and Israel, 20-year time frame, adults between ages 18-65, healthcare setting, and pain managed by pharmaceutical means. In the final review eleven studies were included that answered our research question. These studies were published between 2002 and

2022 and the majority of them were conducted in the USA, but also in Switzerland, Sweden, Israel and United Kingdom. We found two sources from 2008, one from 2012, one from 2014, one from 2015, one from 2016, one from 2018, one from 2019, and one from 2021.

Initially there were articles that did not involve pharmacological treatment of pain, or they did not involve treatment in the healthcare settings, i.e., hospitals and healthcare centres, which our research is limited to. There were also articles which were eliminated being outside of our geographical limitations, The United States, Europe, and Israel. However, our initial geographic range was the U.S. and Europe, but due to the lack of relevant sources, we had to expand and add Israel. We specifically chose to add Israel since their healthcare system is well advanced by international standards and similar to that of western countries. (International Citizens Insurance n.d.) We were also able to eliminate those articles written outside of our designated age range of adults between 18–65-years of age, for example we eliminated all paediatric topics.

After these exclusions, we had 30 results remaining. Then, we considered the article type. Due to this thesis being a literature review itself we had to exclude all other literature reviews from the remaining 30 articles. We also reviewed the remaining research articles to evaluate if they fully answered our research question. In this process we were able to eliminate another 24 articles, leaving us with six research articles. Several studies were added from the references of some excluded literature reviews. This gave us the final number of 11 studies to proceed with to the analysis. The data collection process will be explained and displayed with the help of a PRISMA flow chart, as seen in Figure 1 Prisma flow chart. (Page, McKenzie, Bossuyt, Boutron, Hoffmann, Mul-row, Shamseer, Tetzlff, Akl, Brennan, Chou, Glanville, Grimshaw, Hróbjartsson, Lalu, Li, Loder, Mayo-Wilson, McDonald, McGuinness, Stewart, Thomas, Tricco, Welch, Whiting, & Moher 2021)

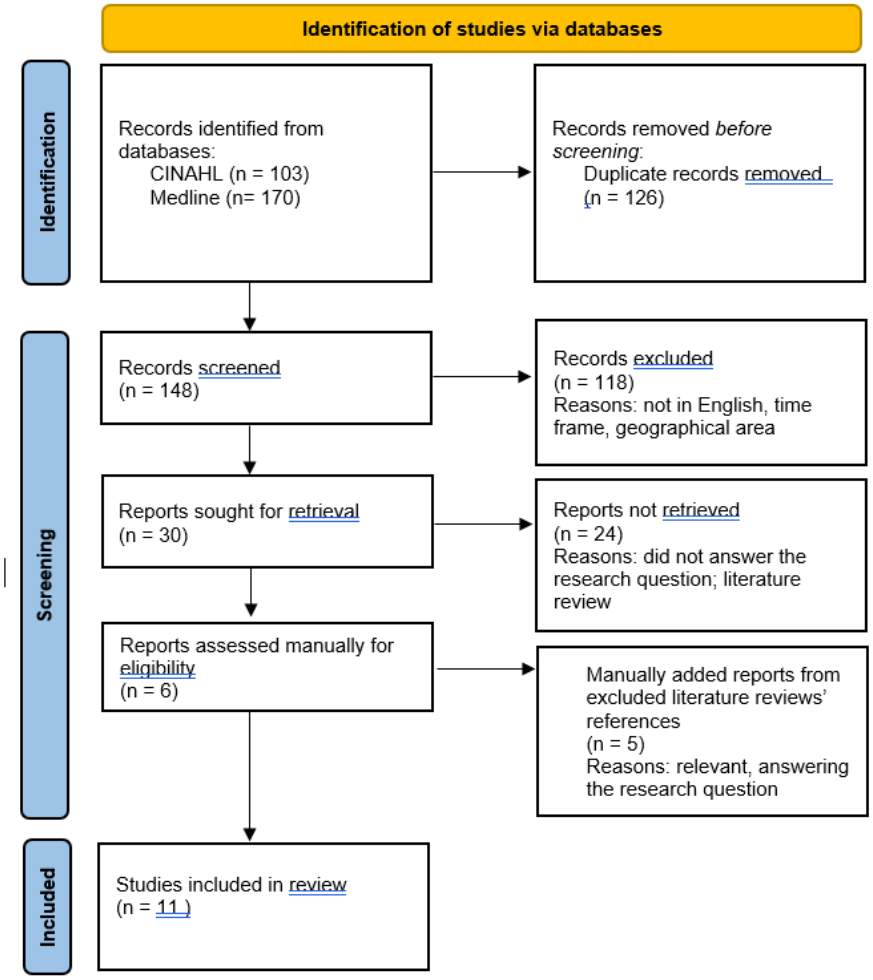

Figure 1. Prisma flow chart

4.3 Data analysis

Relevant to our research question, 11 were chosen (see Table 2 in the appendices for a full list of eligible studies). Four research articles specifically focused on examining pharmacological disparities, three articles researched providers bias, two articles studied the differences in pain treatment between sexes, and one article studied the possible socioeconomic aspects affecting administration of analgesia.

To carry out the analysis of the chosen articles and to better familiarize ourselves with the results, we decided to use the principles of thematic analysis. Thematic analysis is a good way to approach the topic of this thesis as it is often used to

identify patterns in the data when the research aims to understand what participants think, feel, and do by focusing on the lived experiences, views, perspectives, behaviours, and practices of people. It allows flexibility in the interpretation or analysing qualitative data. (Clarke & Braun 2017.) The aim of thematic analysis is to establish themes through patterns in the data to essentially address the overall issue of the research. (Maguire & Delahunt 2017.) The process of coming up with themes is called coding and the researcher's own judgement is needed to determine what a theme is. Each theme represents something significant about the content and therefore depicts a pattern in the data and provides description to the research question. (Clarke & Braun 2006.)

After thoroughly familiarizing ourselves with the data we made a table chart on which we added the original phrases from the results section of all the sources that specifically involved aspects of our research question. We then simplified the phrases by making reductions of the original text. By focusing o the similarities of all the results, we began coding. Based on the reductions we systematically connected these similarities, or repeated patterns, to each other after which we mapped out the relationship between the initial groupings in order to first form candidate themes/categories and eventually main- and sub-themes/categories. We then started gathering the findings in a coherent pattern under each related category/theme each of which providing an answer to our research question; *How does gender bias in medical pain management present itself in the healthcare setting?* After reviewing all the themes and some further modifications as well as making sure the content forms a consistent narrative about each theme, we focused on identifying the relevance and meaning of the data in relation to our research question. By doing so, we finished the final stages of thematic analysis and came up with a detailed write-up. (Clarke & Braun 2006.)

TABLE 3. Example of phrases and Categories. (Appendix 2 for full results)

Original Phrase	Reduction	Sub-Category	Category
They were more likely to provide optimal treatment for men with acute post-operative or cancer pain. (1)	Men were more likely to be treated for acute post op. and cancer pain. (1)	Pharmacological treatment	Biased decisions for further treatment

5 FINDINGS

Findings show that gender bias in medical pain management present itself in underestimation of women's' pain and biased decisions for further treatment. This overview of the findings is presented in Table 4.

TABLE 4. Findings from chosen sources.

How does gender bias in medical pain management present itself in the healthcare setting?	
Underestimation of womens pain	**Biased decisions for further treatment**
Differences in pain estimation Gender influenced trustworthiness of experienced pain	Increased waiting time to receive treatment Increased referrals and diagnoses for mental health disorders for women Insufficient pharmacological treatment of pain for women Gender biased further treatment referrals

5.1 Underestimation of women's pain

Based on the results of the analysis, underestimation of women's pain was apparent in two different aspects; differences in pain estimation and gender seemed to influence the trustworthiness of patients' experienced pain. These aspects presented as repeated patterns in the data appropriately describing subcategories from this main perspective.

5.1.1 Differences in Pain Estimation

Gender bias presented itself in differences in pain estimation by provider and patients. As for patients, women were more commonly reporting insufficient pain management (3). Providers on the other hand, whether a student or clinician, both were more prone to evaluate male patients' pain to be greater than that of females' pain (10). Differences between estimated pain and self-reported pain showed an overestimation of pain in males and an underestimation of pain in females (11).

The gender of the patients appeared to impact how reliable their pain estimates and expressions were (10). Men tended to have higher recorded VAS (Visual Analog Scale) scores for pain, and they were assessed more frequently compared to women (9). Interestingly, women who were perceived as less trustworthy tended to have lower pain estimates, while men in similar situations still gained higher estimates of pain (10).

5.1.2 Gender influenced trustworthiness of experienced pain

The perceived gender of the patient influenced the provider's estimation of trustworthiness of the patient and their level of pain. Among patients redeemed as "low trustworthy" there were differences between the two sexes regarding how their level of pain is perceived by the provider. Low trustworthy female patients were judged rather to exaggerate and less inclined to downplay or mask their level of pain. Male patients were rated less likely to hide or minimize pain regardless of their trustworthiness. Women were seen less likely to minimize or hide their pain. Pain exaggeration, minimizing and hiding ratings among female patients affected the participants (clinicians and medical students) pain estimates, whereas among male patients, it had no effect (10).

5.2 Biased decisions for further treatment

Gender bias in medical pain management was also apparent in biased further treatment decisions. Similarly, to underestimation of women's pain, there were also repeated patterns in the data regarding treatment decisions made by providers which served us five different sub-category titles each of which accurately describes the other aspect of the occurrence of bias. We recognized five viewpoints in this category; increased waiting time to receive treatment, increased referrals and diagnoses for mental health disorders for women, insufficient pharmacological treatment of pain for women, gender biased further treatment decisions, and finally, pain treated as a mental health problem.

5.2.1 Increased waiting time to receive treatment

Gender bias in wait time was seen in the healthcare setting. Differences in the patients wait time for treatment and examination were found in our results. Gender and VAS (visual analogue scale) scores had the most significant influence on the time interval between admission and patient examination (9). In addition, women had a longer wait than their male counterpart to receive medication they needed for their pain (1).

5.2.2 Increased referrals and diagnoses for mental health disorders for women

There were differences in mental health referrals and diagnoses made by male and female providers. Female providers gave female patients more mental health referrals than to male patients. Female providers gave more mental health referrals to nondepressed female patients than male providers (7).

When deciding for a patients' further treatment the sex of the patient was named as a factor which led to the decision of recommending or using antidepressants as a pharmacological therapy (8). This was especially visible with female healthcare providers that gave higher antidepressant ratings to their female patients (7).

5.2.3 Insufficient pharmacological treatment of pain for women

The female patient was less likely to get an adequate pharmacological pain treatment compared to the male patient. In many treatment decisions the patients' sex was an influential factor, (8) as women were less likely to receive statins, aspirin or opioids than men (1,4,9). For example, out of patients that needed surgical procedures for their abdominal pain less of women were given opioid analgesia than men (1). Additionally, providers that were influenced by patients' sex were also more likely to recommend/give opioids to male patients (8).

The number of drugs prescribed to men was higher compared to women (9) and male patients received more pain treatment than women (9). This included prescriptions of opioids or nonopioid analgesics, (10) even when women had a similar pain score (1). Men were more likely to be treated for acute post op. and cancer pain (5). While women were less likely to be taking high potency opioids, men had a higher average of total daily dose of morphine (3).

5.2.4 Gender biased further treatment referrals

Results indicated that patient's sex affected some providers treatment decisions (8). Investigation for the cause of the patients' condition was less frequently done for female patients in pain than for males (2). Men were more often referred for further laboratory testing (6), consultations with specialists like cardiologists or exams like ECG and troponins (2). Even when taking the patients age and cardiovascular risk factors, men received more referrals than women (2). Moreover, physical training recommendations were more likely to be given to male than to female patients (8).

Regarding laboratory test no difference could be seen between male and female physicians, as both ordered a larger extent for male patients (6). But the

healthcare providers gender had impact on the referral of female patients to a cardiologist, because male physicians were less likely to refer the female patient (2).

6 DISCUSSION

The findings of this research consistently demonstrated biased treatment of pain among female patients. The gender bias was presented as underestimation of women's pain by providers, female patients being more likely to receive inadequate analgesia, and the bias also affected further treatment decisions with female patients receiving less referrals and their pain being generally less examined than male patients'. Interestingly, the data was conflicting as to which gender of the provider had higher prevalence of bias against the gender of the patient. Therefore, the results remain unclear whether it is usually the female or male providers that typically would show bias towards patients' gender.

Although plenty of research has been done on whether gender related bias in pain assessments exist, the specifics still remain partly inconclusive. Many studies show sex-related biases against women in the treatment and estimation of pain. On the other hand, there are also studies showing biases against men and studies showing no biases regarding this topic. Bernardes and Lima argue that these inequalities in pain estimations may be related to the context of the pain experience. For example, how someone expresses pain and if there is diagnostic evidence of pathology meaning whether or not the symptom of pain is seen to be caused by a clinically ambiguous reason or a medically diagnosable condition. (Bernardes & Lima 2011.)

Sometimes when the cause of pain is unknown, it is attributed to a psychological origin which may lead some healthcare professionals to perceive it as less credible, harmless and the patient's clinical status as less severe. Bernardes and Lima found that, at least for the treatment of chronic lower back pain, pain without evidence of pathology and it being believed to be of psychological causes, female patients' pain is more readily seen as less credible and less disabling. (Bernardes & Lima 2011)

Topic related studies were difficult to find when considering a time frame that covers the last ten years. We had to expand our research period by another ten years to get a sufficient number of results that answer our research question. This lack of suitable findings shows that the topic of gender bias in pain management

seems not to be covered well enough. When doing our search, we found a huge number of studies from the 90s, but after that the interest in the topic seemed to decline again. There might be several possible reasons for neglecting this research topic, such as the inconvenience of the topic itself. When researching the topic, you might face your own gender bias. Another struggle is the fact that gender bias is difficult to approach and prove.

This literature review highlights a huge gap in research regarding gender bias in pain management. Not only studies are missing, but discussion about the topic is hardly existing.

Education to reduce gender-related bias for future healthcare workers could start during the studies. Even by simply bringing this subject to the attention of students that gender bias in medical pain management exists could help their future patients as well as their future co-workers. Creating the change from the student level of the healthcare profession sends a whole new group of nurses into the workforce with the knowledge and potential to be better for their patients and reduce the amount of gender bias in their workplaces. With proper education comes knowledge and awareness with the potential of applying that knowledge to everyday scenarios. (European Institute for Gender Equality 2017.) As for education for healthcare professionals who are already out in the workforce, hospitals typically have continuing education for their healthcare professionals to update them on new evidence-based knowledge and provide the faculty with any new updates in protocol. Often the ward manager or healthcare center manager will set up times for staff to sit in on a brief training of these updates or changes. In these further education trainings is where the education in gender bias could be implemented. (Mlambo, Silen, & McGrath 2021.)

History of gender inequality is well known in society. There has been and still is a lack of equality for women. There has been a time where women were treated for hysteria in the 19th century instead of real medical issues. (Smith-Rosenberg 1972.) Women were also not allowed in politics and unable to vote. Still today women deal with the gender pay gap where men working in the same position are making more money. (Quffa 2016.) Even as consumers women have what is called the pink tax which is a price based on ones gender for products that are

specifically marketed to women. (Guittar, S.G., Grauerholz, L., Kidder, E.N., Daye, S.D. & McLaughlin, M. 2022.) The most recent disparity between genders now regarding healthcare was the 14th Amendment in the United States of America, Roe vs Wade, being overthrown in the year 2022 which protects a woman's right to her own body giving her the right to an abortion. (Levinson-King 2023.)
It is not a far leap to be able to find gender bias in healthcare when women still suffer from inequality in their lives today.

There are many articles and literature reviews that show the existence of gender bias in the healthcare setting when it comes to being treated for pain. Women have shared their experiences of gender bias in management of their pain and trustworthiness in their knowledge of their own bodies. For example, a young woman called the emergency line and told of acute pain she was feeling and was not believed or treated in a timely manner. The unfortunate consequence was death. (Billock 2018.)

Physicians presented men as being `stoic`, tolerating pain or denying pain. Therefore, in the physician's assumption of men to be reluctant to admit their pain, when they do express pain, it is perceived as more serious. Women on the other hand were shown to be perceived as emotional, dramatic, hysterical, even fabricating their pain. So, rather than being treated for somatic pain they were more likely to be told they are suffering from psychological issues. (Samulowitz, A., Gremyr, I., Eriksson, E., & Hensing, G. 2018.) For example, orthopaedic surgeon came forward after recognizing her own bias in pain treatment towards women due to her own gender stereotyping. (Page 2017.) With this we are able to see a direct link to existing knowledge in society and a lingering issue for women in healthcare.

In this descriptive literature review we have examined gender bias in medical pain management in healthcare settings specifically with the intention of describing how this bias is displayed in practice. We also hope to increase the readers' awareness of its occurrence.

6.1 Ethics and reliability

In this thesis we are following the Finnish Advisory Board on Research Integrity's responsible conduct of research (RCR) guidelines (2012, 30.) All information was obtained from reliable and authentic sources. All collected data has been cited according to the guidelines. We have used reliable sources by evaluating if they were trustworthy using our assessment skills learned in theory. The findings were documented unbiased. (TENK 2012.)

This thesis is a public document, available for others to read and thus not confidential material. (ARENE 2020.)

Due to the lack of current studies regarding our research question we had to change our originally intended time frame of ten years and expand it for another decade. Our results now cover the years 2002 to 2022. This makes it certainly difficult to discuss the up-to-date situation of gender bias in pain management. We still decided to include the older studies, as in our opinion the level of research from 20 years ago doesn't differ much from the current one relating to the topic.

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APPENDICES

Appendix 1. Table 2. Description of eligible studies

#	Authors, year, country	Aim of the study	Method & number of participants
1	Chen, E.H. et al. 2008, USA	To study whether gender disparity is present in administration of analgesic medication for patients with acute abdominal pain	Prospective cohort study (981 patients, 65% female) of not pregnant adults that have acute un-traumatic abdominal pain that is under 72 hours in duration who came to an urban emergency department.
2	Clerc Liaudat, C. et al. 2018. Switzerland	To assess sex differences in the management of chest pain in ambulatory care	Prospective cohort study. 672 patients in 58 different primary care practices and 1 university ambulatory clinic. 352 women and 320 men.
3	Donovan, K.A., et. Al. 2008. USA	To determine whether sex was associated with pain severity and pain management in cancer patients newly referred by their primary oncology team to a multidisciplinary cancer pain clinic	Brief Pain Inventory-Short Form and medical chart review was conducted to obtain patients' clinical characteristics and pain treatment data. One hundred thirty-one cancer patients.
4	Enriquez, J.R. et al. 2008. USA	To determine the prevalence of ADRs associated with common CAD drug	A cohort of consecutive outpatients with CAD, detailed chart

		therapies in women and men in clinical practice.	abstraction was performed to determine the use of aspirin, E-blocker, ACE inhibitor, and statin therapy, as well as the ADRs reported for these treatments.
5	Green, C., Wheeler, J., LaPorte, F., Marchant, B. & Guerrero, E. 2002. USA	To provide quantitative data regarding the status of chronic pain management by Michigan physicians. To relate physician's goals for pain management to physician confidence, preferences, and satisfaction with their chronic pain care.	A prospective cohort study utilizing a survey with four chronic pain vignettes. Three hundred and sixty-eight Michigan physicians who provide clinical care.
6	Hamberg K *et al.* 2002. Sweden	To investigate differences due to gender in diagnosis and management of neck pain.	National examination for 239 Swedish interns.
7	Hirsh, A.T. et al. 2014. USA	Research suggests that the sex of the patient and provider as well as the sexist attitude of the provider interact to influence how pain is managed and cared for. Not many studies have examined these influences.	Analogue research design. 98 health care providers (52% female) and 16 computer-simulated patients.
8	Hollingshead NA et al. 2015. USA	To examine how patient´s demographic characteristics influences the healthcare providers decisions on treatment and providers awareness of this phenomenon.	Virtual online study consisting of 20 medical trainees and 16 patients. Followed by individual interviews.

9	Naamany, E. et al 2019. Israel	To examine the administration and management of analgesics by the medical/ paramedical staff in relation to the patient's gender, and thereby to examine the extent of gender discrimination in treating pain	Single-centre retrospective cohort study. 824 patients participated in total. 414 women and 410 men
10	Schäfer, G. et al. 2016. United Kingdom	To investigate the impact of high or low trustworthiness, a rapid and automatic decision made about another, and of gender and depression history on judgements of the level of pain made by pain clinicians and by medical students.	Using an online survey platform, each participant was exposed to 12 different vignettes and corresponding videos concerning patients with chronic pain. The dependent variables were participants' estimations of pain; estimations of the probability that patients were exaggerating, minimizing, or hiding their pain; and treatment choices. This study had a total number of 63 participants.
11	Zhang, L. et al. 2021, USA	To study the impact of perceived patient sex on perceivers' pain estimates and treatment recommendations	Experiment 1 (N = 50) 30 female and 20 male, perceivers Experiment 2 (N = 200)

Appendix 2. Table 3. Phrases and Categories

Original Phrase	Reduction	Category	Sub-Category
They were more likely to provide optimal treatment for men with acute postoperative or cancer pain. (1)	Men were more likely to be treated for acute post op. and cancer pain. (1)	**Further treatment decisions**	Pharmacological treatment
Analgesia was administered to 62% of the study group. Compared to men, women had a similar mean pain score (6.7 vs. 6.5; p = 0.3), but were less likely to receive any analgesia (60% vs. 67%, difference 7%, 95% CI = 1.1% to 13.6%) and less likely to receive opiates (45% vs. 56%, difference 11%, 95% CI = 4.1% to 17.1%).	With a similar pain score to men, women were less likely to be given analgesia. (2)	**Further treatment decisions**	Pharmacological treatment
	Women were less likely to receive opioid medication than men were. (2)	**Further treatment decisions**	Pharmacological treatment
	Gender discrepancy in opiate analgesia was present in patients under 50 years old (2)	**Further treatment decisions**	Pharmacological treatment
The gender disparity in receipt of opioid analgesia persisted when gender-specific diagnoses were excluded and when stratified by age (Table 2). Specifically, in patients younger than 50 years, women were less likely to receive opiates than men, but this difference was not observed in patients older than 50 years.	Out of the patients that needed surgical procedures for their abdominal pain less of women were given opioid analgesia than men. (2)	**Further treatment decisions**	Pharmacological treatment
	likelihood of women was less than men to receive opioid analgesia for pain. (2)	**Further treatment decisions**	Pharmacological treatment
	Women had to wait 15-16 minutes longer to receive medication for pain than men did. (2)	**Further treatment decisions**	Delayed waiting time until treatment
In addition, the gender of the treating physician failed to show any difference			

from the gender disparity identified for the entire cohort Finally, 80 (8%) patients underwent surgical treatment of their abdominal pain, of which 50% were women. Of the 40 female surgical patients, 25 (62%) received opioid analgesia, compared to 31 (78%) male surgical patients ($p = 0.22$). A comparison of the characteristics of female and male patients elucidated several potential confounders, specifically age, race, pain score, and triage class. Logistic regression with clustering on physicians demonstrated that men, older patients, patients of non–African American race, and patients with higher pain scores and triage acuity were more likely to receive opioid analgesia (Table 3). However, only higher pain score and triage acuity were associated with an increased likelihood of receiving any analgesic treatment (Table 3). After stratifying on these variables using the summary Mantel-Haenszel risk ratios, women were still 13%–25% less likely			

than men to receive opioid analgesia. Analysis of time to analgesia showed that women waited longer for their pain medications than men (median time 65 minutes vs. 49 minutes, difference 16 minutes, 95% CI = 3.5 to 33 minutes), particularly for opiates (63 minutes vs. 48 minutes, difference 15 minutes, 95% CI = 3 to 33 minutes). (2)			
Nevertheless, complementary exams in emergency (ECG and troponins/CK) were asked a little more frequently for men than for women (30.6% vs 26.9%, p = 0.29), without a significant difference. (3) men were 2–3 times more likely to be referred for consultation to a cardiologist compared to women (53 men (16.6%) vs 26 women (7.4%) (3) there was a tendency toward less investigations for women (ergometry, Holter, echocardiography and scintigraphy/coronarography) (3) In multivariable-adjusted analyses, after	Complementary exams (ECG and troponins) were asked more frequently for men than for women. (3) Men were more likely to be referred for consultation to a cardiologist. (3) Tendency towards less investigations for women. (3) After adjustment for the patients age and cardiovascular risk factors, men were still more likely to be referred to a cardiologist. (3) Male physicians were less likely to refer female patients to cardiologists than women physicians. (3)	**Further treatment decisions** **Further treatment decisions** **Further treatment decisions** **Further treatment decisions** **Further treatment decisions**	Referrals for testing Referrals for testing Referrals for testing Referrals for testing Referrals for testing Referrals for testing

adjustment for patients' age and cardiovascular risk factors, men were still two times more likely to be referred to a cardiologist compared to women (OR: 2.30, 95% CI: 1.37–3.86). (3) men physicians tended to refer less women patients to cardiologists than women physicians (3) the association between a patient's sex and referral to a cardiologist was not explained by chest pain presentation, clinical signs, or the physician's characteristics (3)	the association between a patient's sex and referral to a cardiologist was not explained by chest pain presentation, clinical signs, or the physician's characteristics (3)	**Further treatment decisions**	
As shown in Table 2, in analyses of variance there was not a significant difference between males and females in worst pain scores, least pain scores, or pain interference on the BPI-SF, but females reported significantly higher scores for average pain in the last week and pain right now (*P*-values <0.05). (4) Table 3 presents data on analgesic medications. The mean total daily morphine equivalent dose for the sample was	Males had higher average of total daily dose of morphine than females (4) Females were less likely to be taking high potency opioids (4) Females were more likely to report inadequate pain management (4)	**Further treatment decisions** **Further treatment decisions** **Underestimation of womens pain**	Pharmacological treatment Pharmacological treatment Estimation of pain

89.89±156.64 mg. In analysis of variance, the mean total daily dose was significantly greater for males than for females (*P*=0.03). No other demographic or clinical characteristics were associated with the mean total daily dose. (4) Types of medications prescribed were not mutually exclusive in that patients may have been taking more than one type of pain medication. Thirty-five percent were taking no opioids. As shown in Table 3, in Chi-square analysis, females were significantly less likely than males to be taking high potency opioids (*P*=0.02). With respect to other demographic and clinical characteristics, compared to patients with more education, patients with less education were more likely to be taking low potency opioids (*P*=0.009). Type of treatment and disease stage were not associated with the types of analgesic medications being taken by the sample. (4) PMI scores for the sample ranged from			

−3 to +2 (see Table 4). Nearly half of the sample (46.5%) had PMI scores less than 0. Among those patients reporting adequate pain management, the vast majority (78.6%) had PMI scores equal to 0. Using the nonparametric Mann–Whitney *U* test, females were significantly more likely than males to report inadequate pain management on the ordinal level PMI (*P*=0.04), and in logistic regression, there was a significant sex effect (*P*=0.005) even after controlling for age, marital status, income, and time since diagnosis. (4)			
When comparing the use of common drug treatments for CAD, women were significantly less likely than men to receive statins (118 [78.1%] vs 139 [90.8%], respectively; P = 0.003) (5) After adjusting for clinical characteristics, women were also found to be less likely than men to receive aspirin (5)	Women were less likely to receive statins. (5) Women were less likely to receive aspirin. (5)	**Further treatment decisions** **Further treatment decisions**	Pharmacological treatment Pharmacological treatment
Regarding investigations and treatments, laboratory tests were suggested more often in the male case (6)	Laboratory tests were suggested more often in the male case. (6)	**Further treatment decisions** **Underestimation of women's pain**	Referrals for testing Gender influenced trustworthiness of experienced pain

men proposed more well-defined diagnoses in the male case and more nonspecific symptom and psychosocial diagnoses in the female case. (6) both male and female physicians ordered laboratory tests to a larger extent in the male case (6)	Men proposed more well-defined diagnoses in the male case. (6) Men proposed more nonspecific symptom and psychosocial diagnoses in the female case. (6) both male and female physicians ordered laboratory tests to a larger extent in the male case (6)	**Underestimation of women's pain** **Further treatment decisions**	Gender influenced trustworthiness of experienced pain Referrals for testing